From Matter to Urban Politics

Confronting the Grand Paris Urban Project to the Seine River Basin

Toward Reparative Ecologies in the Riverine Territory

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Transitional Territories Graduation Studio

2020-21

TU Delft

Colophon

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I would like to thank the TT family for the support throughout the academic and personal hardships that have marked this year. While we did not meet many times in person due to the unique epoch we are in, we struggled and triumphed as a group.

A special thanks to the friends I made at BK who have provided motivation and the possibility of release throughout the first part of the thesis process. And to the ones I made through prior lives - friends become family when reunions after crossing oceans feel like no time has passed.

Of course, the success of this year would not have been possible without the unconditional love of my mother and sister. Thank you both for being with me during my lows, we can now share the highs.

Finally, a special dedication to my father - même si tu n' es plus là, tu l' es - you would have been proud of me right now.

The thesis year was marked by intense academic and personal struggles, but as it comes to an end, I will continue to move forward, towards better: 'Ad Meliora' .

Tectonic breccia, Lez River Valley,
James St. John (2014)

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ABSTRACT

Key Words: Urban development, Territorial dynamics, Anthropogenic matter, Urban politics, Reparative design

The Parisian urban region is currently experiencing Europe' s largest urban redevelopment to project the city beyond its historic boundaries and into the 21st century: a decade-long urban restructuring centered around the creation of a 200 km rail mobility network (the Grand Paris Express). This inevitable urban transformation is restructuring spatial, socio-political, and cultural relations between the urban center and the periphery but is also considerably affecting the ecological functioning of the larger riverine territory of the Seine Basin from which it depends on.

This thesis investigates the ecological, geological, hydrological consequences of material extraction needed to construct the Parisian Urban Project looking most notably at sand and aggregate quarries used in the production of concrete. While this graduation project does not look to offer an alternative to extractivism, it looks at applying a material practice of repair on damaged and post-extraction landscapes as to mend for past destructive actions.

This project first constitutes a joint narrative between the urban project of the Grand Paris and the territorial project of the Seine watershed. This relational outlook is intended to form nonlinear and dynamic links between the urban and the territorial, land and water, and culture and matter to uncover the uneven and exploitative practices occurring in and around the river system.

This project then follows urban matter - materials associated with the construction of the urban - through a forensic exploration, associating socio-cultural crisis with political and economic agendas and their physical manifestation beyond the conventional urban boundaries, looking at cultural and physical forces applied on geologies and the processes of de/re territorialization of matter.

Finally, this thesis formulates a territorial vision embedding a new material cycle in the Seine River Basin and proposing a design intervention towards repair in La Bassée, the last remaining upstream wetland. This vision provides a dual social and ecological rehabilitation towards a multi-species riverine landscape adapted to instabilities of the New Climatic Regime.

The true origins of a building is underground: it is the extraction of natural resources, the geology that lies below our feet that forms the city.

Lara Almarcegui in conversation with Gerd Wessolek, Wastelands (2017)

Les Terres du Grand Paris
Anne-Marie Filaire (2020)

MOTIVATION

This project begins with a will to reconnect with the city I spent my youth in. Paris is associated with my first memories of space. Playful experiences linked to the innocence of childhood in a setting that, at the time, surpassed my understanding of its history. Urban processes which shape our environment have long felt ungraspable. Yet their effects perceived at the scale of the site and through the everyday. In my teens, my school was located near a site of ruins. A former factory, which had long been demolished, had left a few supporting walls standing on a plane where a unique, un-manicured ecology had settled. A staircase leading to a non-place become another place of playful interaction from which to view the mystical vistas of the urban. From childhood and hard ship comes growth in the ruins. The building, its construction, life span, impact on the everyday and demise became of particular interest to me. The indescribable energy that is felt in a space of disconnect, deserted of its primary program, erased from the productive urban system, and reconquered by the hazards of life is one I wish to encapsulate in this project. Surpassing the conventional understand of the urban space has long been a leitmotif in my personal and academic course. This project hopes to become a reflection of personal identity and professional growth.

Screenshots from Pruitt Igoe Falls
Cyprien Gaillard (2009)

01 INTRODUCTION

01 INTRODUCTION
01.01 POSITIONING

Anthropocene

This research begins with the understanding that we have entered a new geological epoch - one dictated by human activities, following an economic and political rational, subjecting local realities to global forces. This epoch, although not yet officially recognized by the International Commission on Stratigraphy, is marked by the intensifying transformative anthropogenic activities and the rise of the atomic and nuclear age. Since the 1950s the world has experienced an exponential rise in both socio-economic and earth system trends. Growth in Population, Growth-Domestic Product Value (GDP), and Chemical Fertilizer consumption are only some of the indicators illustrating this rise. As a result to these trends, Earth Systems have been significantly altered with an exponential rise of atmospheric Carbon Dioxide, deforestation, and surface temperature. This period is known as the “Great Acceleration.” The Anthropocene – corelated to this exponential acceleration – illustrate the positions of anthropogenic system as a dominant force in shaping landscapes and their ecology.

Anthropogenic Grounds of the Critical Zone
Observatories for Earthly Politics (2020)

Last 4 billion years

$$\frac{dE}{dt} = f(A,G,I)$$

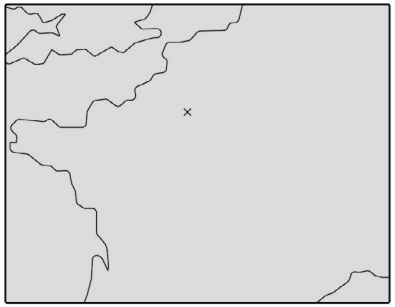
Last 60 years

$$\frac{dE}{dt} = f(H)$$

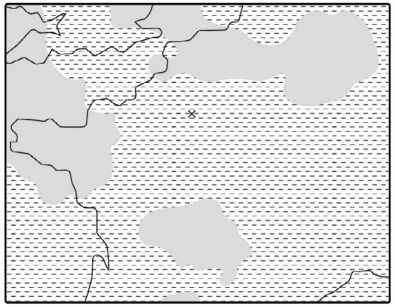
$$A,G,I \rightarrow 0$$

t = time
E = Earth system
A = Astronomical forces
G = Geosphysical forces
I = Internal dynamics
H = Industrialised societies

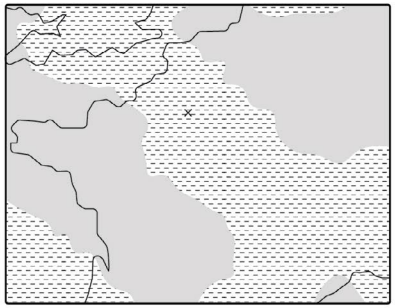
The Anthropocene Equation
Gaffney and Steffen (2017)



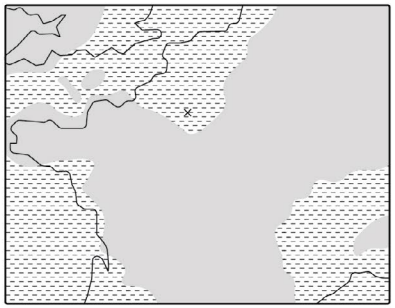
Triassic - 240 Myr (0:00)



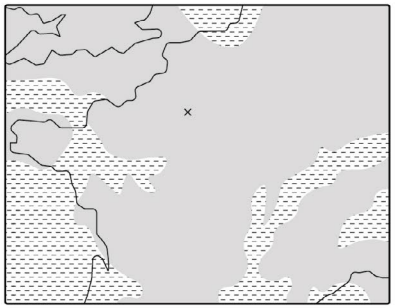
Jurassic - 200 Myr (4:00)



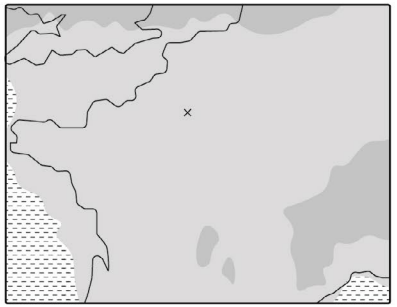
Cretaceous - 135 Myr (10:30)



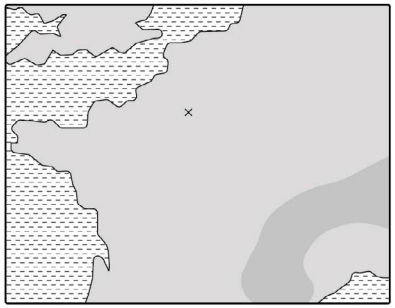
Paleogene - 65 Myr (17:30)



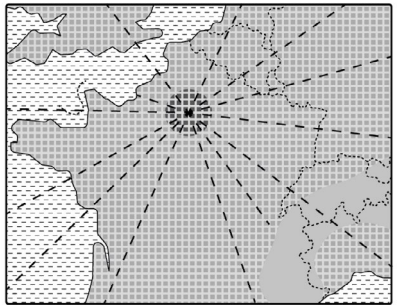
Neogene - 23 Myr (22:00)



Quaternary - 1.65 Myr (23:54)



Holocene - 11.8 Kyr (23:59)



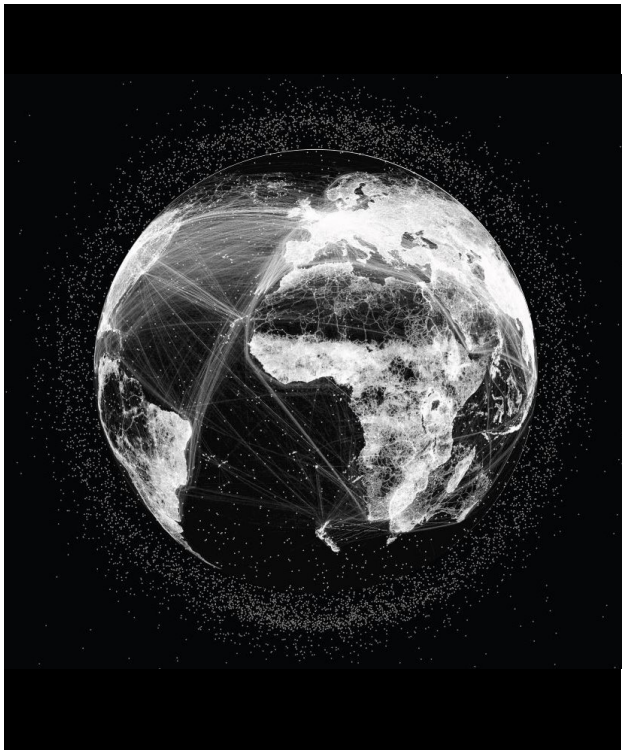
Antropocene - 75 yr (23:59:59)

Evolution of the Parisian Geological Basin,
Hadrien Cassan (2020), ANDRA / BRGM (1994)

01 INTRODUCTION
01.01 POSITIONING

Anthropogenic Territorialization

The era of the Anthropocene is a consequence of multiple processes of landscape transformations, nuclear pollution, and green house gas emissions. This phase can also be characterized as the consequence of anthropogenic territorialization – in which ruling classes, through history, have changed and altered the landscape to achieve specific societal, political, and economic goals (Scott, 1998). The act of territorialization created an artificially "distinctive, bounded, measurable, and communicable" environment that facilitated control and management of the land (Murphy, 2012). Anthropogenic territorialization has historically super-imposed human needs onto the landscape, with limited holistic understanding of the larger ecological and climatic repercussions these actions had on vital bio-spheric systems. By doing so, humans have become integral parts of shaping the Earth.



Planetary Urbanization
Brenner & Schmid (2012)

Planetary Urbanization

The scale of anthropogenic territorialization – has led to the current global state characterized by Brenner and Schmid (2012) as 'Planetary Urbanization.' This theory derives from the understanding that human impacts extend much farther than the visually conceived spaces of habitation, outward in the atmosphere, deep in the ocean bed... Brenner and Schmid have outlined four key theoretical arguments to prove this planetary urbanization; two of which seem of particular importance to state. (1) First, the understanding that most lands have been functionalized, therefore altered to provide a specific benefit to urban society. In this sense, humans have operationalized landscapes – transforming them in service of urban centers and towards anthropogenic needs. (2) Second, that all lands historically deemed as "wilderness" have been reached with repercussions from urbanization process. For example, the authors suppose that all land have been meet with particles of air pollution steaming from urban habitation (Brenner & Schmid, 2012).

Cartesian Thinking: Land of Artifice

The French philosopher, Rene Descartes, argued that a separation between humans and their environment allowed for a status of “masters and possessors of nature,” to which an application of “rational analysis and technological control” would allow human prosperity (René Descartes as cited by Whiteside, 2002, p.2). Cartesian Dualism has since allowed the geometric reconfiguration of landscapes as a way to promote understanding and allow a particular productivity (Hatfield, 2014). Jacob, one of the driving forces of the French environmental movement of the end of 20th century, has strongly argued that this distinction has influenced spatial perception and led to the creation of the western anthropogenic landscape, one of heavily modified land-use, desynchronized temporal ecological processes, and artifice: a landscape geared towards economic production over all else (Whiteside, 2002 ; Jacob, 1999). This control and transformation of natural environments for human production – that is the transformation of ‘natural lands’ into crop fields, industrial sites, urban settlements… – has erased fundamental connections between man and the inherent ecology of landscapes.

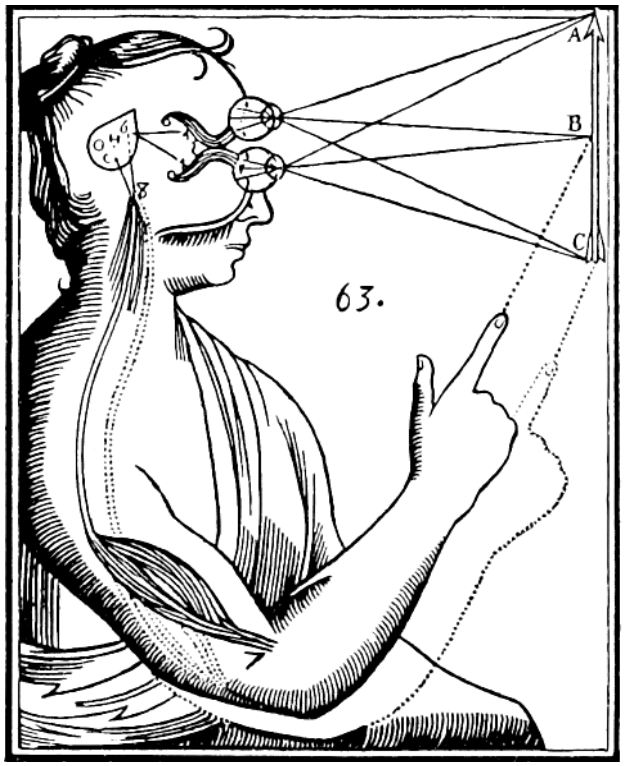


Diagram of Cartesian Logic
source unknown

Damaged Nature

This notion has come to describe the current ecological state of the planet. This notion speaks of disturbed and disconnected natural processes due to urbanization and other anthropogenic intrusion in the environment. The acts of anthropogenic territorialization and planetary urbanism are the main cause for this broken nature due to the imposition of an external control which follows a limited human-logic rational. Interventions in the landscapes have often been done at the cost of the uncapitalizable. The result of anthropogenic growth, replacement, and interconnectedness - is a fragmented residual, diminished in quality and subtraction of value. The realization of the current state of this shattered environment calls for reparation.

01 INTRODUCTION
01.01 POSITIONING

Anthropogenic Matter

In 2020, a scientific report was released announcing that anthropogenic-mass had now equaled and would soon surpass the weight of all bio-mass on Earth (Elhacham et al., 2020). The authors define anthropogenic mass as “the mass embedded in inanimate solid objects made by humans (that have not yet been demolished or taken out of service).” The research therefore illustrates the planetary extend of visible anthropogenic matter, primarily constituted of concrete and aggregates for habitat building. Similarly, Geologist Jan Zalasiewicz, in his presentation of the critical zone in the eponymous exhibition presented in 2020 at the Center for Art and Media Karlsruhe in Germany, explains his modeling of the composition of the cubic meter of the Critical Zone. In this holistic synthesis proposal, Zalasiewicz states that of that square meter half of it would be ‘urban mass’ – derived from building materials, roads, debris, soils… Concrete would be a predominant element represented by a 2 mm layer of this cube (ZKM Karlsruhe, 2020). The age of industrial processing has used natural composites to create new associations to produce objects of varying cultural importance. From this, we can assert that anthropogenic matter, human-altered materials dissociable in use and location now compose a layer of the Earth’ s strata.

10 billion tons

of concrete produced globally each year

3rd

largest CO_2 emitter

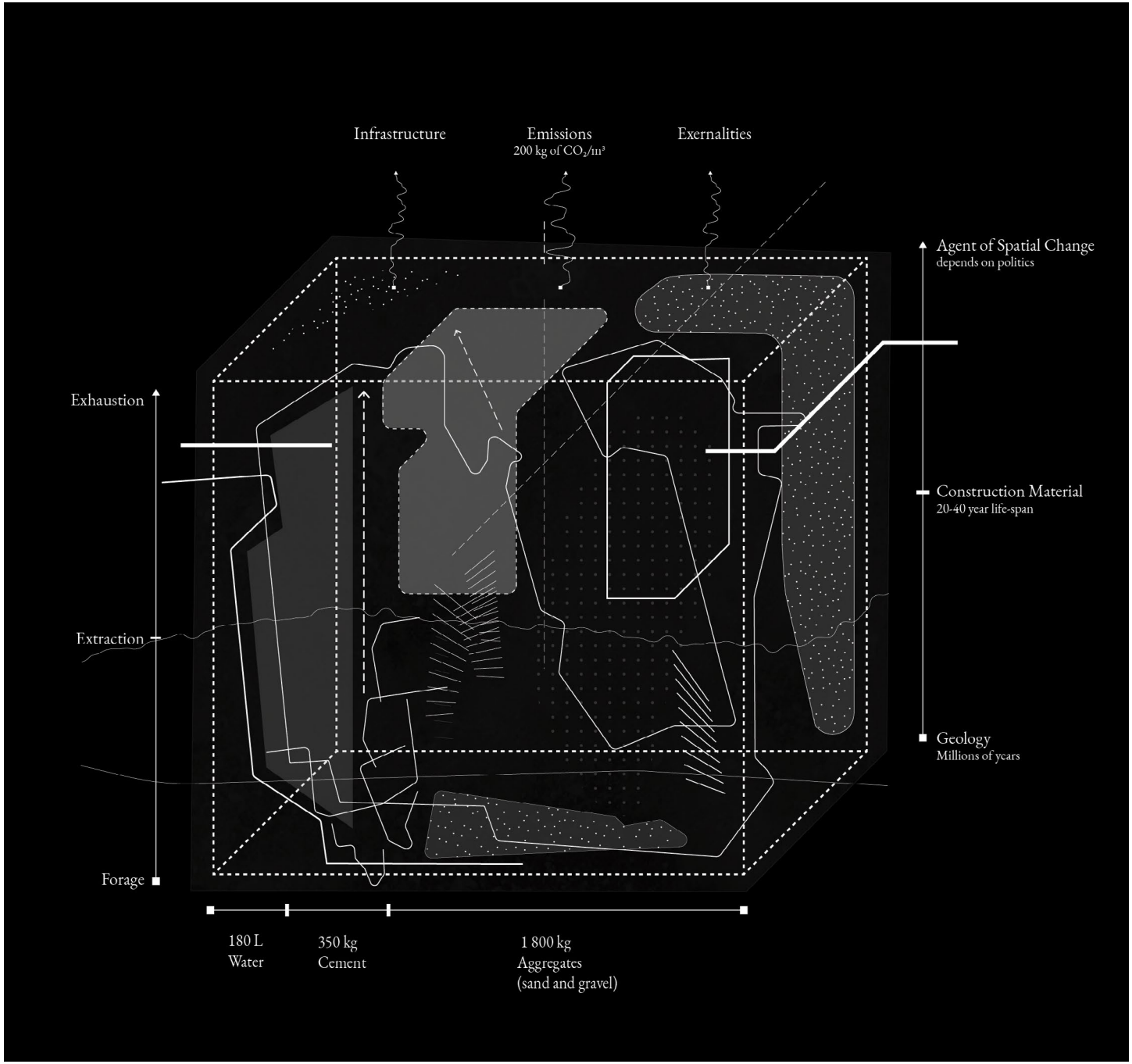
billion €

construction industry

50-70 year

life span
(composed of million-year-old sediments)

Gravel
Lara Almarcegui (2018)



Urban Matter
Hadrien Cassan (2021)

01 INTRODUCTION
01.02 LOCATION

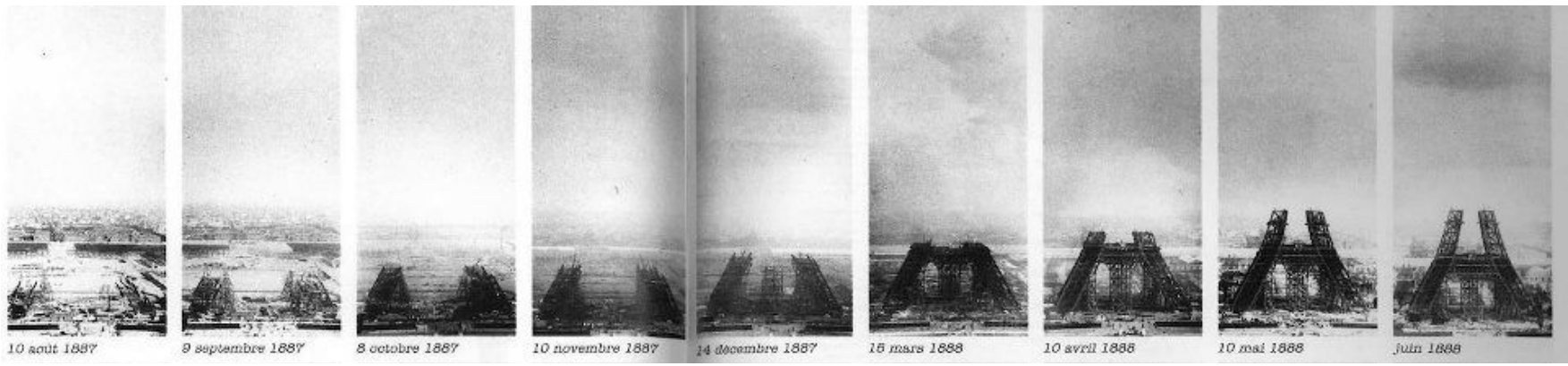
The Urban : Paris

Paris is the capital and the largest city in France. Today, the Parisian Metropolitan Region is the most populated urban region of Europe generating the highest yearly GDP. While the city of Paris is inhabited by over 2 million people, there are close to 12 million inhabitants in the extended urban region. This region is composed of a multitude of cities which over time have seemingly merged to create an urban conglomerate. In response to this continuous and co-dependent urban system and to project the region into the 21st Century, the Region of Ile-de-France is currently undergoing the largest urban re-territorialization project of Europe - to soften historic boundaries and create a unified urban area: the Grand Paris.

The Riverine : La Seine

The city is located significantly inland - about 160 kms from the Sea - but is established along the banks of the River Seine - which flows East to West. The river takes source near Dijon in Burgundy meanders through the city of Paris and flows into the English Channel at Le Havre. The Seine is a 775 km long fluvial channel - part of a larger hydrological system: the Seine-River-Basin with three main tributaries: the Yonne, the Marne and the Oise.

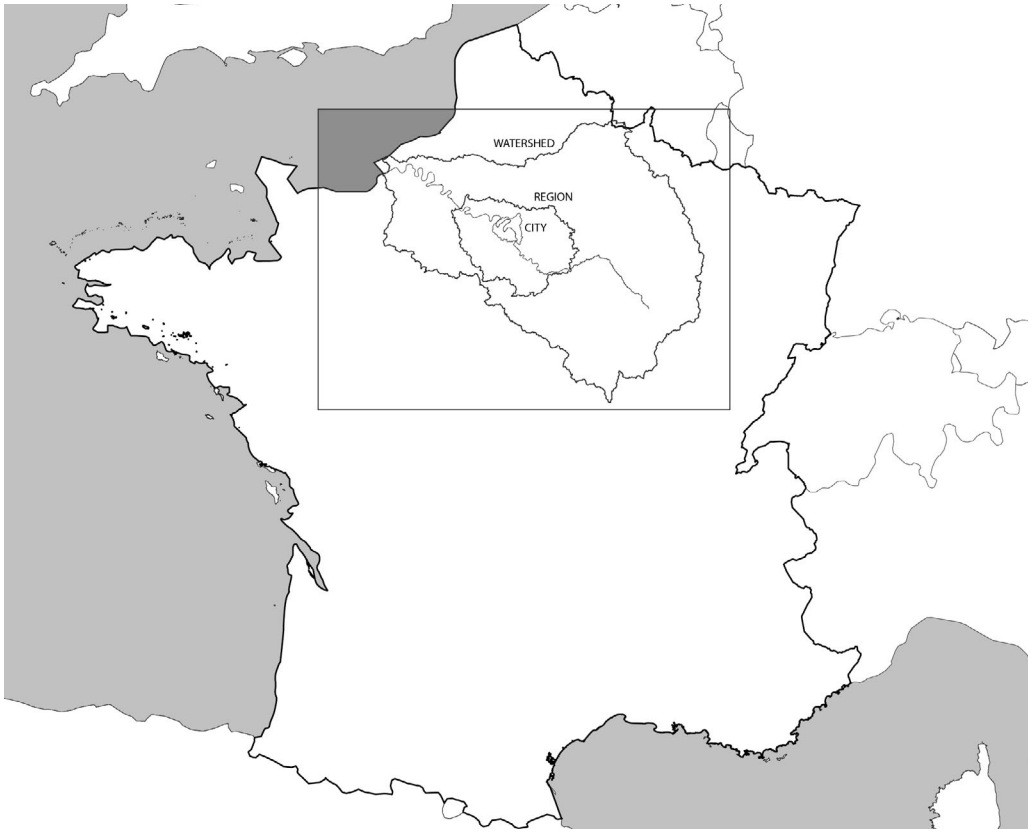
The Construction of the Eiffel Tour
Théophile Féau (1887-1889)



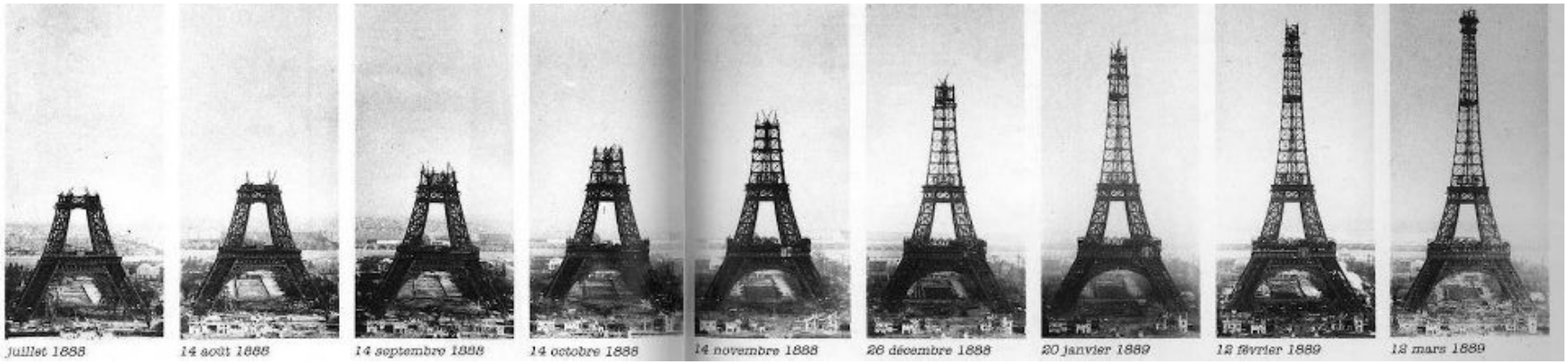
Fluctuat Nec Mergitur

Rocked by the waves but never sunk

Motto of the City of Paris



Research Location Map,
Hadrien Cassan (2020)

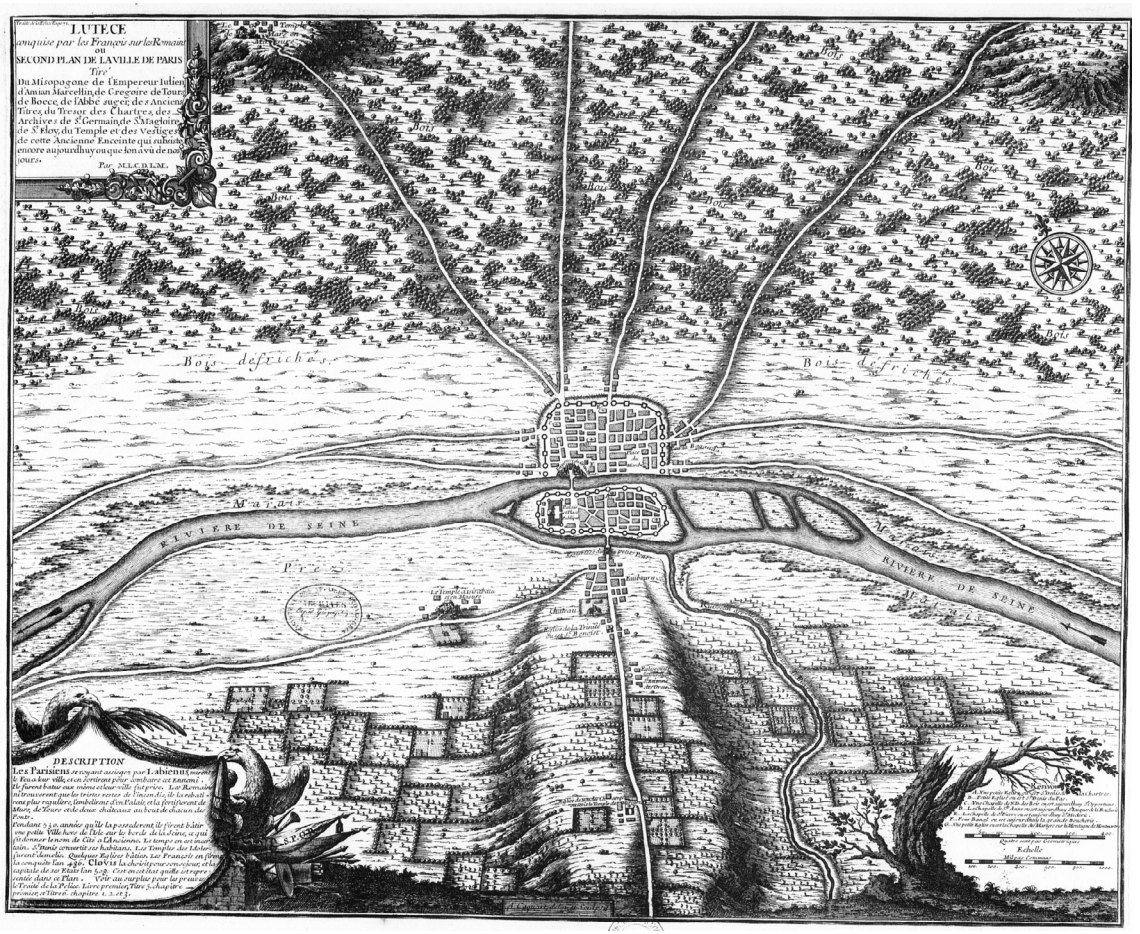


01 INTRODUCTION
01.01 LOCATION

The Historical Relationship

Historically, the river has been the reason for human settlements. In its origins and during the Iron Age and the Roman era, the Parisii, a Gallic tribe settled on the Ile-de-la-Cité, an island located in the middle of Seine River, in the center of common day Paris. This location served as a major trade route at the junction between land and water. The Roman' s quickly conquered the area and reinforced the settlement as a key trading hub strategically placed along a continental North-South axis and an East-West fluvial route. The river was named after Sequana, the Roman goddess whose name signifies flow and movement.

Paris' motto - Fluctuat Nec Mergitur, 'tossed by the waves but never sunk' - was attributed in the 16th century. It illustrates the close-knit-relationship the city has with the element water and proclaims its strength and resilient. While it has experienced historic changes, undergone sieges and occupations, traversed through wars and revolutions, seen floods and diseases, the city still stands tall and strong. In this project it is argued that Paris cannot be separated from its river and its watershed and that the water body is the primary driving force for the prosperity of the settlement. This location was chosen for this project because of the intrinsic interconnections between water and land, territory and city, and culture and landscape.



Paris (Lutèce) circa 508
Paris Lover (2018)

The Modern Relationship

Since then, the Seine River has been an integral part of Paris' development. The Seine, its watershed and fertile banks have been the conduit for maritime commercial trade as it connects to the North Sea at Le Havre, as a riverine infrastructure to transport vital construction materials, such as wood in the 17th Century and sand in the 20th, and as the city' s primary source of drinking water. As the quality of the water running through Paris was poor, the city, led by private and state actors, extracted and diverded springwater from the upper catchment area.

While the body of water has allowed for the establishement and prospirity of anthropogenic habitat, considerable stress, exploitation, and exhaustion are being experienced. Vast networks of infrastructure spanning the entire territory allow for the growth of the urban and the weakening of the territorial. This has led to the term, 'exterritorialities' as spaces in the hinterland become territories whose only function is to provide for urban need. In that sense, 'the river and its tributaries are (almost everywhere) urban in a functional sense" (Knoll, M. et al., 2017).

La Seine a Port-Marly, tas de sable
Alfred Sisley (1875)

La Seine at the Port Javel Bas, Lafarge Mirabeau
Hadrien Cassan (2021)

01 INTRODUCTION
01.03 CONTEXT

Ecological Disturbances

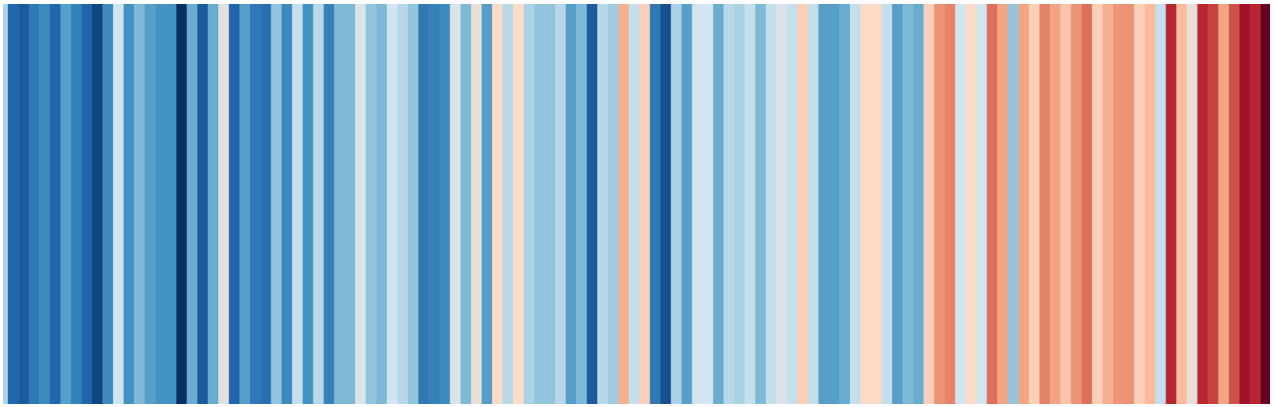
The World Meteorological Organization (WMO) has concluded that the last decade, 2011-2020 was the warmest ever recorded by weather stations. These indications foreshadow the future state of rising and increasingly fluctuating planetary temperatures.

While France is not particularly prone to ravaging and repeated catastrophic weather events such as hurricanes, tsunamis, earthquakes, the country has been faced with increasing and unpredictable disturbances which have rocked the thought-to-be stable French lifestyle. Rising summer temperatures, prolonged winter rain events, and biodiversity collapse are some of the main ecological catastrophes which are representative of the Seine River Basin. These processes have countless repercussions on population health, ecosystem prosperity, agricultural yields, and viability of vital infrastructural systems. These climatic fluctuations are in part due and accentuated by anthropogenic habitation of the landscape. Hegemonic urbanization synonymous of the city of Paris has greatly contributed to the artificialization of soils – which has affected riverine dynamics and accentuated heat island effects. Soaring Green House Gas emissions attributed to various types of terrestrial traffic are also a consequence of the increasingly concentration of inhabitants in cities. Land use changes, from forest to agricultural lands, have cut off key ecological corridors and depleted non-anthropogenic habitats – affecting the country' s biodiversity.

The climatic destabilization can be thought of a human crisis if individuals and societies are unable to adapt to changing conditions. The current and projected state of planetary bio-physical systems is demanding an adequate adaptation and transition toward new models of societal habitation of landscapes.

Gillet Jaune Protests
Dupont Lajoie (2018)

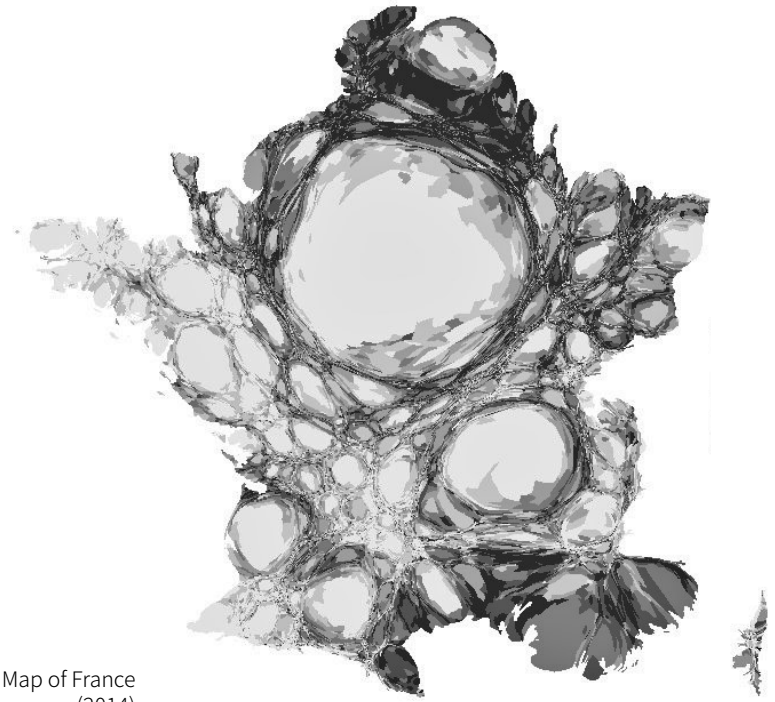
Average Yearly Temperature in Paris (1900-2020)
W. Cramer (2019)



Socio-Cultural and Identity Crisis

Paris is a historic site of socio-economic, cultural, and ethnic struggles. From the French Revolution of 1789 to the post-colonial mass housing projects, the urban space is embedded with layers of oppression, protests, and revolutions against the governing body. Today, history still echoes. In October of 2018, the Gillet Jaune (Yellow Vest) Movement 'sieged' the French Capital for numerous months, resulting in violent alterations between protesters and law enforcement. This struggle began around the imposition of a national energy tax, which was intended to desensitize automobile usage but was deemed particularly unfair for rural communities who depend on this mode of transportation. These protests erected throughout France denouncing Parisian-centered decision making from national political elites. This movement reinforced the increasing rural and urban divide and, most notably, the unbalance between the capital and the rest of the country. Centralism seems to be the key structural organization in the country. While it is said that 'all roads lead to Rome', in France, all roads certainly lead to Paris.

At the scale of the City of Paris, this centralism is also present. The historical boundary between the center and the periphery exemplified by the Peripheric Boulevard has segregated wealthier and immigrant communities since the 1950s. This spatial separation and the rise of post-war and post-colonial 'social-housing' in the periphery of the city center has furthered tensions between socio-economic classes and ethno-cultural backgrounds. An identity differencialism has risen dividing parisians from the center of Paris and non-parisians in the periphery. It must be said that singular identities and local pride have grown in cities in the peripherial areas in the last decades, most notably through art, music, and sports.



Anamorphic Political Map of France
(2014)

01 INTRODUCTION
01.02 CONTEXT

Le Grand Paris

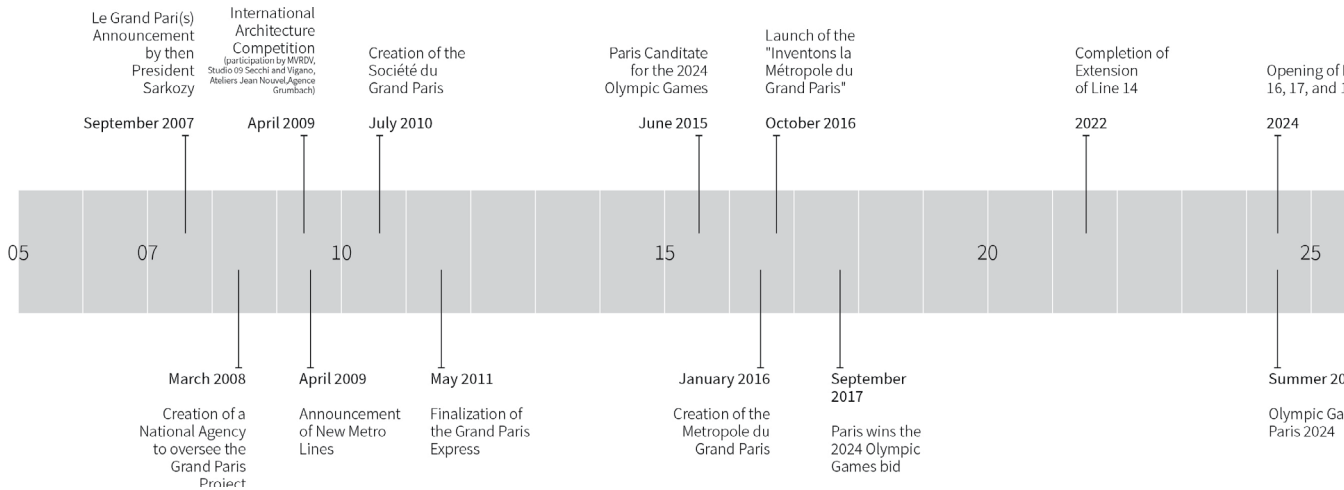
The Grand Paris project, which was initiated as an idea in 2007 by the former Presentient, was conceived to resolve local socio-economic inequalities - most notably between center and periphery - and (re)project the city of Paris as a global economic actor (Le Grand Paris, 2014). Since then, ecological ambitions were added to the project to respond to national demands linked to the COP 21 Agreements and aided by Socialist and Ecologist urban and regional governance. The backbone of this urban project lies on an addition to the public-transport system called the Grand Paris Express (GPE) - a 200-kilometer sub-surface ring which circles the City of Paris - connecting hubs within the Petite Ceinture. This additions to an already extensive rail network had various driving intensions. First, to counter act the pattern of centralization associated with the metro network - which served almost entirely to move people from peripheries to center. Second, to disenclave 'at-risk' neighborhoods which were cut off from economic opportunities and resulted in disastrous socio-economic repercussions. And finally, to connect the two major international airports of the city, Charles de Gaulle, and Orly (Grand Paris Express, 2017).

This mobility project serves as a driver for urban development on the surface - where new neighborhoods and construction are planned around the 68 new stations. These neighborhoods boast the potential for renewed economic activity and additional housing (with a high quota of 30% of 'low-income' housing) while integrating green spaces and vital social and cultural cohesion.

The urban project of the Grand Paris is one of large territorial scale and falls in the lineage of historic city-changing plans and developments initiated by the Baron Haussmann in the mid-1800s. At the time, sanitation, access to water and controlling urban uprisings were the main drivers of development. Today, the intentions have been updated: boosting economic activity and establishing the Parians urban region as a competitive mega region, disenclaving 'at risk' neighborhoods to response to precarious economic situations and promoting better quality of life through upgraded infrastructures, universal access to services, and additional green spaces.

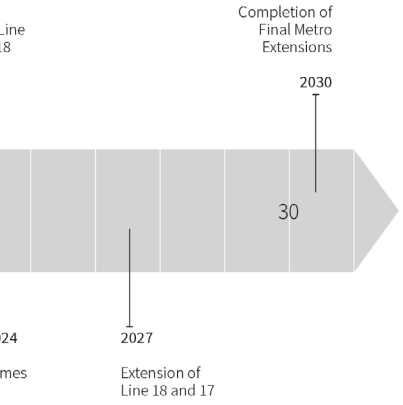
The Grand Paris project, the biggest project in recent decades, will transf century global metropolis. Paris has this scale since Baron Haussmann' s 1860s.

La Francaise, 2018

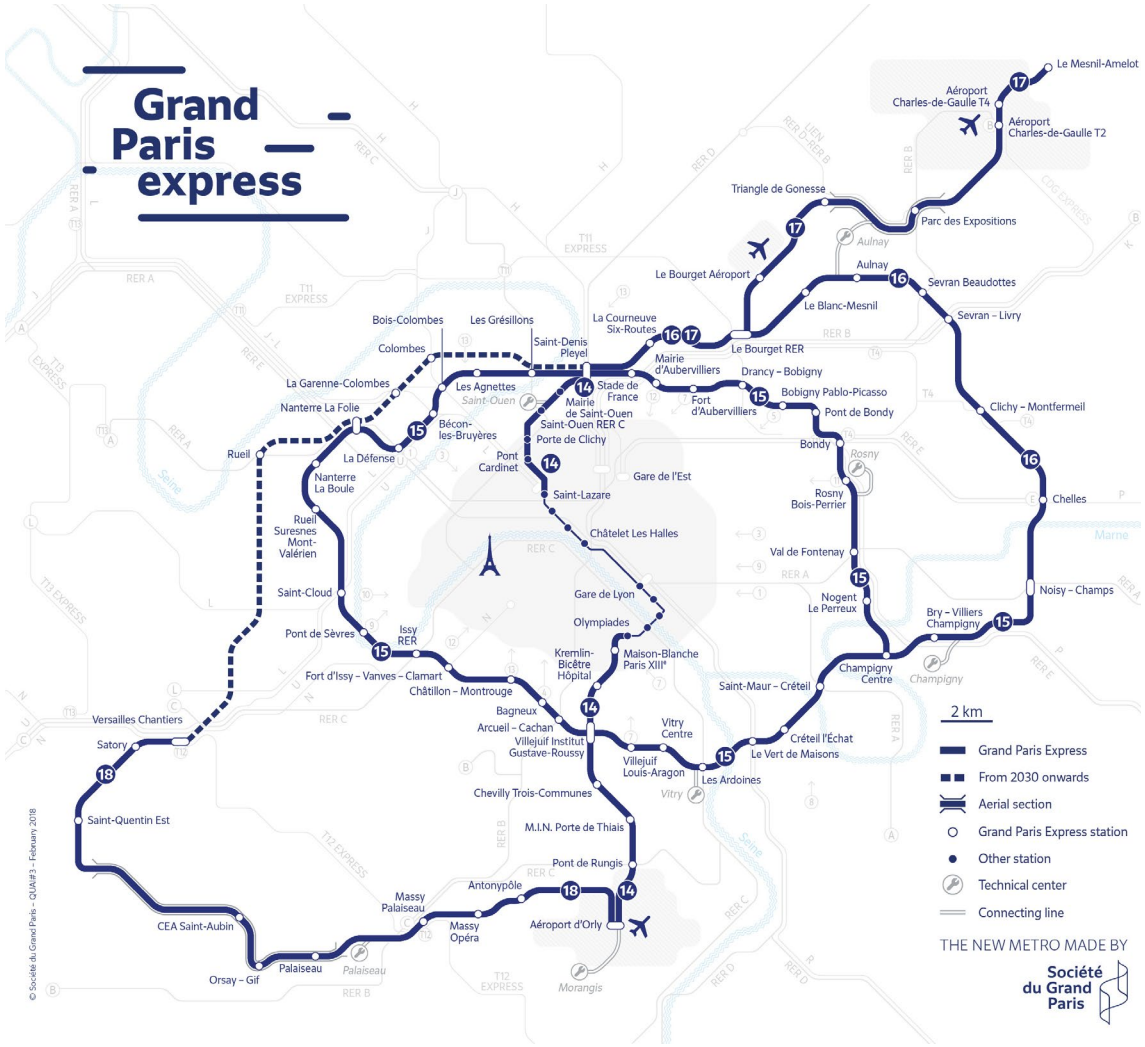


200 km	68	+ 70 000	€75 billion
automated metro system	new station neighborhoods	housing units (2020-30)	real estate investments

European urban development
form Paris into a genuine 21st
not experienced development of
urban renewal programme in the



Expected timeline of Grand Paris Express
Hadrien Cassan (2021)



Map of Grand Paris Express
Société du Grand Paris (2017)

01 INTRODUCTION
01.02 CONTEXT

Intended Outcomes of the Grand Paris

On a local scale

The urban project, which is driven by a large public mobility network - the Grand Paris Express - strives to connect the center of Paris to its enclaved peripheries, reduce income inequalities in the region, and boost local economies. This mobility corridor, currently in construction, will see new eco-neighborhoods pop up around the various stations along its course. These new urban hubs will serve in the regeneration of previously, deemed-degraded, post-industrial urban zones.

On a national scale

Conforming to the ecological crisis imperative, the urban project intends to drive national ambitions in creating more sustainable and resilient urban communities, while diminishing greenhouse gas emissions, decreasing urban impact on the natural environment, and promoting alternative urban lifestyles (integrate biodiversity into human-dominated environments, opening possibilities for smaller circuits of production and consumptions, and building net-zero or low-emissions structures).

On a continental/global scale

This urban project' s intensions are also grounded in the projection of the Parisian urban region on the international scale. As an economic actor, Paris is one of the rare continental settlements - creating barriers in its international exchange position. The Grand Paris mobility project is clearly geared at connecting the French capital' s three airports to various regional logistical hubs. While benefiting from a developed national railway network, the city is additionally looking at capitalizing on the fluvial connection of the Seine as a strategic economic and logistic axis. This will become one of the key elements in this thesis project. The Grand Paris project was also a considerable reason Paris was chosen to host the 2024 Olympic Games, which historically have promoted cities on the international stage. The city looks to affirm its image as a strong economic and sustainability hub by that time and project its future in the 21st Century.

Aujourd' hui, c' est encore d' un nouveau modèle urbanistique dont il s' agit sans que l' on interroge le postulat écologico-éthologique sur lequel il repose.

Gerard Baudin & Phillipe Genestier (2006)

Cranes over New Mix-Use Buildings
Olivier Boitet (2018)

“The politics of concrete are less divisive, but more corrosive. The main problem here is inertia. Once this material binds politicians, bureaucrats and construction companies, the resulting nexus is almost impossible to budge. Party leaders need the donations and kickbacks from building firms to get elected, state planners need more projects to maintain economic growth, and construction bosses need more contracts to keep money rolling in, staff employed and political influence high. Hence the self-perpetuating political enthusiasm for environmentally and socially dubious infrastructure projects and cement-fests like the Olympics, the World Cup and international exhibitions.”

Jonathan Watts (2019)

Urbanism as a Solution ?

There have been multiple critiques of this large-scale top-down urban project. The most vocally shared by spatial practitioner are the following:

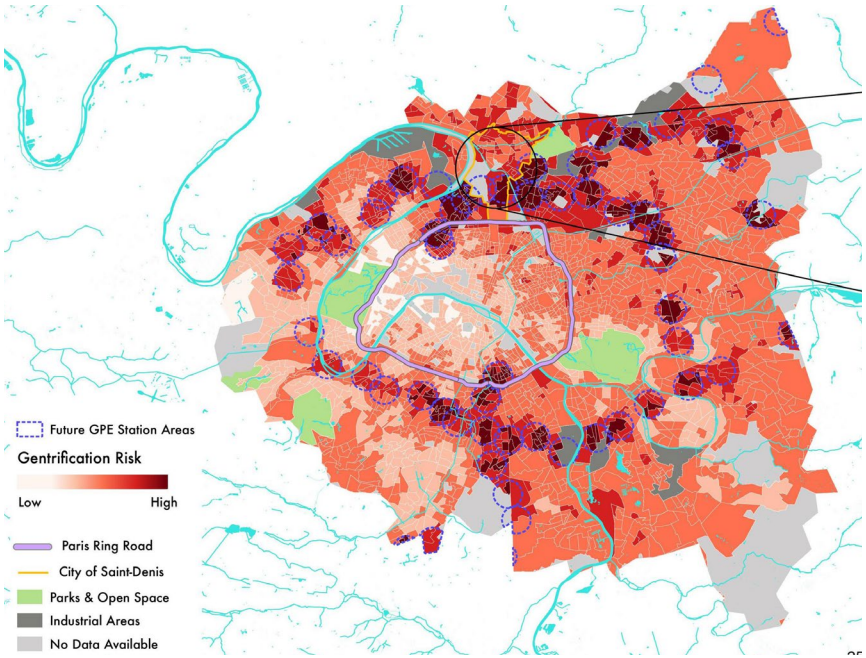
1. Questioning whether an ecological and social crisis can be solved through the process of building.

2. Questioning the financial drivers of this project and the application of top-down planning to address on the ground community needs.

3. Questioning the temporal aspect of the project - which is conducted under a strict timeline - corelated with the 2024 Olympic Games amongst other pressures.

4. Pointing out the high risks of gentrification that this project will create, driving vulnerable and low-income communities ever so away from the urban center.

5. And finally, questioning the resource intensive construction project that is both stimulating demolition and construction all around the city of Paris.



Gentrification Risk in the Grand Paris
Manon Vergerio (2018)

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02 PROBLEMATICS

01 Problem Field
02 Problem Statement

02 PROBLEMATICS
02.01 PROBLEM FIELD

Problem Field

Disconnect between urban processes and ecological cycles

The Grand Paris project is fully dependent on the modification of territorial processes such as extraction of resources (building materials…), movement of matter (water, goods…), and land use changes. These alterations of the landscape - essential to constructing the urban project - have detrimental environmental effects at various temporal scales. Resources are unable to be replenish at the scale of extraction. Environments cannot perform their normative ecological services and are unable to adapt to the scale of anthropogenic development. These pressures are contributing to bio-spheric and geo-morphological alterations which have accelerated the process of climate change - and puts human environments at greater risk of disturbance. This temporal dissonance is a primordial disconnect which needs conciliation.

Disconnect between society and environment

There is a perceptive gap between humans and the natural environment. The artificial urban landscapes created and inhabited is one factor which has separated humans from the larger ecological system we are a part of. This disconnect accentuates a disassociation between culture and ecology - causing us to overlook key environmental dynamics which are essential to ecological well-being and therefore human well-being. The transformation of landscapes for economic production has enabled multiplicity in functions and significantly altered environmental performance.

Disconnect between water and land, surface and subsurface

The interface between water and land has been minimized and perceived as a threat rather than an opportunity. This space of dynamic exchange between the two complimentary matters is a critical habitat zone for ecological development and geo-morphologic formation - and has been elementary in the establishment of human settlements. While being a source of challenges and disasters at times, riverine environments pose fewer threats to urban settlements than coastal environments do. There are opportunities in allowing a calibrated exchange between land, water, surface, and subsurface.

Anthropogenic Pressure on the Riverine Environment

Utilitarian Perspective of the River

Depleation of Resources

Location Specific Problematics

Today, we are looking at yet another urbanism model to solve issues that surpass the urban agenda, without questioning the ecological and ethological postulate on which it relies on (Baudin & Genestier, 2006). While the ambitions of the Grand Paris project are well placed, we must look beyond urbanistic solutions to resolve issues created by these very perspectives. Urbanization is the root of some key ecological disturbance outside the conventional urban boundaries.

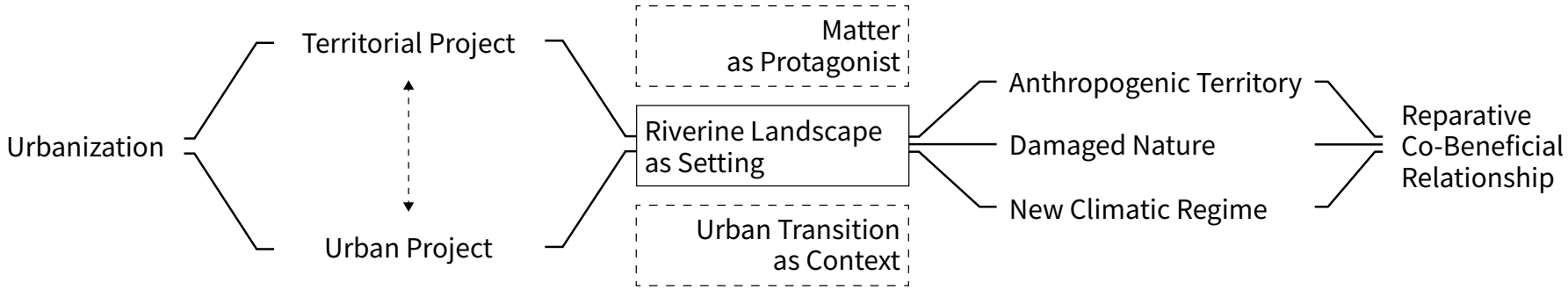
Urban development - influenced by economic, political, and social temporalities - comes at the cost of territorial ecological and geological cycles. The disconnect between the exponentially growing city and the sustenance of the territory it feeds off is impacting ecosystems and biodiversity and severely questioning the prosperity of the co-dependent landscape. This temporal dissonance is establishing long-term degrative relationships.

Paris is the anthropogenic spatial attractor of the region which is re defining embedded forces which occur in the landscape. The clash between embedded and applied forces on matter has long-term biological and atmospheric repercussions. This shock is transforming processes of sedimentation and diminishing landscapes function and quality.

The intend to build and dig - to extend the anthropogenic urban territory - has enormous physical and material consequences. Anthropogenic matter deriving from extraction, demolishing, and excavation have yet to be utilized in a constructive manor for both urban, geological, and ecological systems.

The urban transition of the Grand Paris demands a mobilization of the Seine River Basin - which functionally becomes geared towards the city. This urbanization process is affecting landscape dynamics, material movement, ecological cycles all along the Seine River Basin which will have long term repercussions ecologies and environments.

Project Taxonomy,
Hadrien Cassan (2021)



02 PROBLEMATICS
02.02 PROBLEM STATEMENT

Problem Focus

This research project will dive into the links between the Grand Paris and the Seine's riverine territory looking closely at the ongoing processes of urban development as they relate to matter: from de-territorialization (extraction) to re-territorialization (usage). The focus here will therefore be placed on the cultural perception of matter outlining the friction between applied and embedded forces, its politicization as its use relates to socio-economic and ethnic spatial realities in the city, and the creation of damaged post-extractivism landscapes associated with the construction of the urban project.

Problem Statement

Paris is currently experiencing the largest urban re-development in Europe. This urban project is not only modifying the relationship between the center and periphery of the city but has large implications beyond the urban and into the territorial – particularly the riverine territory of the Seine. The urban project of the Grand Paris demands a mobilization of the Seine River Basin – which functionally becomes geared towards the city. This urbanization process is affecting landscape dynamics, material movement, ecological cycles all along the Seine River Basin. The premise of the project lies in the disconnect between urban processes and ecological, geological, and hydrological riverine dynamics. This divide is accentuated by an increasing anthropogenic pressure on the river, a utilitarian perspective of matter, and a disregard for urban construction beyond the scale of the site. While the project of the Grand Paris has strong socio-ecological ambitions, the process of construction and transition is highly disturbing. It entails the extraction and movement of matter, the modification of landscapes, and the alteration of systemic functioning. The notion, effects, and repercussions of the anthropocentric territory will be questioned as it significantly alters ecologies and depletes environments of natural resources following political decisions towards a unilateral economic growth.

Proposition

While the creation of the urban usually entails the destruction of the territorial, this project proposes a co-beneficial construction process. Can residual spaces from material extraction become the steppingstone for renewed qualities of ecological and cultural landscapes? Can a forensic approach reveal missed opportunities in the construction process? Can urban political decision-making consider territories beyond their jurisdictions yet which they directly impact? Can linking co-temporalities serve as a generator for life-giving opportunities in post-Anthropocene landscapes? Can the creation of the urban be synonymous to the reparative development of the territorial?

In response to the inevitable Grand Paris project, a vision based on a sensitive material practice of care and repair must be thought out to integrate post-extraction landscapes into a larger functioning system: projecting not only the urban but the territorial into the disturbance-prone 21st century.

03 METHODOLOGY

03. METHODOLOGY
03. INTRODUCTION

This chapter uncovers the structural foundation of this Research and Design thesis project. This chapter forms a clear and concise backbone outlining the overall research, its theoretical and conceptual underpinning, and a step by step methodic explanation. Additionally, this chapter will define the analytical and design approaches, methods used to conduct the research, and state the expected outcomes.

In this chapter, the methodological steps of the research will not only be described but argued for as the most accurate for this specific project. While no methodology can be perfectly fitted, limits and shortcoming will be evoked, with hopes to fill gaps and further develop this chapter.

Largest European Underground Quarry in Paris
Didier Raux (2019)

03. METHODOLOGY
03.01 RESEARCH FRAMEWORK

This research begins from an interest in the visible and invisible processing of building the urban project. It focuses on the on-going large scale urban development project of the Grand Paris. The motivation lies both in a theoretical reflection on the cultural and political apparatus of urban development and the physical realities associated with visions to rewrite socio-spatial and environmental relationships and expand economic potential.

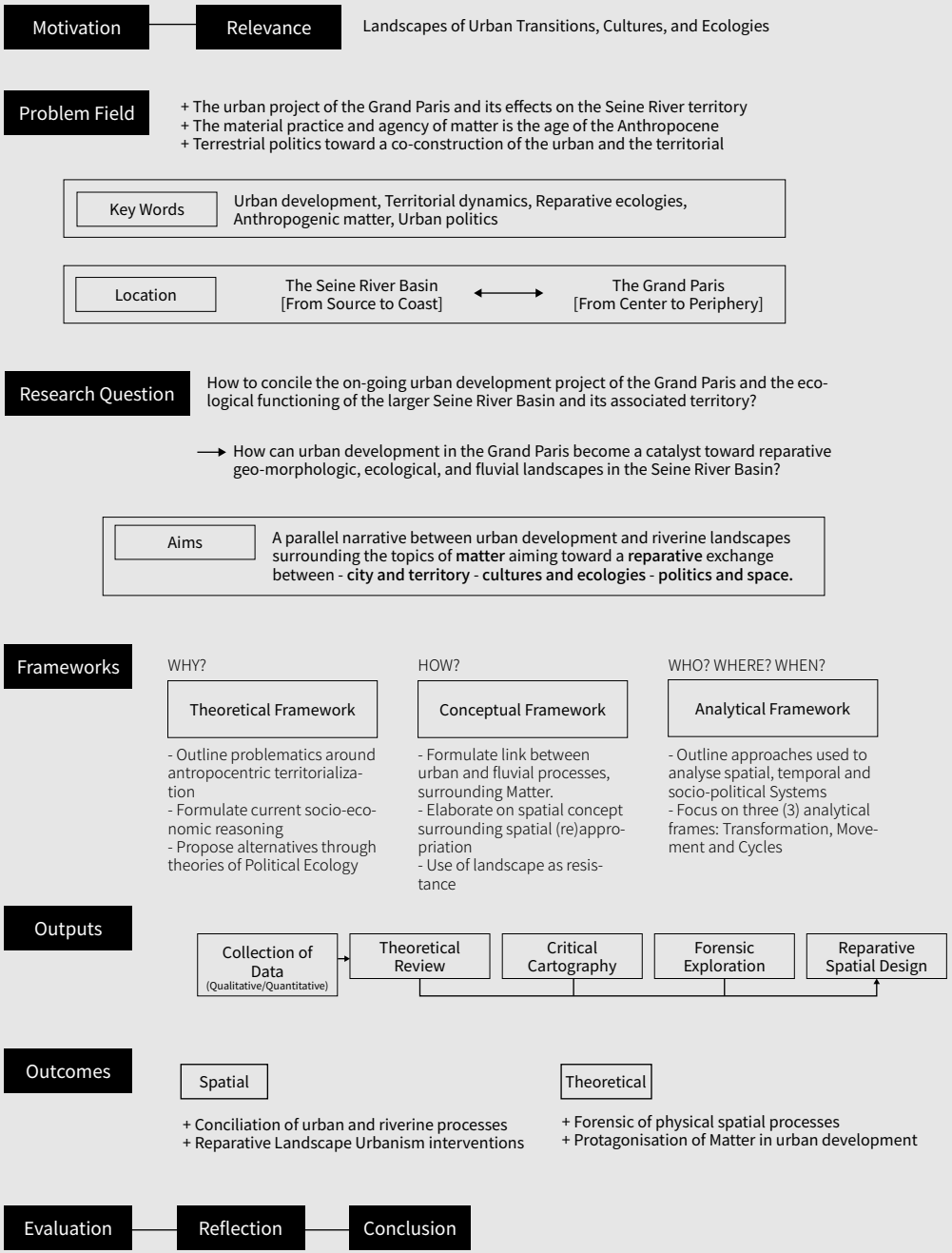
The project focuses on the entangled relationship between the Seine River Basin and the city of Paris and strives to deconstruct the effects of the urban project on the ecological and geological landscape of the riverine territory. This master' s thesis initial intension is to create parallel narratives between the Seine' s riverine territory and the urban reterritorialization of the Grand Paris – therefore linking ecological and fluvial process with urbanization dynamics and trends.

The initial questioning surrounded the societal and psychological disconnect between the urban and the territorial project which causes the prosperity of one over another.

The research dives deeper into the material reality of development of the Grand Paris and its detrimental effects on the Seine River Basin.

A dual spatial and theoretical exercise is conducted in this research with an aim to propose a reparative and co-constructive vision between the act of building the urban and cultivating the territorial.

Questions that have arose focus around: how to concile society and the environment, and urban change and ecological processes? How does human action on the landscape invoke societal relationship with the environment? How is the extraction, movement, modification, and politicization of matter an issue in ecological restitution?



Overall Research Framework
inpired by Balasubramanian (2018)
Hadrien Cassan (2021)

03. METHODOLOGY
03.02 RESEARCH QUESTIONS

The initial line of questioning looked at "How to align the inevitable urban development project of the Grand Paris and the multi-faceted Seine River Basin?" This question which strived to link urban development and the riverine territory's vital functions led to wonder how a co-constructive process could be put in place.

How can urban development in the Grand Paris become a catalyst toward reparative geo-morphologic, ecological, and fluvial landscapes in the Seine River Basin?

Following Marcuse's (2009) methodologic approach towards justice three actions are performed in this project. These actions translate into subquestions which form the basis for the outputs of this project.

Expose: The relationship between the Grand Paris and the Seine Territory and uncover a shared narrative.

Politicize: The use of matter as an agent of societal and environmental change.

Propose: A material practice based on care and repair to respond to damaged riverine landscapes associated with the construction of the urban project.

Problem Statement

Paris is currently experiencing the largest urban re-development of Europe. This urban project is not only modifying the relationship between the center and periphery of the city but has large implications beyond the urban and into the territorial – particularly the riverine territory of the Seine. The urban project of the Grand Paris demands a mobilization of the Seine River Basin – which functionally becomes geared towards the city, affecting landscape dynamics, material cyles, ecological systems all along the Seine River Basin.

Research Question

How can the **urban development** ofthe Grand Paris
become a **catalyst toward repair**
of the damaged geological, fluvial and ecological landscapes in the Seine River Basin?

Sub-Questions

Methods

1 **Expose** - To what extend is the urban project of the Grand Paris a territorial project in the Seine River basin?

+ Relational Analysis
+ Critical Representation

2 **Politicize** - How does matter become a physical agent for socio-cultural and ecological transformation? What externalities derive in the process?

+ Theoretical Review
+ Forensic Exploration

3 **Propose** - Can an alternative material practice based on care foster renewed qualities of life in damaged landscapes? What benefits derive in the process?

+ Conceptual Proposition
+ Spatial Design

Research Questions
Hadrien Cassan (2021)
inpired by Balasubramanian (2018)

03. METHODOLOGY
03.03 AIMS AND OUTPUTS

The initial aim of this research is to gain a better understanding of the processes of urban development occurring today and for the next decade in Paris. The design portion of this project looks to offer a landscape urbanism perspective on this inevitable urban project to repair the riverine territory it draws from - using the geomorphological composition to create renewed fertility in damaged landscapes.

Intertwine Narrative between City and River

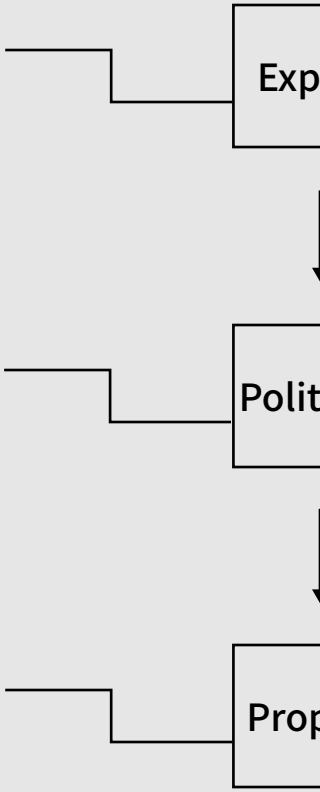
Formulate a parallel narrative between the expansion of the city of Paris and the development of the riverine territory of the Seine. This relational dialogue between city and river, land and water, matter and culture creates a primordial basis to form a territorial understanding of the dynamics of urban development.

Analyse Relationship between Matter and Urban Politics

Establish a conceptual and physical framework on the actions taken along the Seine, most notably relating to material extraction for construction, their intents, and their physical outcomes in the city.

Offer an Alternative Material Practice

Propose a material practice based on principles to repair and heal the riverine territory. Use (urban) matter as the driving element for design, integrate the new layers in the landscape offering new possibilities for ecosystem development, biodiversity, and cultural celebration.



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An Atlas of Critical Cartography

This atlas serves as the initial analytical entry point in this project - from which to create a dual narrative between the urban region and the river basin. It will be structures around the four (4) lines of inquiry of the Transitional Territory Studio - reflecting a holistic approach to understanding how the urban project is a territorial project

A Forensic Exploration

This analysis allows a spatial understanding of externalities attributed to urban development processes. From movement of material to movement of communities this forensic approach uncovers invisible processes and links them to visible and physical realities. This analysis serves to localize key spaces of intervention.

A Reparative Vision

A territorial vision for spatial reparation will be articulated based on findings from the above outputs. This design exercise will be driven by strong socio-environmental values and adjusted given the highlighted spatial and physical opportunities of the local context.

03. METHODOLOGY
03.04 THEORETICAL FRAMEWORK

The theoretical review which accompanies this project created a theoretical thread to best understand the problem at stake, the driving forces which have driven the problem, and explores possible theoretical alternatives.

Base Theories

Planetary Urbanization:
Brenner & Schmid (2012), Lefebvre (2013)

The scale of anthropogenic occupation of the terrestrial critical zone is planetary. Urbanization must now be analysed far beyond city boundaries - as externalities emerging from the urban, such as high emissions, land-use changes to sustain urbanites... have impacted planetary landscapes. This theory allows an expended understanding of the consequences of urbanization, outside of thie city, and makes us reconsider what is urban.

Capitalist Territorialization:
Gandy, (2002), Sibertin-Blanc (2010)

Urbanization, since the industrial age, has been linked to the space of capital productivity. It has been argued that great schemes to improve and develop urban spaces was not without economic profit in mind. An urbanization dictated by profit and in search of capital encourages a dystopic development of human' s primary habitat. Capitalist urbanization derives from an exploitative and extractive culture, which drive resources from outside of urban boundaries to sustain the center of capital. Here, a distinction between the land on which we live and the one from which we live is created.

Problem-Forming Theories

Metabolic Rift:
Barca & Bridge (2015)

The theory of metabolic rift outlines the perceivable disconnect created between the urban and the rural - which has caused a destructive spatial differentiation. This disconnect is both a spatial and sociological divide between economy and ecology, human habitat and the environment, individuals and matter.

Broken Nature

The notion of broken nature derives from the dilapidated state of various ecosystems which are put under pressure by anthropogenic forces. Nature, a generic term to describe bio spheric and ecological processes as well as non-human life forms, is vital to the functioning of the planet: performing climatic regulations, fertilizing soils, and balancing biodiversity chains. The current state of - can be described as broken due to human activities which have changed and fragmented environments, accelerated species extinction, and destabilized chemical cycles.

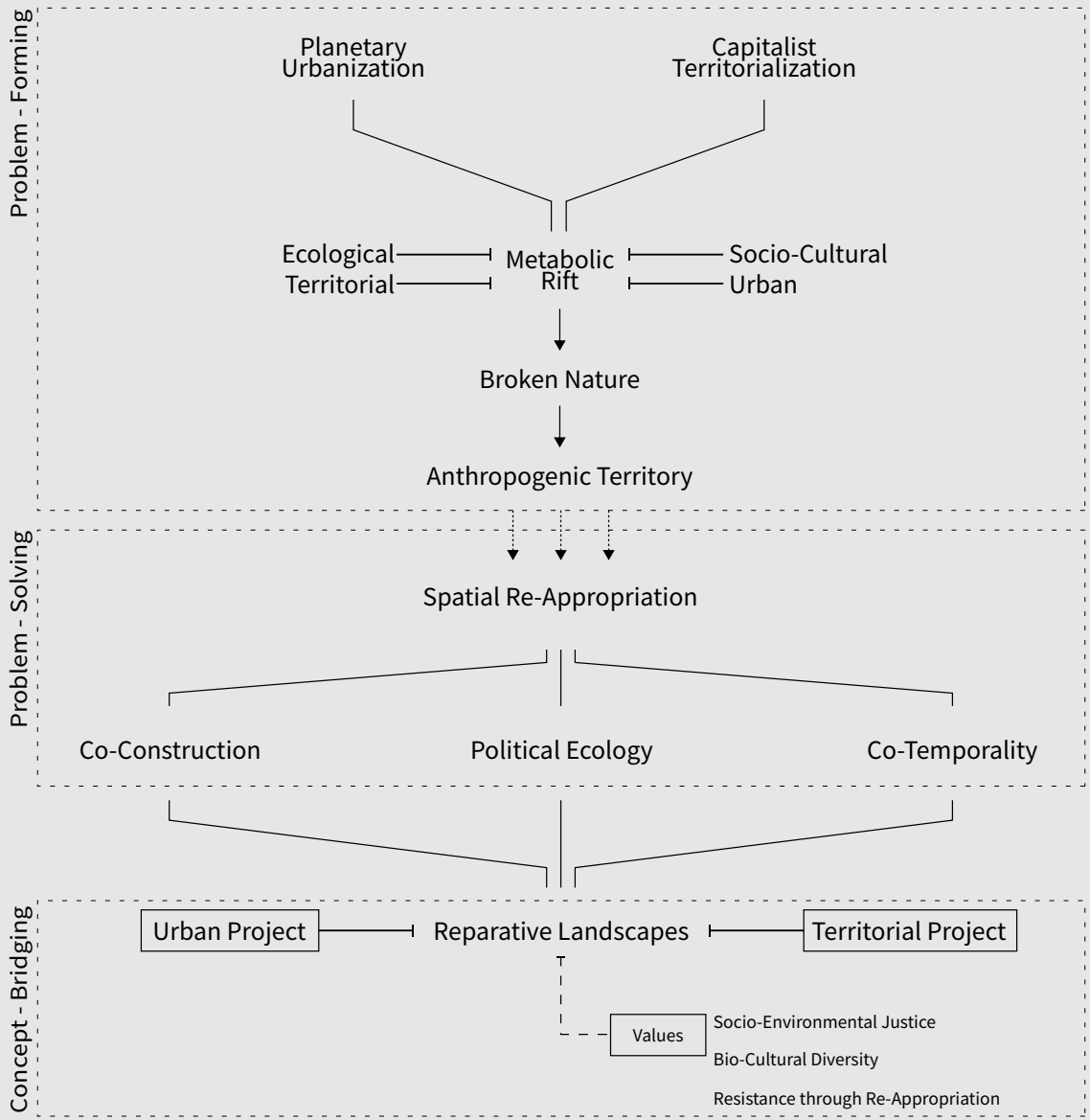
Problem-Solving Theories

Spatial (Re) - Appropriation:
Harvey (2008), Belanger (2020)

This spatial theory calls for a re-appropriation of spaces from capital to best serve communities and ecosystems which depend on the land. This theory is associated with acts of resistance and mediation between dominant forces currently in charge of landscape modifications and entities that are not taken into sufficient consideration. This spatial notion serves as a guiding principle in this research project.

Political Ecology
Robbins (2012), Demos (2016)

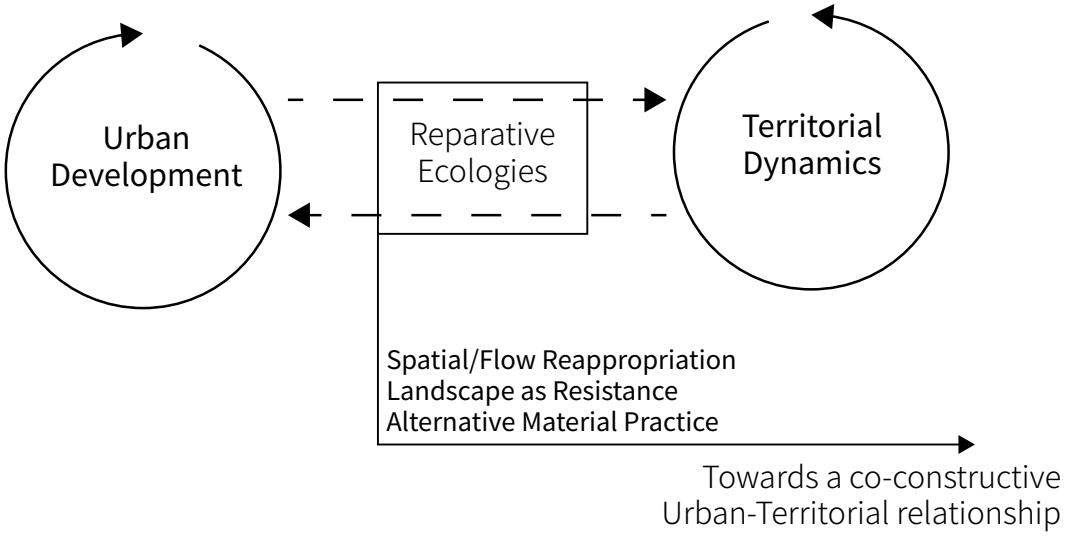
This large spectrum theory looks at formulating governance structures which work within the confines of planetary capacities. Theorist associated with this notion call for a realignment of habitation and development patterns with geographic realities to imbedded anthropogenic systems (political, economic, and cultural) into the larger eco-systems that they depend on.



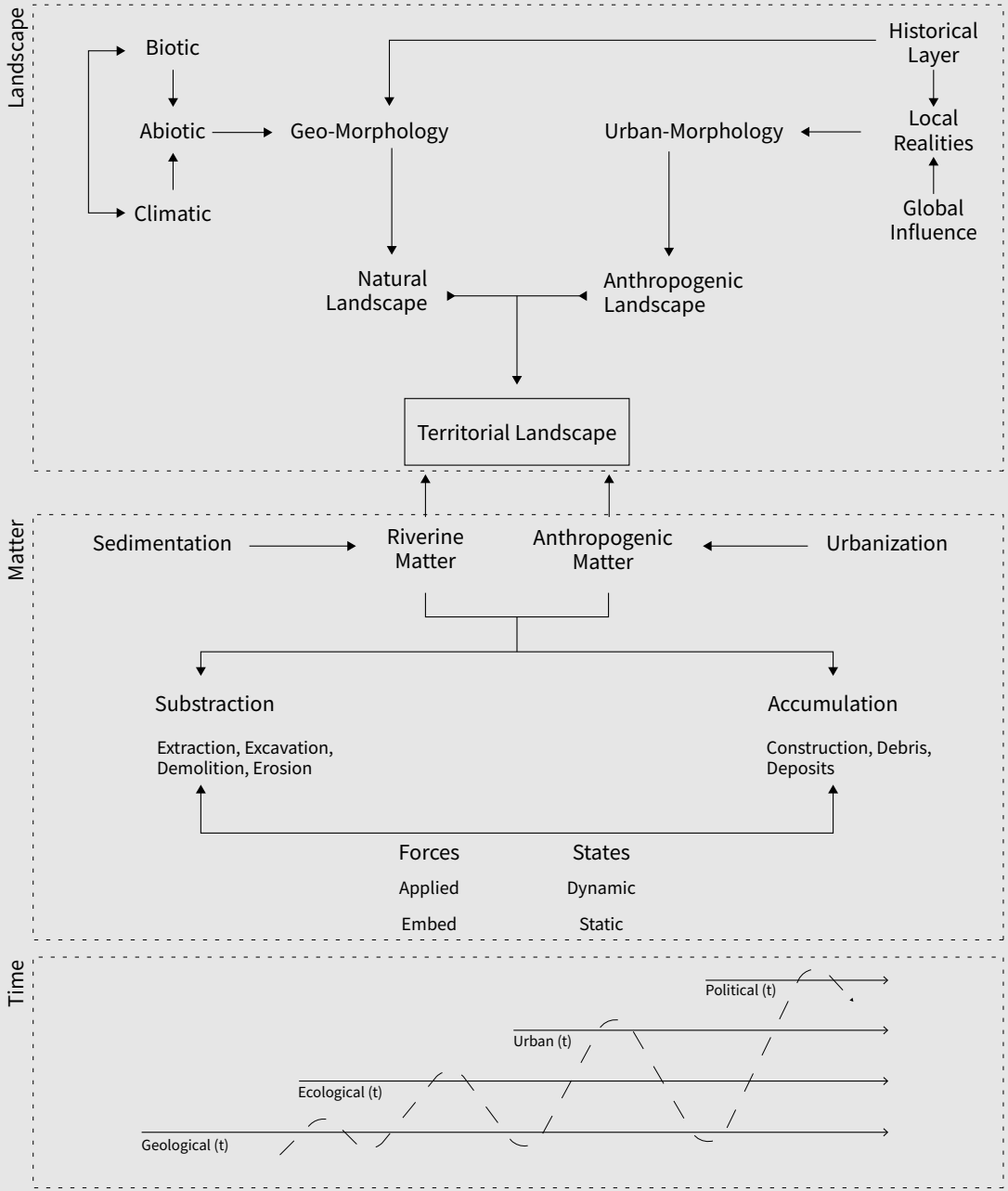
Theoretical Framework
Hadrien Cassan (2021)

03. METHODOLOGY
03.05 CONCEPTUAL FRAMEWORK

The Conceptual Framework underpins spatial concepts which seek to apply correlations made in the theoretical framework with the physical realities of the context. The three main elements that constitute the conceptual framework surround the notion of the landscape, the matter, and the forces. Anthropogenic urban activities are closely intertwined with the realities of the geological landscape. The forces applied and embedded in the dual matter, the anthropogenic and riverine matter, form the ground of the territorial. The framework here looks to form a relational understanding of otherwise separated realities.



Conceptual Diagram
Hadrien Cassan (2021)



Conceptual Framework
Hadrien Cassan (2021)
inpired by Lowner (2019)

03. METHODOLOGY
03.06 ANALYTICAL FRAMEWORK

Lines of Inquiry

The subject of the analysis follows the 4 lines of inquiry set up by the Transitional Territories Studio: Matter, Topos, Habitat, and Geopolitics. These four (4) entry points into the project allows to grasp a complete perspective on the landscape of interest, from the components of the land (matter), to its shaping-forces (topos), to its occupation and cultivation (habitat), to its governance structure (geopolitics). These four lines of inquiry shape the fifth one: the project.

Temporal Analysis

Time is an important element in the analysis and design phase of the project. Time will be used as an analytical tool looking at the evolution of dynamics in space: the urbanization process, geomorphologic accumulation, ecological cycles. Time here will aid in creating corelation between processes that have unflded through milion of years and ones that have unfolding in decades. Time will also be used as a design tool. Striving for new transitional ecologies, the process of modification of space from one state to another requires the patience and understanding of the temporal influence.

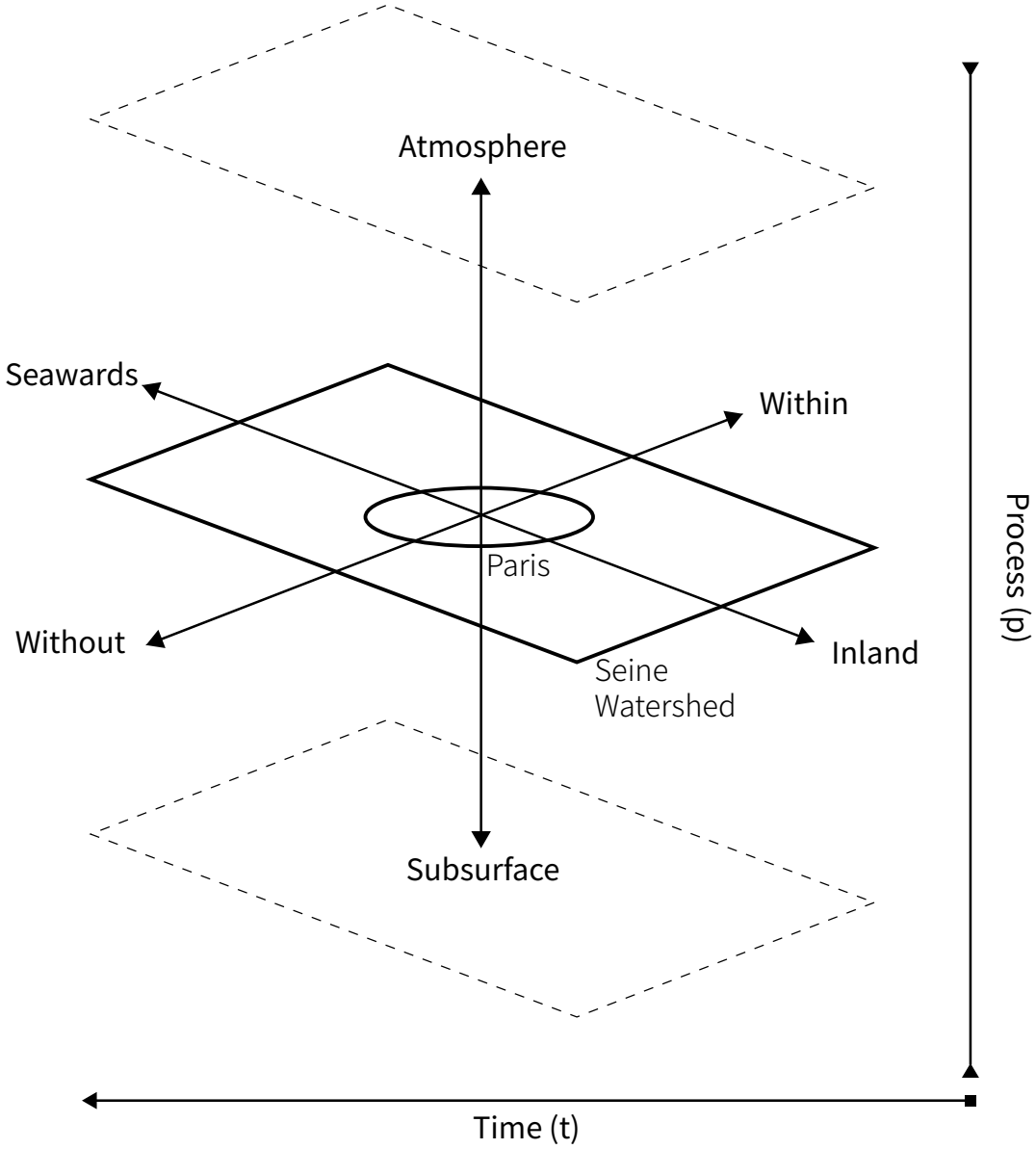
Forensic Analysis

The project lies within the understanding that specific actions in urban settlements have a source and repercussions outside of city boundaries. Therefore, a cross-reference of action will be essential to constantly link a territorial dynamic to an urban one. A forensic approach will track matter associated to urban development project in the Grand Paris - as it moves through space and time as a result of political decisions making.

Transitional Territory Symposium Title (2021)

The Transect

The transect as a spatial tool to expose relations which the naked eye could not see. This representational tool reveals the stratification of the territory: from deep water and minerals to geomorphology and hydrography to urban concentrations and critical ecological sites. On top of a purely spatial transect, we can overlay processes that unfold through time and the system of geo-political dominance which, applied on the territory, regulates, and shapes it (Weizman, 2021). From the notion of the Critical Zone, a cut from subsurface to the atmospheric surface, representing the layer of human and non-human occupation on Earth, will be conducted to create an in depth understanding of vital relationships (Latour, 2020).



Transect Diagram
Hadrien Cassan (2021)

03. METHODOLOGY
03.07 METHODS

Problematize and Conceptualize

Literature Review

This initial method helps to best understand the 'real-life' developments and lay down the problematics of the research project. Looking at ongoing - academic and nonacademic - context specific and broad - discourse around processes related to urban development, ecology, and socio-political struggles allows to ground the research with societal and scientific relevance. The literature was chosen from a pool of scholars that range in disciplines (from urbanist to geologist to artists), in epoch (from the 1960s and the start of the Western environmental movement to more contemporary and recent publishing), and geographic background (from North America to Europe).

Artistic Exploration

This research is fed by artistic projects which are associated to urban, ecological, and material processes. This method is deemed relevant as it exemplifies alternative ways of conceptualizing and representation shared problematics through various mediums. This exploration is done by researching various artistic practices, and exploring on-going and past exhibitions relevant to the field of research.

Explore and Understand

Satellite and Photographic Exploration

Representation is done through photographic evidence and other forms of visual translation. Given the current pandemic situation, on site visits were not possible and therefore Google Maps and other satelite imagery platforms as well as Street View perspectives were widely explored to get a firm grasp of the landscape in question. Tools in Google Street View also allowed a temporal visit of a space (going back in time and seeing the physical changes).

Case Studies

Case studies were done to best understanding various location specific problematics. Sites were chosen according to their relevance in the process of urban development. They were chosen to illustrate the full spectrum of landscapes and communities which are directly or indirectly impacted by processes of urban transitions. Case studies were performed holistically to form a physical, political, socio-economic, and ecological understanding of spaces.

Map and Project

Critical Cartography

The act of cartography is the primary method used to understand ecological and urban dynamics, expose processes, and communicate findings. The cartographic exercise done through the line of inquiries allows to create a base of representation of the current state of. These maps and drawings place a critical perspective on what is represented, surpassing simple land-use maps, and exploring temporal changes and relational processes which are usually under-represented yet primordial in territorial understanding.

Projective Mapping

Mapping is also used as a tool to project visions towards desired futures. Projective mapping is used to illustrate possibilities and imagine the new state of. A map is not only a representational outlet it can be used as a tool of resistance to challenge the status quo, to uncover vital invisible flows, serve in the appropriation of space. All in all, projective mapping here will be used for all the above in to synthesize a reparative territorial vision.

LIMITATIONS

Covid-19

Due to the Covid-19 pandemic, among other life-changing events, this project is conducted on its unique time schedule and far away from the site of research - visits were therefore substituted by long hours spent on Google Maps and Street View and the work schedule was adjusted to allow flexibility.

Academic Bubble

Due to unpredictable circumstances, there were no possibilities for direct interactions with active actors on the ground or communities impacted by the design. This unfortunately weakens the possible application of the design interventions in practice. Yet a thorough reading of local sources and literature allowed to gain a personal insight on the space.

Representation Methods

If time permitting, I had wished to experiment more with methods of representation that go beyond the conventional plans and sections. While this project allowed me to develop my digital skills and style, I would have liked to apply more gained skills (animation with aftereffects....) to better deliver and present my ideas. Additionally, I would have liked to experiment with physical creations related to the research through material explorations, and installations.

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04 ATLAS OF DECONSTRUCTION

01 Matter
02 Topos
03 Habitat
04 Geopolitics
05 Projection

04 ATLAS OF DECONSTRUCTION
04. INTRODUCTION

Lines of Inquiry

As part of the Collective Research phase proposed by the Transitional Territories framework, a multi-layered analysis was conducted follow 4 entry points: Matter, Topos, Habitat, and Geopolitics. This analysis allowed to comprehend and represent the current state of the territory this reasearch project focuses on: the Seine Watershed. Through maps, sections, and diagrams this atlas offers the composition, alterations, and limits of the territory and creates a shared narrative between the River' s watersehd and the development of the centrally placed Parisian Region.

The final line of inquiry, the Project, forms of a synthesis of the perception of the territory and is the basis towards a design projection.

Lines of Inquiry Description
Transitional Territories (2020)

Matter
Subjects: earth/soil, water, air
Scales: Macro, meso, micro
Steps:
a. Catalogue of subjects
- Index (long list)
- Short list (minimum of 3/description and representation)
b. Deconstruction of subjects (from short list)
- Composition
- Alteration
- Limit

Habitat
Subjects: mutualism, competition, diversity, entropy
Scales: Macro, meso, micro
Steps:
a. Catalogue of subjects
- Index (long list)
- Short list (minimum of 3/description and representation)
b. Deconstruction of subjects (from short list)
- Composition
- Alteration
- Limit

Topos
Subjects: terraforming, erosion, translation, flux
Scales: Macro, meso, micro
Steps:
a. Catalogue of subjects
- Index (long list)
- Short list (minimum of 3/description and representation)
b. Deconstruction of subjects (from short list)
- Composition
- Alteration
- Limit

Politics
Scales: Macro, meso, micro
Subjects: climate regime, ethics,
displacement, ownership
Steps:
a. Catalogue of subjects
- Index (long list)
- Short list (minimum of 3/description and representation)
b. Deconstruction of subjects (from short list)
- Composition
- Alteration
- Limit

Project
Assemblage of subjects/Projections

Secret of the Pyramide du Louvre
JR (2018)

04 ATLAS OF DECONSTRUCTION
04.01 MATTER

Earth, water, air

Catalogue

01. Geomorphology
Accumulation of layers of geological formation – fossil deposits, rock formations, sedimentation

02. Tectonic dynamics
Processes shaped by eartlhy movements

04. Fluvial dynamics
Earth shaped by aquatic movements

05. Geological characteristics
Rocks and their properties for human use

Shortlist

01. Layers of accumulation
Geological profile show the history of land through water, earth, and air interaction

02. Processes
Land formation derives from both aquatic, climatic, and now anthropogenic influences

03. Movements
Movement on the mater of earth are both embeded (gravity, water flow, wind gushes) and applied (extraction, excavation, modified)

Les Buttes de Chaumonts
BnF (1909)

Pile of Bricks
Lara Almarcegui (2012)

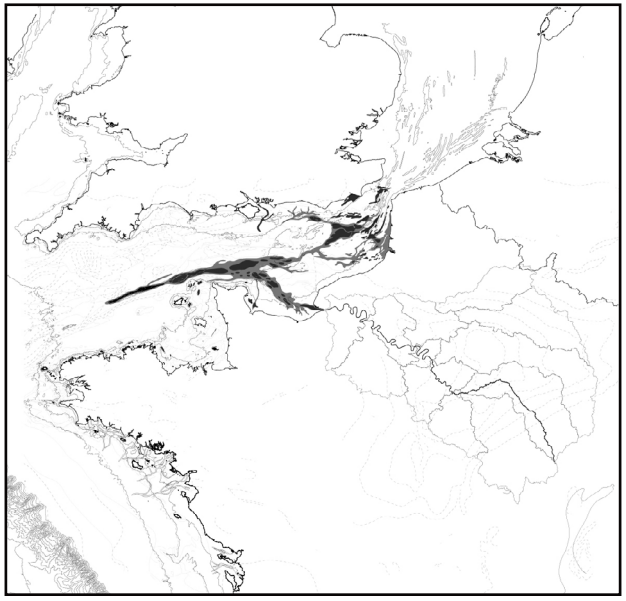
04 ATLAS OF DECONSTRUCTION
04.01 MATTER

Composition

The Parisian Basin is a geological landscape composed of various accumulated layers of sedimentary rocks. The land which the Seine river system carves through is the result of millions of years of dynamic water and land interaction. The advancement and retreat of oceans, seas, and lakes have resulted in the accumulation of fossil and sedimentary deposits which form a unique and precious fertile surface. The formation of land is a consequence of the passage of water, highlighting the intrinsic connection between the two matters in the creation of the landscape. The processes of terrestrial formation are incremental and invisible in our lifespan. In a reciprocal exchange, the river system provides new matter to oceans: sediments in the form of sand, mud, and other matters (natural and anthropogenic…) – which flow down the river to its mouth in the English Channel towards the open water, and ultimately down and across the ocean bed.

Geologically, we are in the Holocene epoch, which began about 12 000 years ago after the last major glacial epoch (Cohen et al., 2020). Yet today it is argued that human activities since the industrial revolution, notably through subsurface mining, extreme carbon emissions, and deposits of nuclear waste, will leave a long-lasting (geological) imprint on the composition of Earth. Although not officially recognized, we are said to have entered a new geological epoch: the Anthropocene - where anthropogenic systems have replaced aquatic and climatic forces as the drivers of terrestrial modeling.

Sediment Movement in La Manche

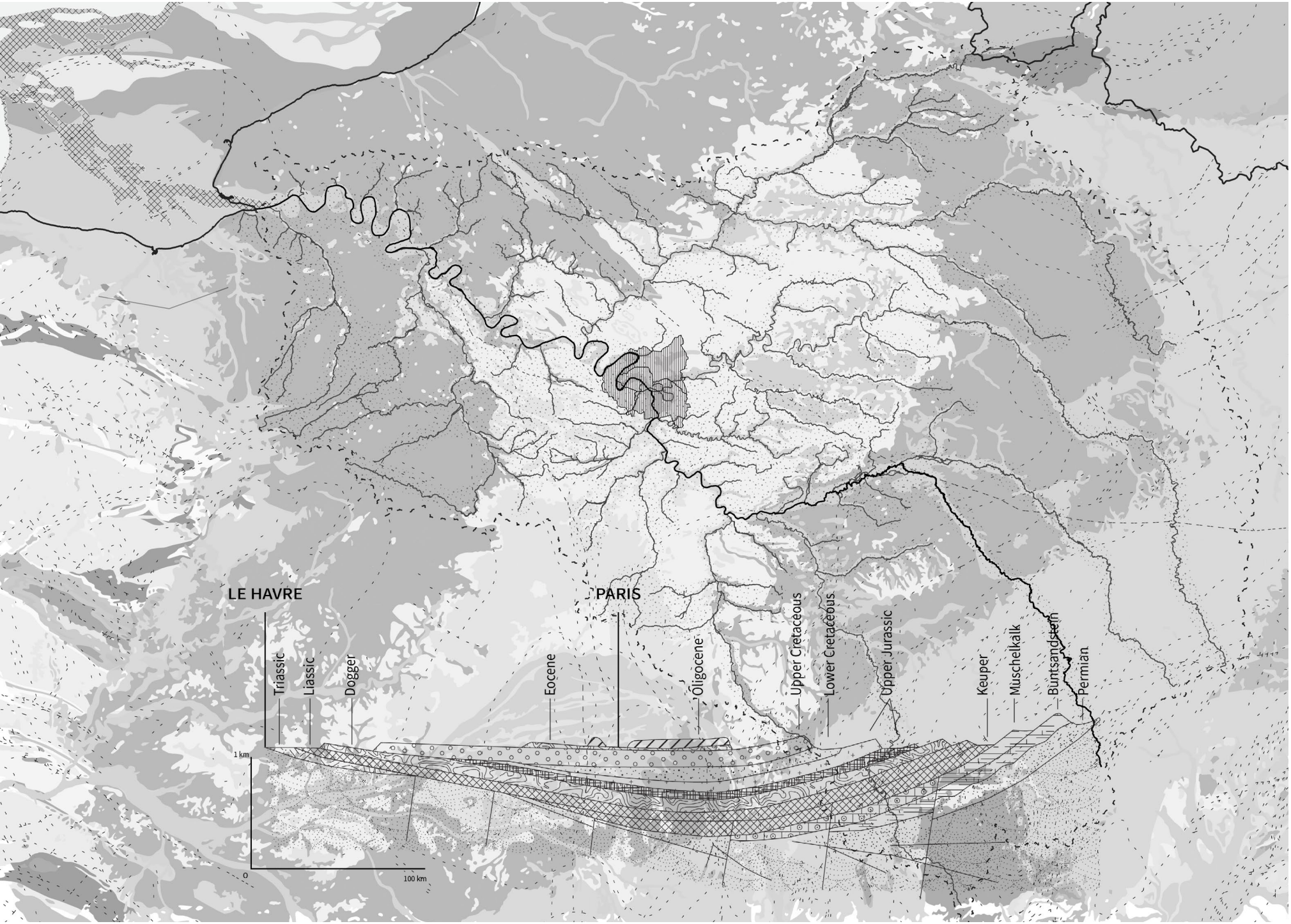


Parisian Basin Geological Composition

The geological formation of the Seine River Basin highlights the long history of the Parisian Basin formation - this map highlights the dynamic forces which compose the basin in which the city of Paris sits in the center.

- Upper Cretaceous
- Mid Jurassic
- Lower Cretaceous
- Upper Jurrassic
- Tertiary
- Fault
- Watershed
- La Seine
- Tributaries
- National Border
- Grand Paris

Macro-scale Map 1:1 200 000

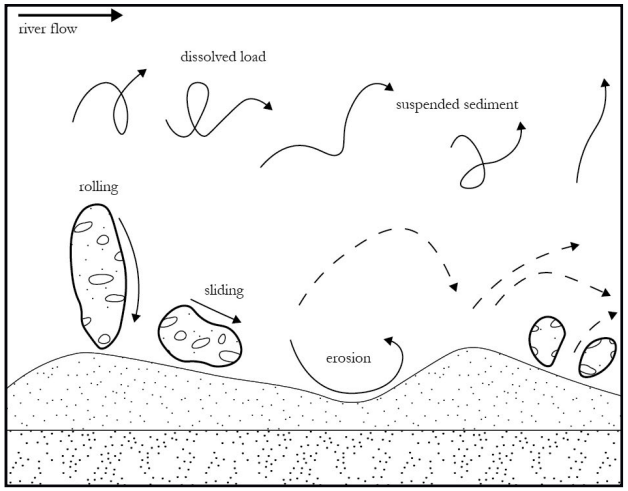

LE HAVRE
PARIS
Triassic
Liassic
Dogger
Eocene
Oligocene
Upper Cretaceous
Lower Cretaceous
Upper Jurassic
Keuper
Muschelkalk
Buntsandstein
Permian
1 km
0
100 km

04 ATLAS OF DECONSTRUCTION
04.01 MATTER

Alteration

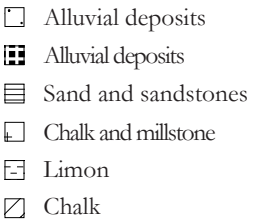
The various vertical layers of Earth which can be found in the Seine River Basin are the temporal results of water dynamics. The ground, which surrounds the Seine, is extremely rich given its depth yet not remarkably diverse: limestone, gypsum, marl are the main mineral components found in the first layers of the subsurface. Through the sectional view, a temporal history unfolds. Each layer represents an era, each depth signifying the longevity of that era, each topographic variation alludes to the shape of the formatting water bodies. The sectional alterations become a way to read the historical changes of the landscape. Here represented is a geological scale of elements – therefore telling a story that dates back millions of years. The Seine basin is found in a relatively low and slightly undulated landscape. A hint is made at human interventions on the geological formation of the basin – justifying the appellation of the Anthropocene as an epoch of significant geological modification.

Sediment Process and Motion

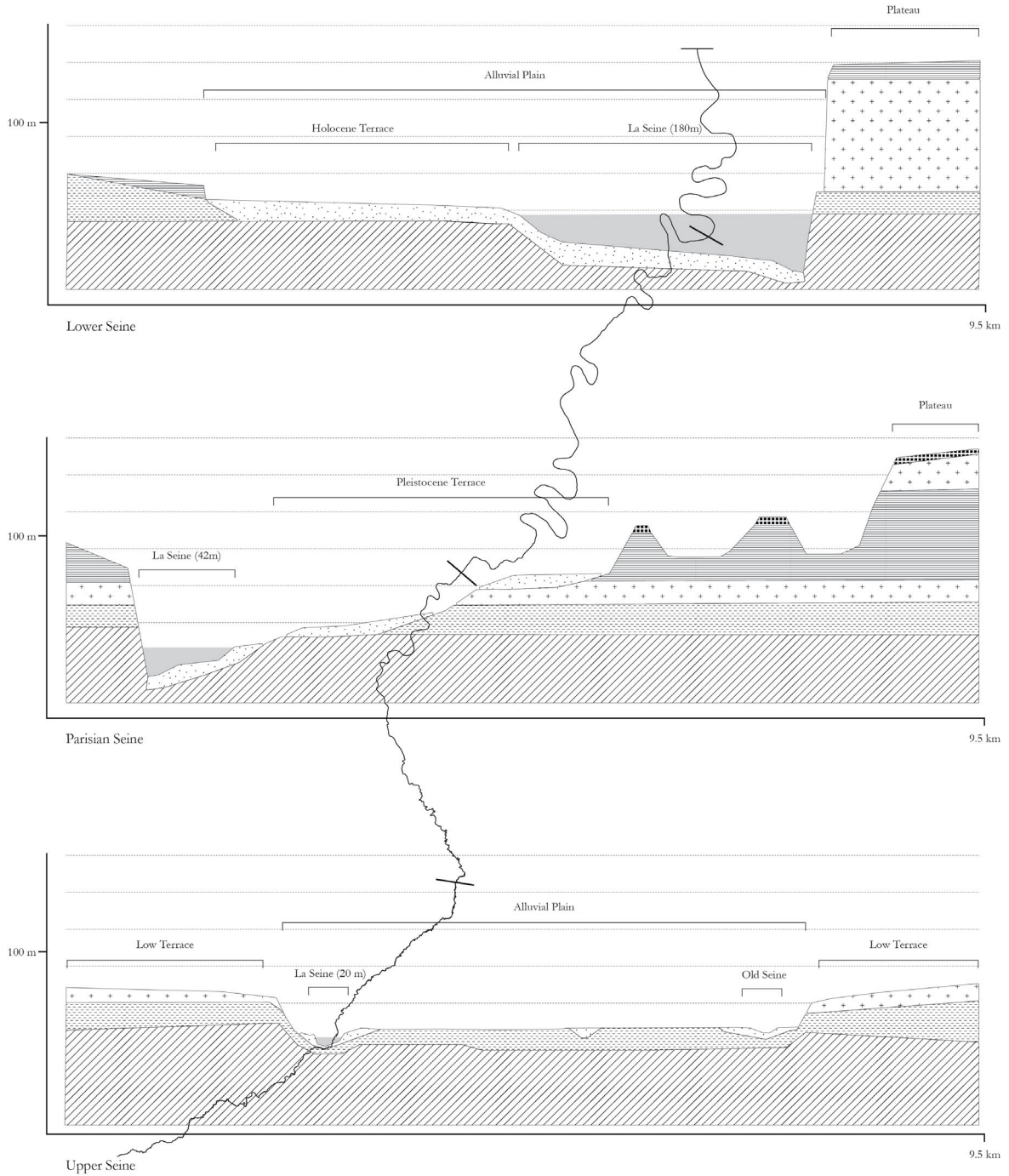


Seine River Basin Geological Formation

The river basin' s geological profile tells the history of Earth' s particular composition which stems from water and air induced alterations.



Macro-scale Section


Plateau
Alluvial Plain
100 m
Holocene Terrace
La Seine (180m)
Lower Seine
9.5 km
Plateau
Pleistocene Terrace
100 m
La Seine (42m)
Parisian Seine
9.5 km
Alluvial Plain
100 m
Low Terrace
Low Terrace
La Seine (20 m)
Old Seine
9.5 km
Upper Seine

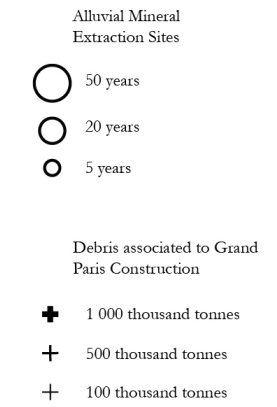
04 ATLAS OF DECONSTRUCTION
04.01 MATTER

Limits

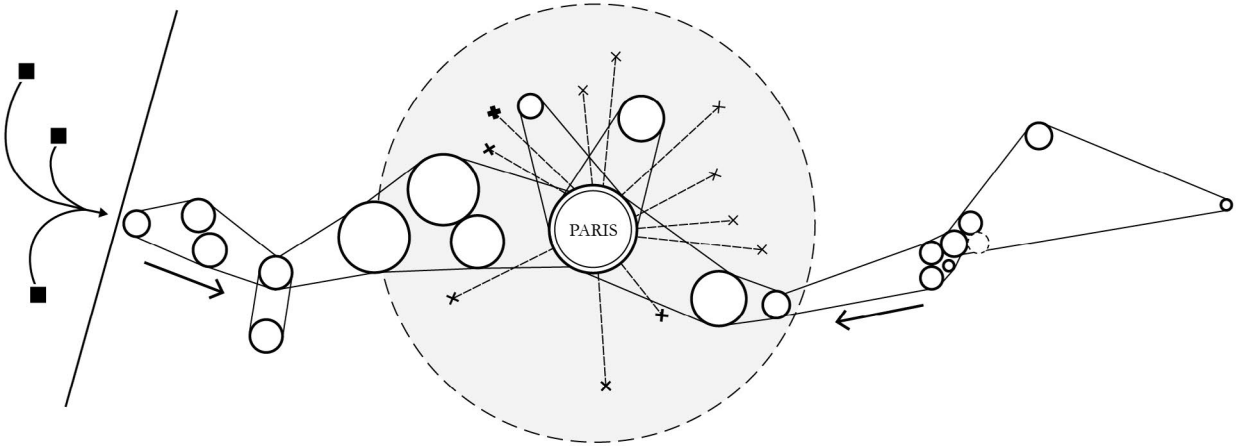
The limits here illustrate the anthropogenic forces applied to matter. These forces correspond to the extraction of sedimentary matter – such as aggregates and sands - found in high concentrations in the riverbanks and its meanders. The extraction and application of an alternative movement of matter characterize the scale of human interventions as a new geological force becoming seemingly as powerful as the dynamic exchange between land and water over millions of years. For this reason, we can conclude that we have entered the new geological epoch of the Anthropocene. While land and water respond to climatic forces and are motivated by gravitational forces, human-induced movements of matter are agenda-focused: development of human landscape occupation and the unique anthropogenic systems which have derived from civilization. The appropriation, modification, commodification, and application of matter have become a given in society as the foundation of human settlements. The city of Paris represents the anthropogenic gravitational force in the territory as the space where matter is moved towards. As a concentrated urban area, the city becomes a producer of anthropogenic matter through the likes of demolition debris, excavated soils, wast… The anthropogenic agenda has long isolated itself from external systems provoking many disruptions to other ecological and climatic dynamics, exposing a non-co-evolutionary relationship.

Centeralized Movement of Matter

Matter represented here by extracted sediments are being commodified and moved by human pressures towards anthropogenic gravity points: metropolis.



Diagram



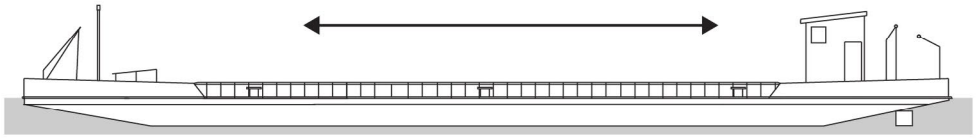
14 000 000 tonnes (2012)
construction material

1902 kt/yr
debris

+ 10 000 000 m3
exacavated soil

14 000 000 tonnes (2012)
construction material

24hr boat traffic



average capacity: 900 t
lenght: 50-60 m

Flow / Counter Flow

Seine River Flow
100 - 2000 m3/s

Suspended Particule Matter
44 mg/L

04 ATLAS OF DECONSTRUCTION
04.02 TOPOS

Terraforming, erosion, translation, flux

Catalogue

01. Riverbed modification
Anthropogenic and embedded forces which shape the river profile

02. Floodplain modification
Anthropogenic modifications of riparian corridors

03. Riverbank appropriation
Anthropogenic river edges alterations

04. Sedimentation
accumulation of matter

05. Mineral extraction
Site of mineral (for construction use) extraction

05. Fluvial dynamics
Hydrodynamics, discharge, variations.

Shortlist

01. Riverbed appropriation

02. Anthropogenic modifications

03. River dynamics: risk and management

Seine River Dam
Screenshot from Google Street View (2021)

Aggregate Processing
Screenshot from Google Street View (2021)

04 ATLAS OF DECONSTRUCTION
04.02 TOPOS

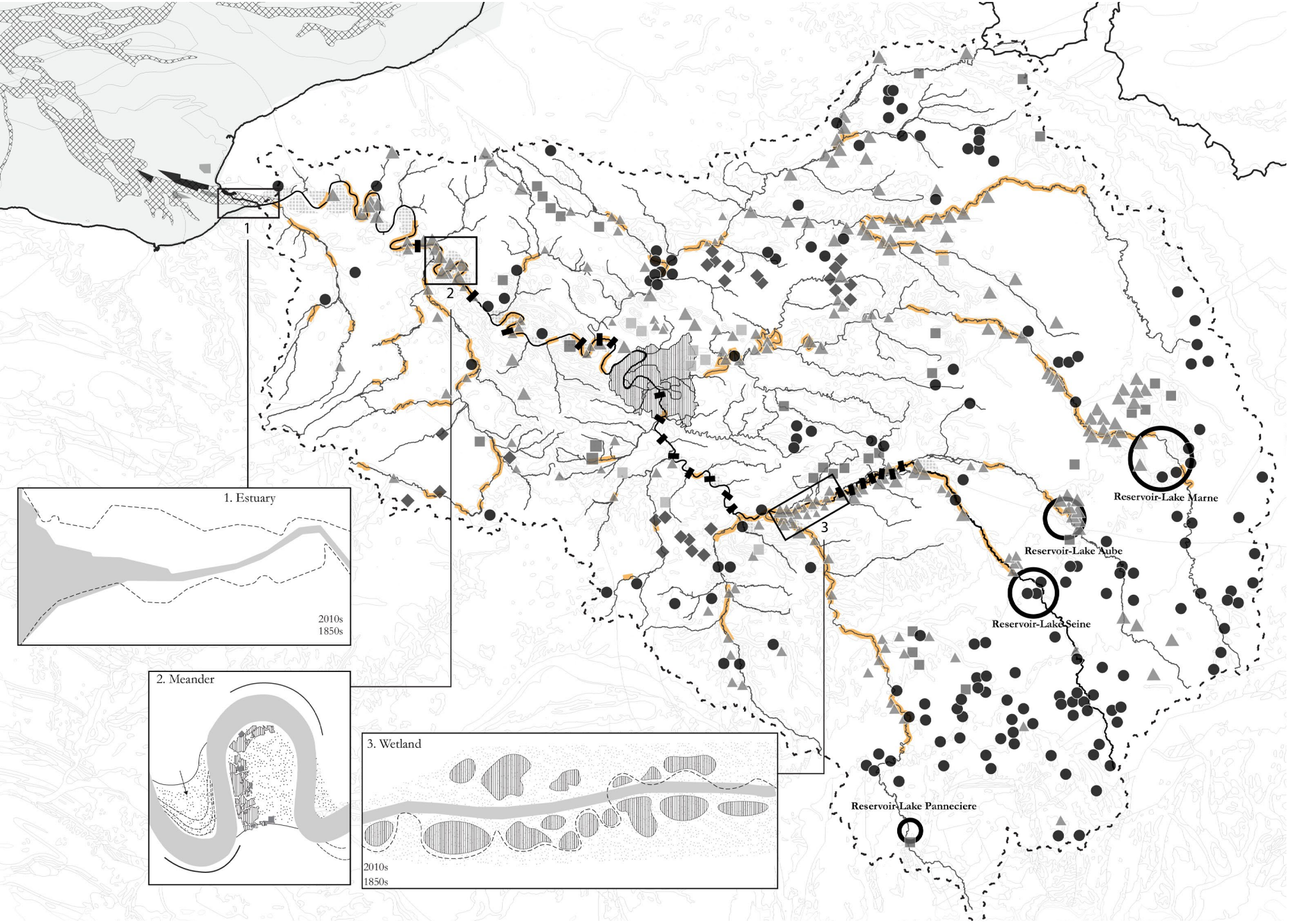
Composition

The Seine is an anthropogenic river: its entire watershed is under the control and management of humans. This control is apparent through the alterations made to the river basin impacting the fluvial dynamics and the adjacent riverine territory. While remnants of a non-altered water body can be read through topographic information - notably through the traces of the dynamic meanders, the river has been forced into a static channel to best serve and protect human occupation. In the last 200+ years, the Seine River and its tributaries have undergone aggressive modifications on the longitudinal, lateral, and vertical axis: the river channel has been narrowed, its course straightened, and has been equipped with various engineering works such as locks, weirs, and reservoirs to regulate discharge and water levels (Lestel et al., 2020)… Today, the processes of terraforming, erosion, translation, and flux are, for the most part, provoked and accentuated by humans. The river has little agency in its formation and all embedded-forces that would counteract the possibility for human activity to prosper are either controlled or reversed. The river today serves the primary utilitarian purpose of navigation both of goods coming from overseas as well as for internal traffic pertaining primarily to mineral movements for construction purposes. The river also serves as a cooling agent for industrial and nuclear riverine activity, and as a secondary hydro-electrical production source. All functions of the river have been operationalized.

Anthropogenic Watershed

The Seine' s watershed is a composition of various actions and resources applied by anthropogenic forces.

Macro-scale Map 1:1 200 000


1
2
3
1. Estuary
2010s
1850s
2. Meander
3. Wetland
2010s
1850s
Reservoir-Lake Marne
Reservoir-Lake Aube
Reservoir-Lake Seine
Reservoir-Lake Panneciere

04 ATLAS OF DECONSTRUCTION
04.02 TOPOS

Alteration

The anthropogenic utilization of the river has resulted in noticeable alterations in the profile of the Seine. As seen from these sections, the river has been significantly deepened to facilitate navigation. The river has been channelized and its banks stabilized (artificialized), particularly in floodplains that have been equipped with dikes and levees. The presence of locks and weirds have caused the modification of river flow often impacting the morphology of the river as well. Various naturally forming islands have been leveled or attached to the banks to favor a direct channel and minimized the otherwise in-born dynamic changes. Through various engineering structures, water levels are intended to be kept at a fixed value +- 35 cm with minimal river discharge variations. While these interventions have significantly altered the riverscape, they highlight a dissociation between its applied function and the naturally-occurring functional processes which unfold in the river. This is exemplified by the yearly repeated dredging activities to erase the formation of sandbars and sediment accumulation. These interventions have altered the hydrological functioning of the river which in turn has impacted its ecological dynamic. The river' s fish population has largely fluctuated through the ages as interventions on the river channel and varying water quality (and chemical composition) have disturbed their habitats and spawning grounds.

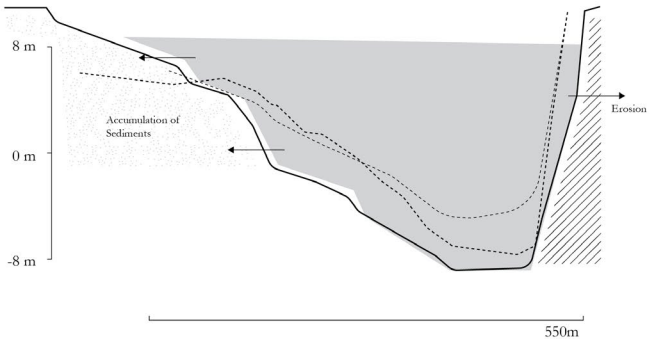
Lower Seine Temporal and Anthropogenic Alterations

Three profiles of the Lower Seine River and their temporal transformations provoked by humans.

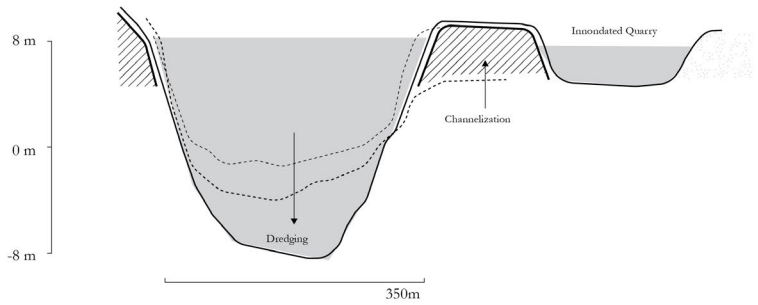
— Current profile
- - 1950s profile
- - 1900s profile

Section

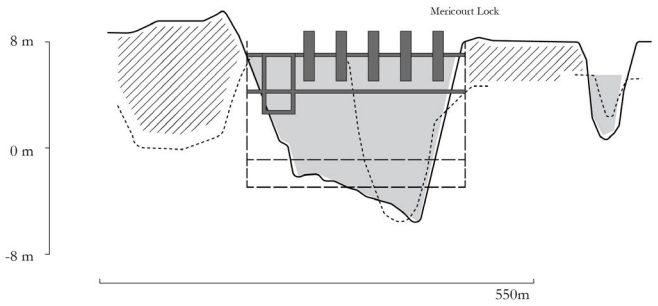
Natural Processes
(embeded)



Anthropogenic Modification
(applied)



Anthropogenic Control

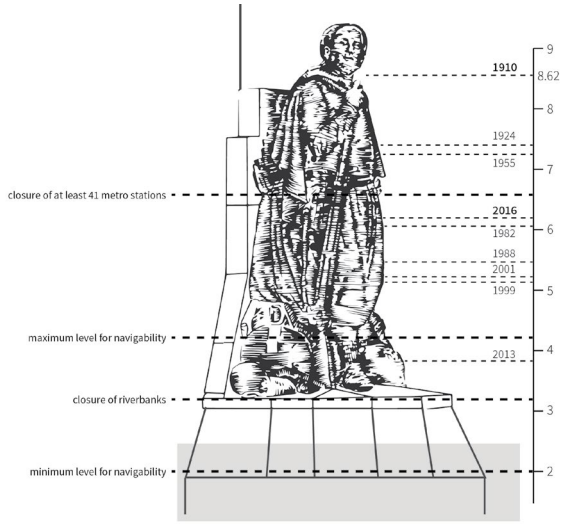


04 ATLAS OF DECONSTRUCTION
04.02 TOPOS

Limits

The process of anthropogenic river-scape transformations exemplifies a will to alter systems that are not fundamentally understood as they require repeated engineering interventions highlighting their limits. Anthropogenic control has been exercised massively on the channel and riverbed of the Seine and its tributaries. These interventions have been incremental and begun in the 1800s when the city of Paris was rapidly industrializing. The Seine has, for the most part, been channelized downstream of the city of Paris to ensure minimal variations in the river channel. In 1910, Paris experienced the largest flood event in its collective memory with the Seine' s water level exceeding 8 m above typical height. The city halted for several weeks as boulevards and basements were underwater. Although not fatal the disasters caused much damage to structures and infrastructures in the city. From then on, large scale reservoirs were constructed upstream of the Parisian metropole to ensure flood protection and low-water discharge in times of heavy rainfall and winter floods. Undergone engineering solutions of the 20th Century seem to still not suffice as rain periods have intensified in the last decades. Currently, a fifth water catchment infrastructure system is underway: la Grande Bassée. Today the river is under the control of the Minister of Ecology and the VNF (Voies Navigable de France) is the administrative branch in charge of managing all navigable waterbodies functioning in the country – highlighting the main perceived function of the river as a mobility channel.

Diagram of the Zouave, Pont de l' Alma
Hadrien Cassan (2021)

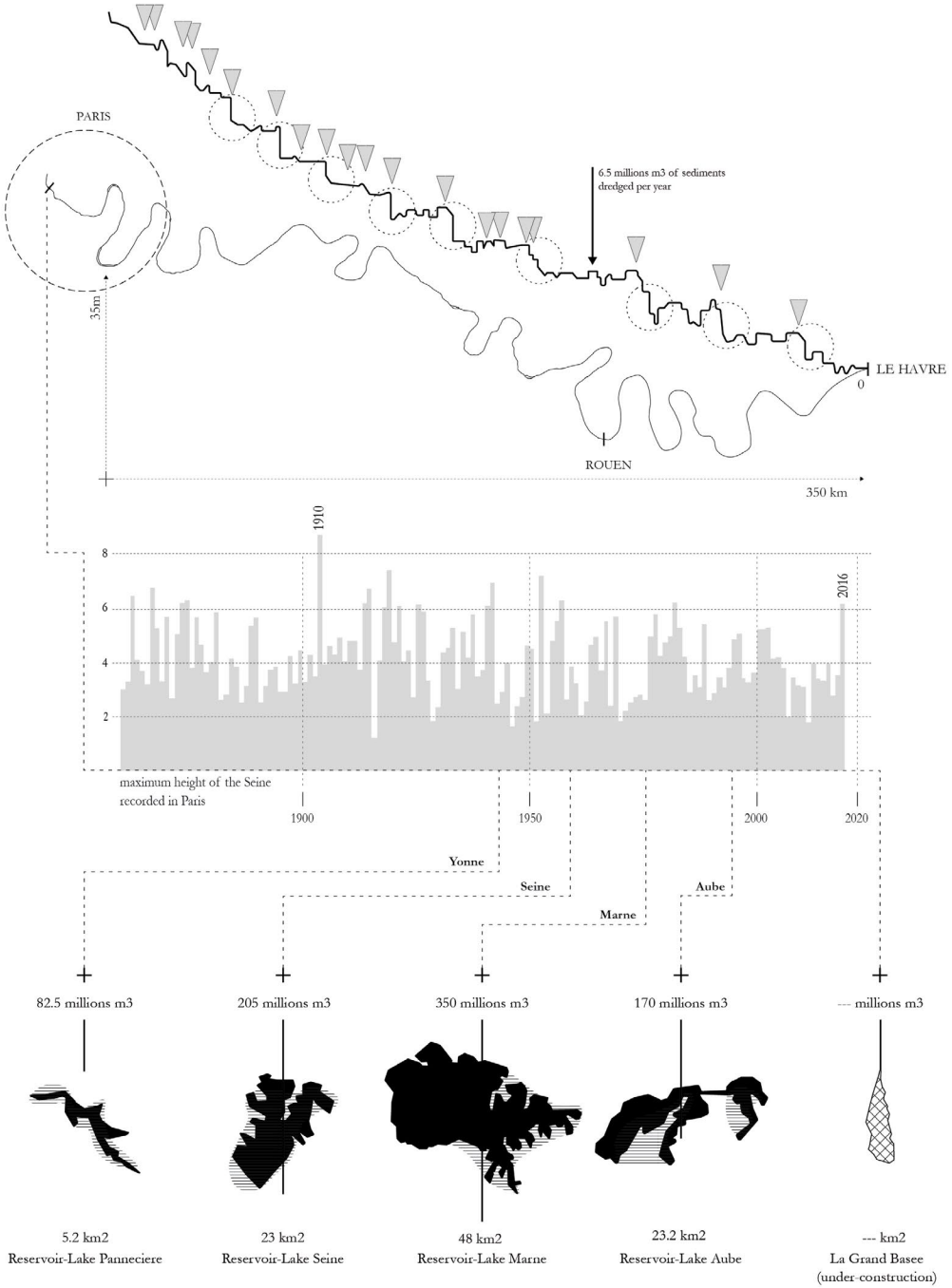


Seine River System

Temporal diagram relating flood events and fluctuations with the construction of flood-defense infrastructures.

Dam/lock
Significant Channel Depth Change

Diagram


PARIS
6.5 millions m3 of sediments dredged per year
35m
LE HAVRE
0
ROUEN
350 km
1910
2016
8
6
4
2
maximum height of the Seine recorded in Paris
1900
1950
2000
2020
Yonne
Seine
Marne
Aube
82.5 millions m3
205 millions m3
350 millions m3
170 millions m3
--- millions m3
5.2 km2
Reservoir-Lake Panneciere
23 km2
Reservoir-Lake Seine
48 km2
Reservoir-Lake Marne
23.2 km2
Reservoir-Lake Aube
--- km2
La Grand Basee
(under-construction)

04 ATLAS OF DECONSTRUCTION
04.03 HABITAT

Mutualism, competition, diversity, entropy

Catalogue

01. Urban processes
urban renewal, demolition, construction

02. Landscape functions
land use change, lost ecosystems, new ecosystems, protected ecosystems

03. Socio-economic fluctuations
population displacement, cultural replacement

04. Historical evolutions
imprints of layers of habitation

05. Styles, trend, and periods
generic, innovative, repetitive, unique

Shortlist

01. Urban modifications
urban renewal, construction, and extension of connected systems

02. Surface and subsurface occupation
urban inhabitation is historically not simply a surface occupation but requires sub-surface alterations.

03. Externalities of urban development and renewal

Haussman Renovation Demolition Site
BnF (1858)

Montfermeille, Screenshot from video
JR (2016)

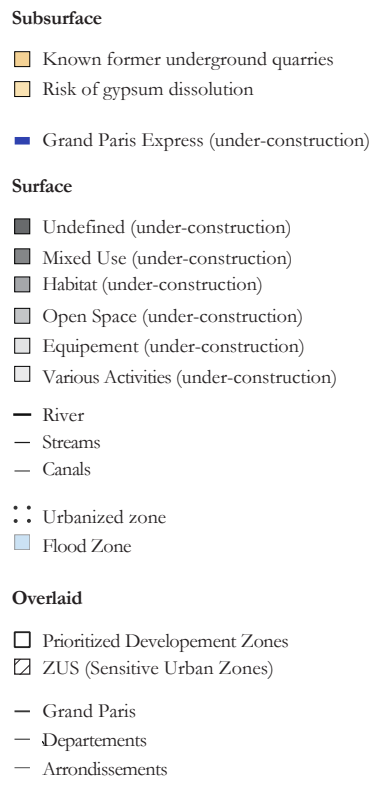
04 ATLAS OF DECONSTRUCTION
04.03 HABITAT

Composition

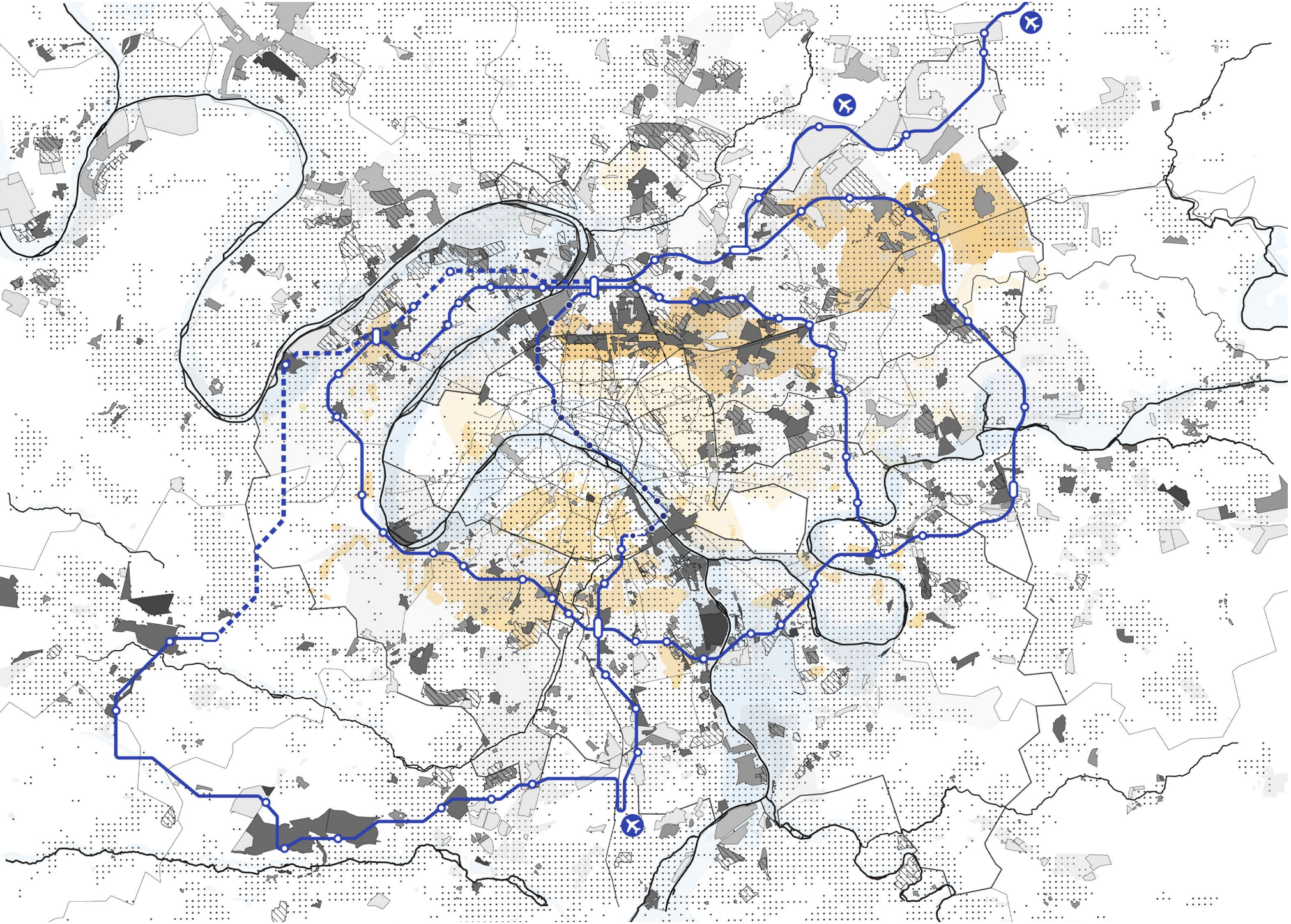
Paris is a city built on historic layers of habitation. The city has a history of subsurface interventions to sustain urban life at the surface: from underground quarries (construction materials) dating back to the Antiquity to utility systems (sewage, drinking water…) in the 19th Century, to mobility corridors (metro, trains, and highways…) in the 20th Century. The subsurface of the Parisian region has been characterized as a 'gruyere' denouncing the multiple subtractions made by humans underground. Currently, the city is experiencing an entropic urban redevelopment period driven by municipal ambitions for connectivity, accelerated by the forth-coming Olympic Games in 2024, and supported by a new peripheral underground transit system currently under construction: the Grand Paris Express. This underground metro system will double the length of the current Parisian Metropolitan system (200km). It will serve as a connector beyond the Boulevard Périphérique, linking the region' s main international airports, disenclaving various 'disinvested' neighborhoods, and reducing the need for automobile transit within the metropole. This transit system has become a catalyst for housing and office construction – transforming entire neighborhoods in the Parisian periphery. Since the formulation of the Grand Paris project in 2007, the city and its periphery have undergone a drastic evolution aiming at consolidating the unity and connectivity of the metropole and projecting it as a competitive economic region.

Grand Paris Entropic Construction

Current subsurface and surface presence in the Grand Paris and its projected composition after urban renewal and redevelopment.



Micro-scale Map 1:130 000



04 ATLAS OF DECONSTRUCTION
04.03 HABITAT

Alteration

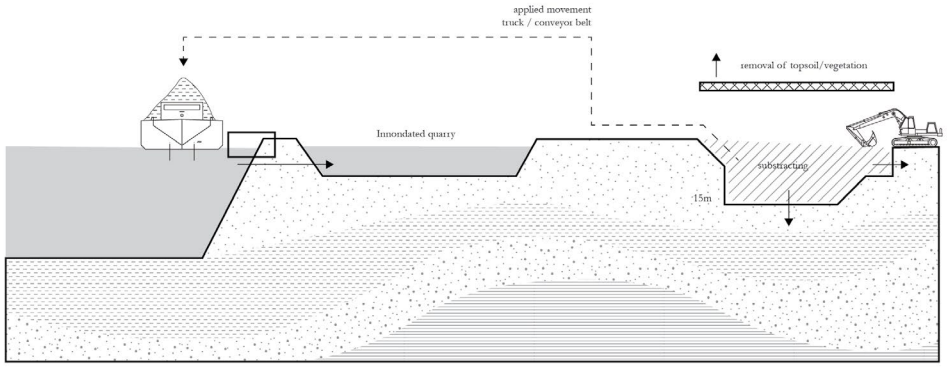
The section views outline three landscapes that derive from the construction processes in the Grand Paris: sites of material extraction (most notably alluvial aggregate and gypsum for concrete), urban spaces (where demolition, construction, and underground excavation occurs), and sites of debris (where excavated matter and construction waste are placed, sorted, and given another undefined purpose). The construction of urban space, therefore, requires the modification and operationalization of other landscapes far from the construction site. In the case of Paris, these landscapes are primarily linked by fluvial waterways (40%), favored over rail and road when possible. The process of urban renewal showcases urban spatial competition – as 'obsolete' building typologies are demolished and investments boost the construction of favored habitats. In order to make room for the new underground transit system, a titanic volume of soil is being excavated and is in need of storage. Fields outside of the city boundaries have been converted to temporarily store the excavated matter. These sites and this matter represent the undervalued and discarded residuals of urban development. The externality of the construction process is the debris. The landscapes of debris have their own unique cycle as subjected to the forces of anthropogenic and economic will – where life span is undetermined and fertility and usage not applied.

Diagramatic Sections of the Urban Construction Landscapes

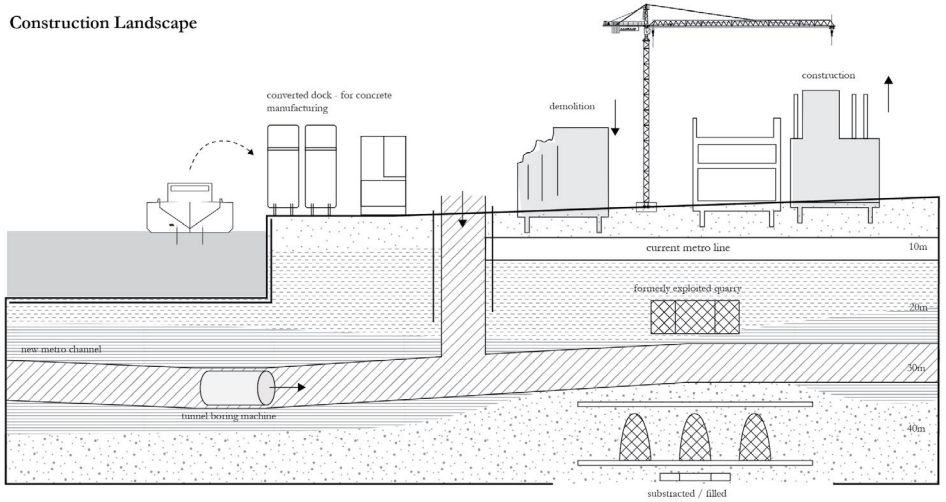
The three landscapes (simplified) of urban development: the extraction, construction, and demolition/ storage landscapes.

Micro-scale Section

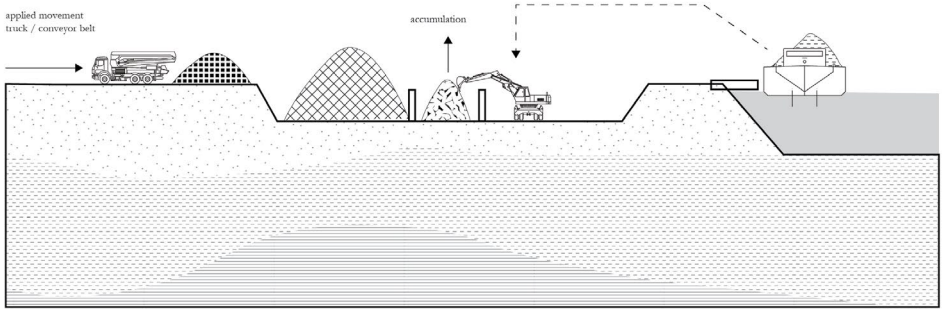
Extraction Landscape



Construction Landscape



Debris Landscape



04 ATLAS OF DECONSTRUCTION
04.03 HABITAT

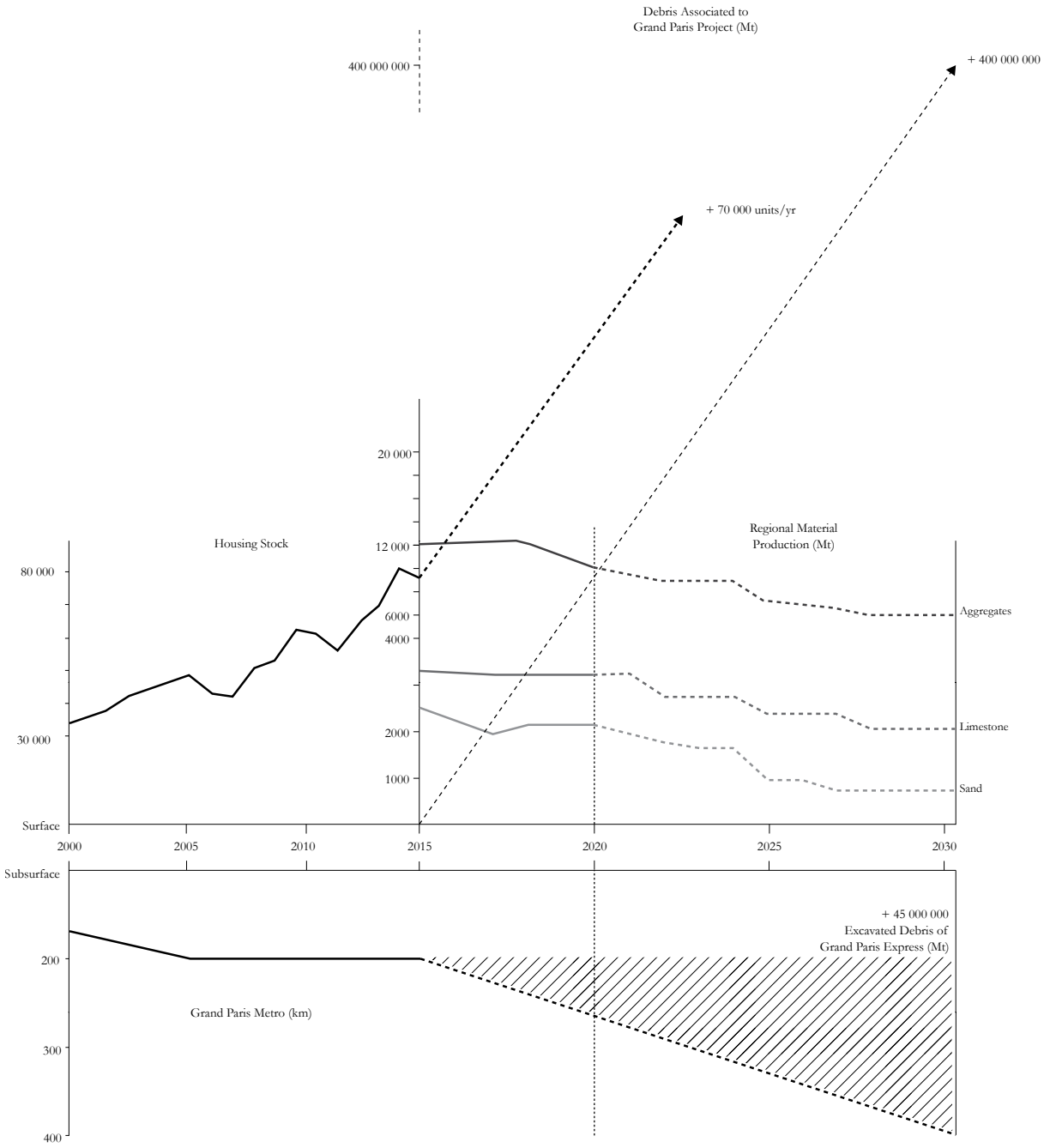
Limits

The process of urban development triggers immense social, ecological, and economic repercussions – most of them thought out in a top-down approach. But the physical reality of development poses clear limits and challenges. Urban development is first and foremost a physical and material endeavor. The Grand Paris Express and the related neighborhood constructions are creating a great demand for construction materials and producing enormous amounts of debris. It is estimated that more than 200 million tonnes of debris associated with acts of construction, demolition, and excavation will be produced each year between 2015 and 2030. This represents about four pyramids of Giza of debris produced each year for about 15 years (Data Lab, 2017). These land-masses, their logistics, and their future usage represent some of the biggest challenges associated with the Grand Paris project. The physical realities of urban development also relate to the production of construction materials. As materials like gypsum and alluvial aggregates are non-renewable mineral resources, regional reserves are slowly depleting. The diminishing availability of local materials questions the future of construction and its incessant use of resource-intensive and highly polluting concrete as a foundation for urban development

Material demands of habitation trends

The 21th Century is marked by a massive urban development project examplified by a new urban regional transport system and a mass building campaign.

Diagram


Debris Associated to
Grand Paris Project (Mt)
400 000 000
+ 400 000 000
+ 70 000 units/yr
20 000
12 000
6000
4000
2000
1000
Housing Stock
Regional Material
Production (Mt)
80 000
30 000
Surface
Aggregates
Limestone
Sand
2000
2005
2010
2015
2020
2025
2030
Subsurface
+ 45 000 000
Excavated Debris of
Grand Paris Express (Mt)
200
300
400
Grand Paris Metro (km)

04 ATLAS OF DECONSTRUCTION
04.04 GEOPOLITICS

Climate regime, ethics, ownership, displacement

Catalogue

01. Carbon form
Habitation and infrastructural organization around fossil fuel dependent processes

02. Urban development emissions

03. Surface, subsurface, and landscape ownership

04. Migration and socio-cultural diversity
Urban uprisings, spatial segregation, immigration

05. Economic occupation
Old industrial, new industries

06. Projection and planification
Projections of space into 21st century

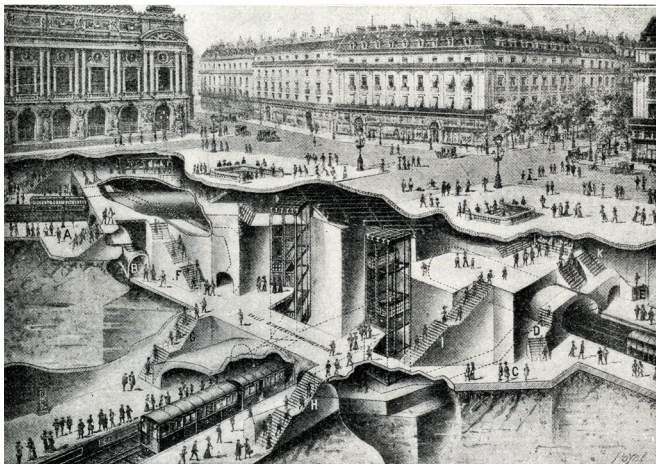
Shortlist

01. Territorial occupation and ownership

02. Centralization

03. Development externalities

Opera Underground cross section,
Magasin Pittoresque (1852)



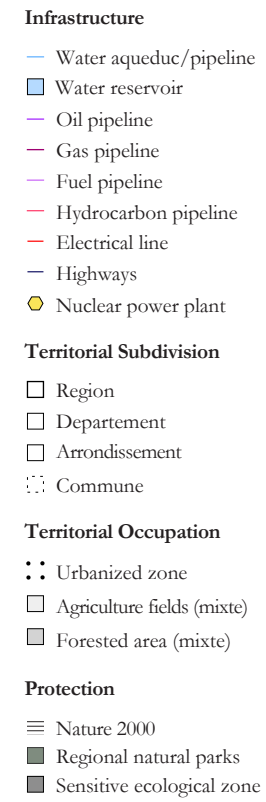
Les tours a Sarcelles,
Mélodie en sous-sol (1962)

04 ATLAS OF DECONSTRUCTION
04.04 GEOPOLITICS

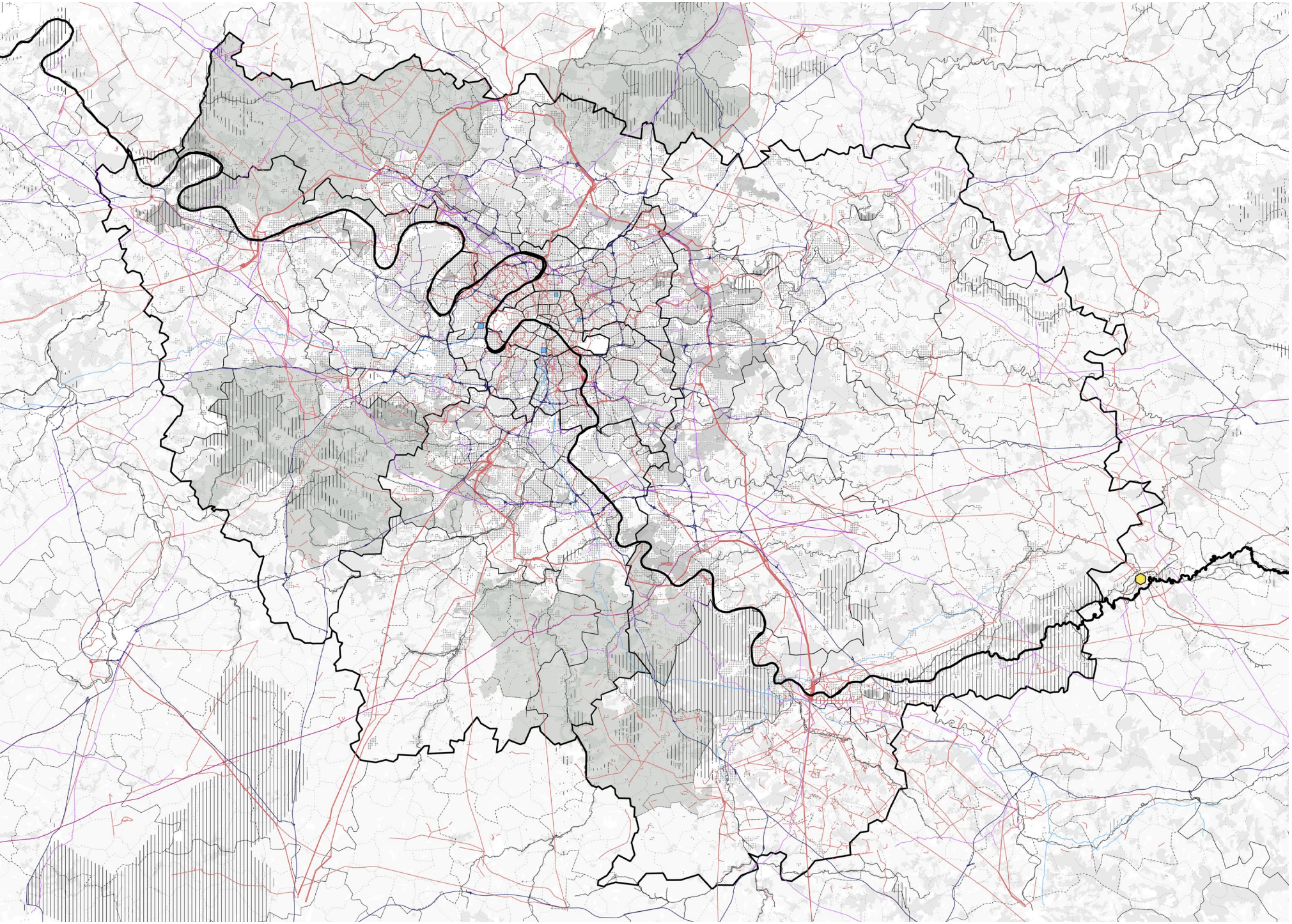
Composition

France as a territory has been fully operationalized to respond to anthropogenic demand. As a result of that, landscapes have been drastically transformed by humans over time and have restructured ecological dynamics. This fact has led scholars such as Jean Jacob to describe France as the 'land of artifice' (Jacob, 1999). The claim to a territory – the territorialization of space – implies a superposition of control on the landscape through various actions and spatial markers: the creation of boundaries, borders, measurements, land-use changes, resource appropriation... These acts are political as they are met with a clear intention. In France, they allow the possibility to govern a territory through a centralized state and to polarize energy and resources towards the primary spaces of political and economic production: the urban area of Paris. Artificially applied landscape dynamics – counteracting embedded processes - are only possible through an elaborate infrastructural system that allows for the control of movement that goes beyond geographic realities to sustain economic and political rationale.

Operationalization of the Ile-de-France



Meso-scale Map 1:400 000



04 ATLAS OF DECONSTRUCTION
04.04 GEOPOLITICS

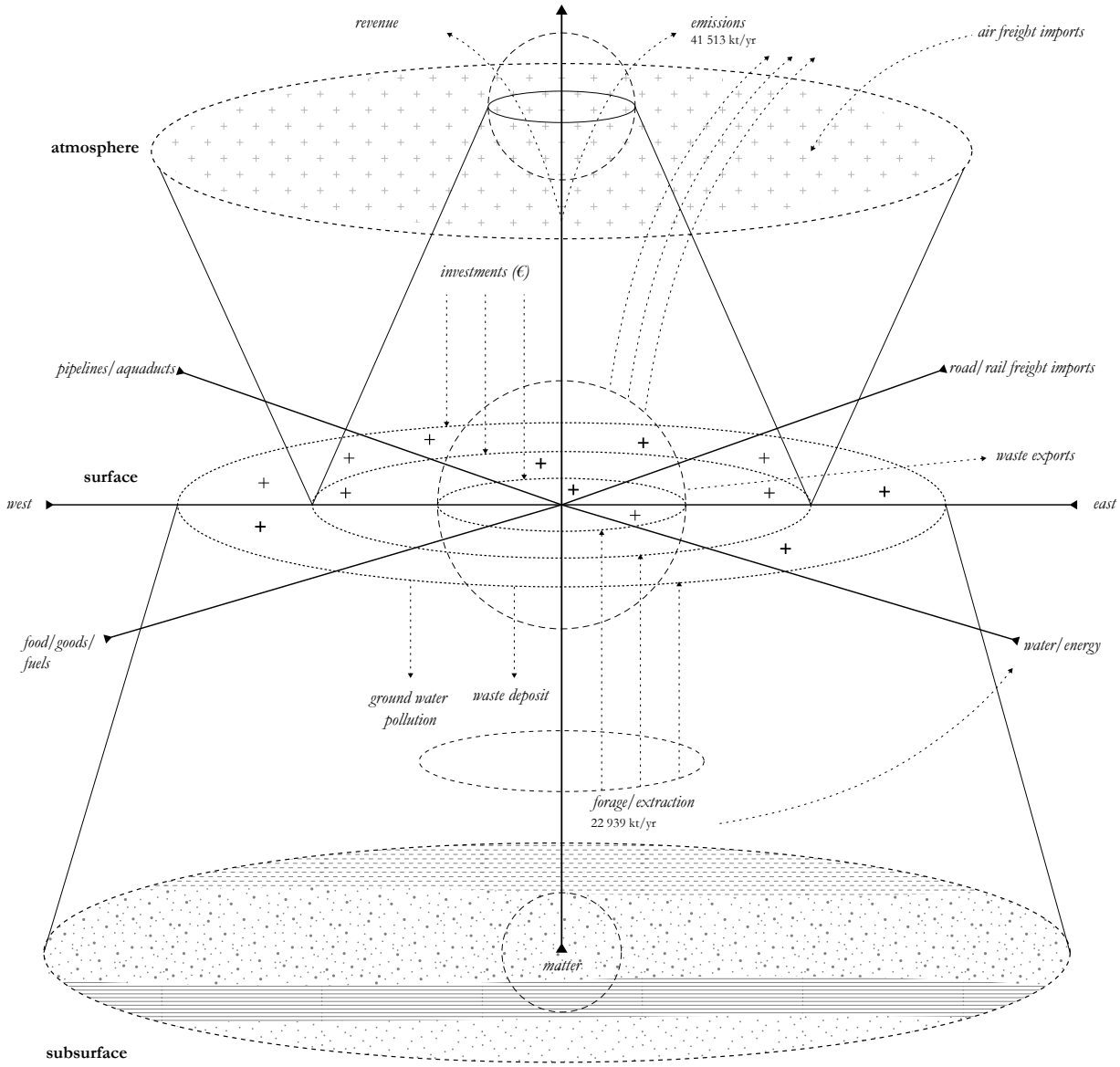
Alteration

The Grand Paris, as a productive urban space, is sustained by the larger territory it borrows from. A territory such as the Seine River basin has few geographic limitations. Its relatively even terrain and absence of topographic obstacles makes it a rather attractive landscape to claim and occupy – exemplifying the effects of western territorialization when physically unrestrained. The concentration of power and population in the capital has generated a point of gravity towards which resources lead to and where wealth is produced. This results in an extremely uneven distribution of access, resources, and investments. This power dynamic has long been present on this territory. Major infrastructural works started in the 18th century, in the name of modernization, to provide for the artificial urban landscape of Paris (most notably waterworks, and sewage systems attributed to Baron Haussmann). In our current fossil fuel-powered economies, this centralization has particularly accentuated externalities such as CO2 emissions, heavy industrial production, truck traffic, and other fluxes which are themselves redistributed unevenly as they infiltrate water systems and are spread through the air.

Centralized Urban Landscape Metabolism

A 4-axis depiction of the Parisian metabolism acting as a gravitational force on the territory.

Diagramatic Section


revenue
emissions
41 513 kt/yr
air freight imports
atmosphere
investments (€)
pipelines/ aquaducts
road/ rail freight imports
waste exports
surface
west
east
food/ goods/ fuels
water/ energy
ground water pollution
waste deposit
forage/ extraction
22 939 kt/yr
matter
subsurface

04 ATLAS OF DECONSTRUCTION
04.04 GEOPOLITICS

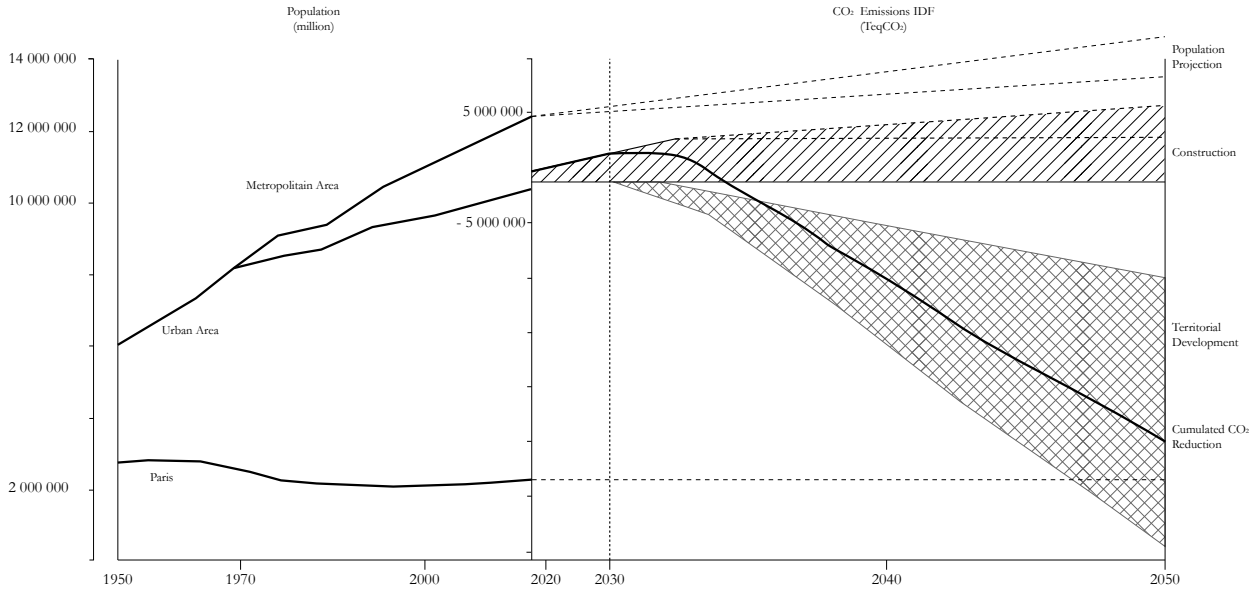
Limits

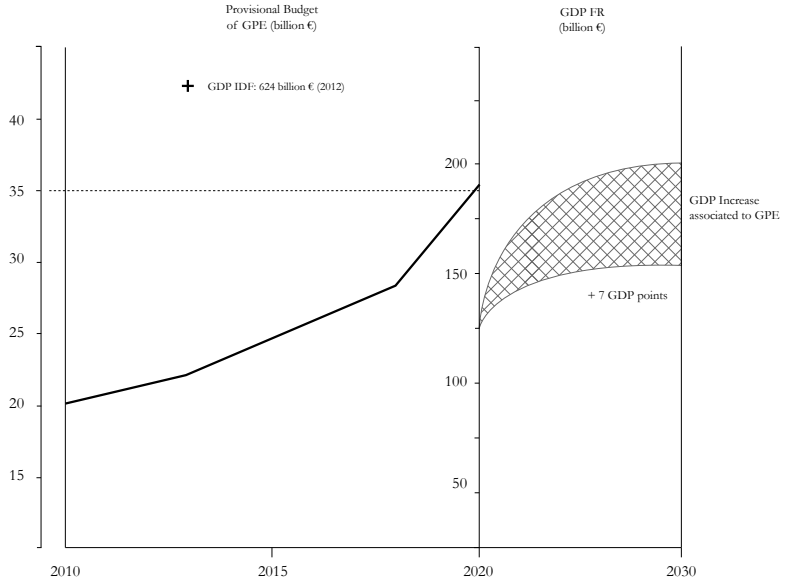
Spatial development, rearrangements, extensions, and connectivity are processes that most often derive from infrastructure projects (mobility, energy...). These systems are intended to facilitate usage, boost economies and competitivity, and sustain high-density areas. Urban developments, much like infrastructure projects, are political acts of territorialization. These processes are dictated by intentions (economic, social, ecological…) and pose claims (ownership) on urban space (buildings, public space…) by the very idea that they can and should be changed. These actions are done to gain control over communities and spaces, deciding where one may live, where one may work - and dictating a path towards productivity. The Grand Paris redevelopment projects follow the same structure. The restructuring of space through the creation of a new mobility infrastructure is intended to project a growing urban area into a continued age of productivity. While no judgment is placed on the intentions of the project, urban development as a geo-political act raises some questions. Are there limits to resolving climatic, environmental, and social issues through the act of building? Is a new climatic regime one that solidifies anthropogenic territorialization and control over the landscape with an alternative intent? And can population and economic growth be coupled with ecological rationale within the urban frameworks that are already in place?

Trends and CO2 emissions reduction patterns attributable to redevelopment projects

Local construction and territorial development projects and their intended impacts to mitigate greenhouse gas Emissions.

Diagram


Population
(million)
CO₂ Emissions IDF
(TeqCO₂)
14 000 000
12 000 000
10 000 000
2 000 000
5 000 000
- 5 000 000
Metropolitain Area
Urban Area
Paris
Population
Projection
Construction
Territorial
Development
Cumulated CO₂
Reduction
1950
1970
2000
2020
2030
2040
2050


Provisional Budget
of GPE (billion €)
GDP FR
(billion €)
GDP IDF: 624 billion € (2012)
40
35
30
25
20
15
200
150
100
50
GDP Increase
associated to GPE
+ 7 GDP points
2010
2015
2020
2030

04.05 PROJECTION

THE CONSTRUCTED LANDSCAPE, A PROBLEM-FORMING MANISFESTO

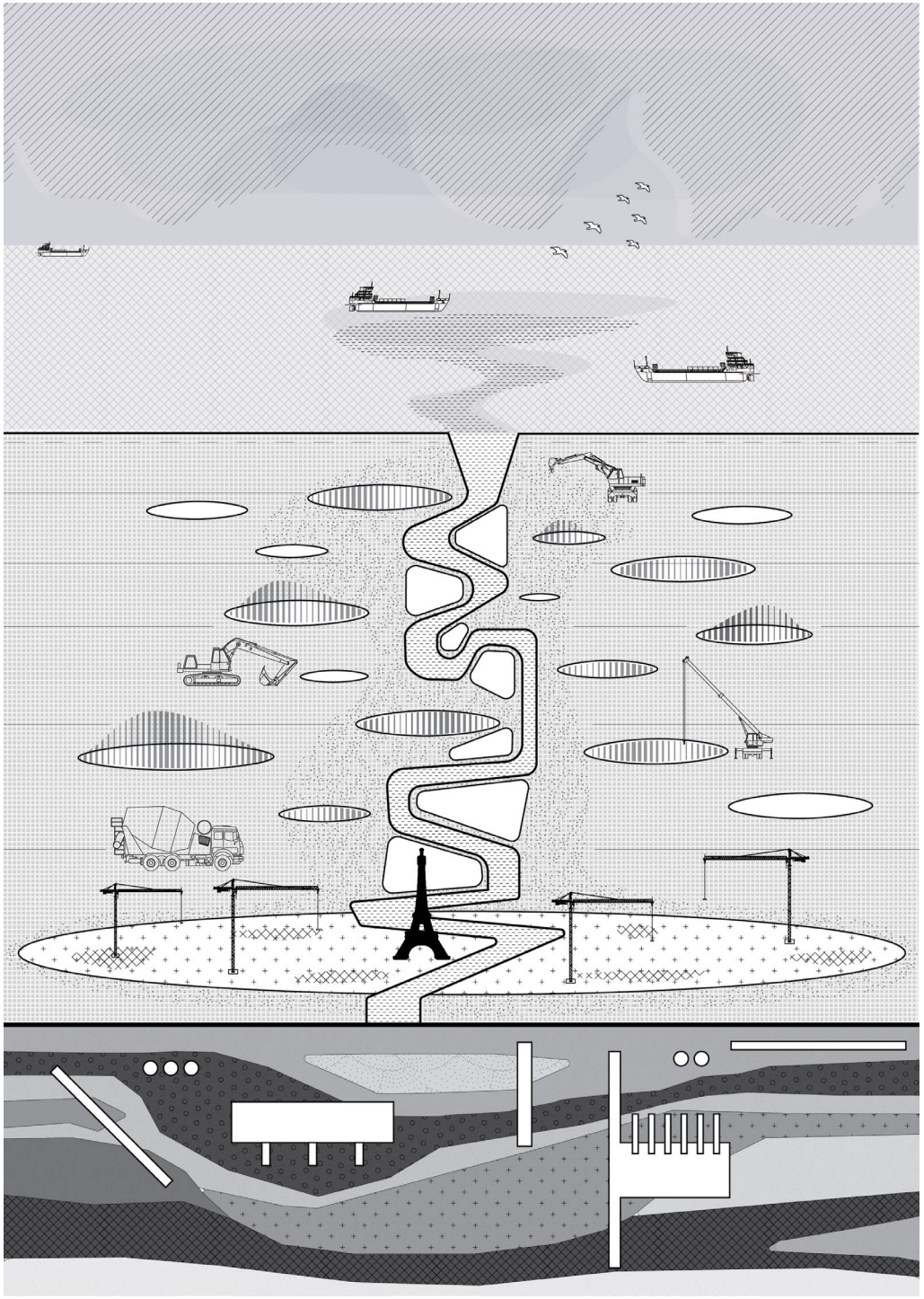
The urban project is a construction.

It is rooted in a political project: an affirmation of the anthropogenic territorial dominance.
Aided by an engineering project: a physical modification of the landscape to service production.
Yet human habitat is primarily Earth.

Earth as a matter: a physical translation of spatio-temporal dynamics that have now been moved, altered, and commodified.
Earth as a space: a borderless field of interactions that has now been politicized, artificialized, and contaminated.
As we realize the scale of our artifice and the climatic and ecological externalities of urbanization, an alternative consideration needs to be applied to the process of constructing the urban.

A dismantling of the geographically irrational divide between city and hinterland must be actively thought out - as the connection between spaces of consumption, production, and disposal are inseparable. The link between surface and subsurface must be fortified as it is the basis for earthly fertility. The dynamic relationship between land and water must be cultivated as it is vitally constructive and irreplaceable.

Landscape urbanism has now to be thought of as a process from inland, seawards: from geological archeology to geographic reality. A practice where Matter, Space, and Culture are coevolutionary with Ecology within the physical planetary limits we are bounded to.



04 ATLAS OF DECONSTRUCTION
04 CONCLUSION

To what extend is the urban project of the Grand Paris a territorial project in the Seine River Basin?

The Serving and the Served Landscape:

(1) Associating Geological Composition with Mineral Extraction: from matter to material

(2) Artificializing the River for ease of navigation and trade created a casade of complications: the acentuation of flood risks and need for further artificialization, the deterioration of non-human habitat, and the suppresion hydrological and geological processes (sedimentation)

(3) Growing urban demands for housing (and miss-management of existing stock) are further developing a utilitarian perspective of the river as a source of material

(4) The Grand Paris, due to its concentration of 'urban' has centralizated flows and infrastructures and has become an anthropogenic gravitational point in the watershed

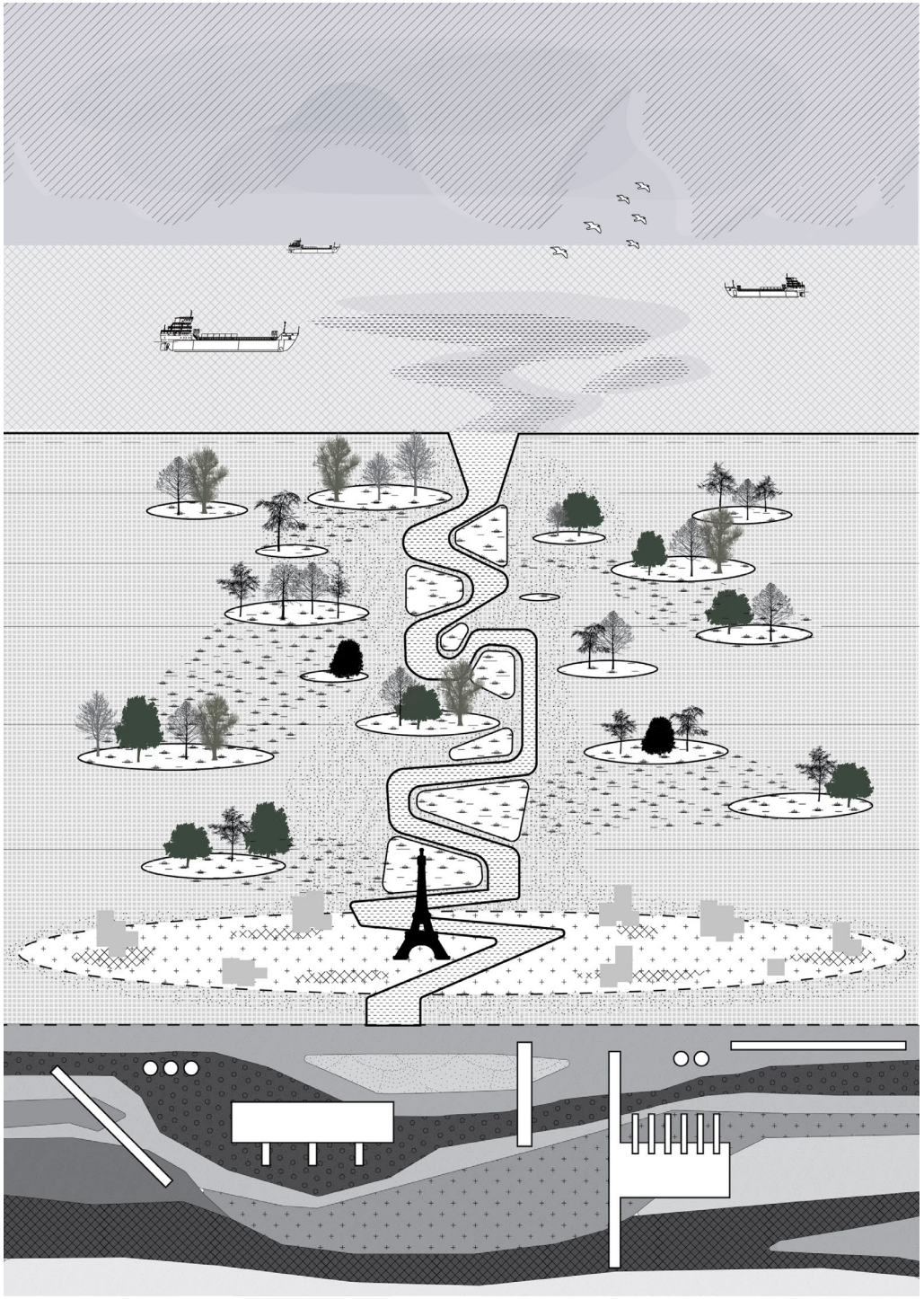
Damaging Territorial and Urban relationship:

(1) An uneven exchange of benefits and externalities

(2) The onthological modification of more-than-human systems functioning

(3) The significantly altered landscapes with a single use perspective

What interventions could serve to counter act these processes?
What framework and material practice would be needed to offer relief and propose alternatives to the construction of the urban project - through the lense of the territorial and the Seine River?



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05 FORENSIC EXPLORATION

05 FORENSIC EXPLORATION
05 INTRODUCTION

What are the socio-ecological and physical apparatus of The Grand Paris urban transition?

The forensic exploration performs as, Leopold Lambert (2020) states, “excavation of the various strata of the political geology of the Grand Paris” by creating a relational analysis between political agendas, urban developments, and matter.

The goal of this section is to Politicize Matter through

(1) the socio-political and cultural forces applied on matter: by governing bodies and through time

(2) the material apparatus and spatial externalities of urban development: relating for the large scale urban transition occuring in the Grand Paris today.

This exploration moves through space and scales - from the city to the territory to the particle of matter used in the prodution of concrete.

La Tour Eiffel
Sols Paysage (2020)

Conceptual Drawing of Matter
Hadrien Cassan (2021)

05 FORENSIC EXPLORATION
05.01 CRISIS AND URBANISM

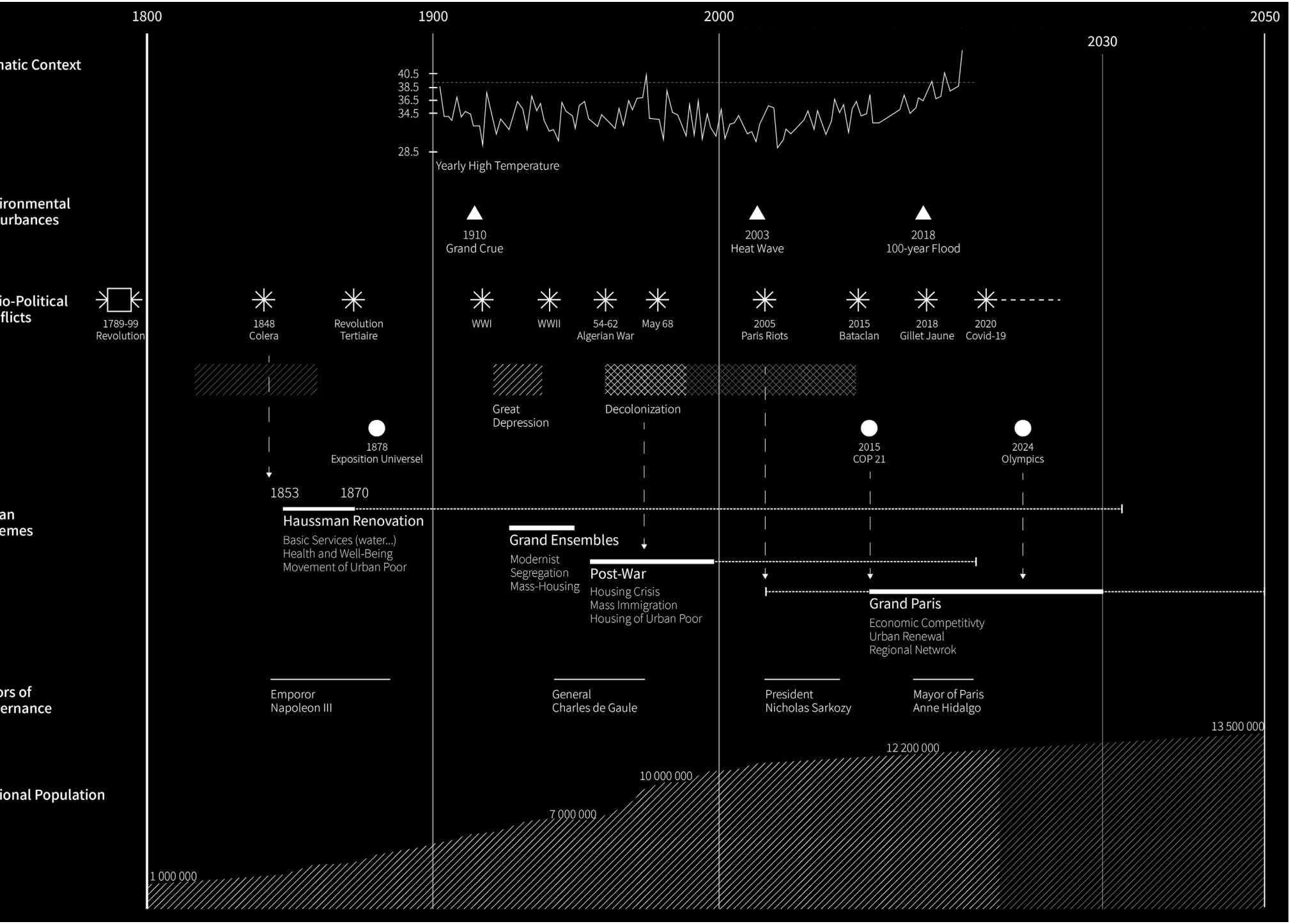
Crisis as an Catalyst for Transition

While there are sanitary, economic, basic services intentions, there are always quite significant social and cultural draw backs : segregation, community desruption, non-community centered solutions (top-down over bottom up) This timeline looks at revealing correlations of clashed between societal struggle and political agendas which have led to massive urban changes in Paris.

The city is historically known for its urban transformation embarked by Baron Haussmann. With hopes to democratize services (such as drinking water) and provide adequate sanitary conditions in the mid-evil urban spaces... Haussmann also proceeded to increasing injustice in the city, economic seperationalism, marginalization...

The post-colonial era was also a double edge sword. With the intension to house a growing population after the liberation of Algeria and other Magrebian nations... The mass housing complex called HLM were also synonymous to segregation, and efficiency over livability.

Today the Grand Paris Project is potentially charged in gentrification risks between both a short-term vision to clean up the city for the coming Olympics - and a long rem vision to project the city into the 21st century as a hub for sustainability, and modern-urban economies.


1800
1900
2000
2050
2030
natic Context
40.5
38.5
36.5
34.5
28.5
Yearly High Temperature
ironmental
urbances
1910
Grand Crue
2003
Heat Wave
2018
100-year Flood
io-Political
flicts
1789-99
Revolution
1848
Colera
Revolution
Tertiaire
WWI
WWII
54-62
Algerian War
May 68
2005
Paris Riots
2015
Bataclan
2018
Gillet Jaune
2020
Covid-19
Great
Depression
Decolonization
1878
Exposition Universel
2015
COP 21
2024
Olympics
an
emes
1853
1870
Haussman Renovation
Basic Services (water...)
Health and Well-Being
Movement of Urban Poor
Grand Ensembles
Modernist
Segregation
Mass-Housing
Post-War
Housing Crisis
Mass Immigration
Housing of Urban Poor
Grand Paris
Economic Competitivty
Urban Renewal
Regional Netwrok
ors of
ernance
Emporor
Napoleon III
General
Charles de Gaule
President
Nicholas Sarkozy
Mayor of Paris
Anne Hidalgo
13 500 000
12 200 000
10 000 000
7 000 000
ional Population
1 000 000

05 FORENSIC EXPLORATION
05.02 URBAN POLITICS

La Seine (Departement)

In 1790, after the great 1789 revolution and the 'Prise de la Bastille', Paris was incorporated into the Department of the Seine. This political classification facilitated decision making and applied a sort of control on the processes undergoing in the capital. In 1968, and before the famous May '68 protests, the department was dissolved and the urban region split into four smaller departments: Paris, Hauts-de-Seine, Seine-Saint-Denis and Val-de-Marne. This was in part due to its growing population (5,700,754 residents in 1968) which made the Seine 'too large to be governed effectively.' While this subdivision could have made sense at the time, it was also linked to other national dynamics unfolding. After the Algerian War which ended in 1962, large waves of immigrations from former-now-independent-colonies were arriving in and around Paris. The Seine could have therefore been divided as to separate communities living in the center of the city and group the newly arriving, often poorer immigrant families in the peripheral departments.

In complete political transparency, the newly established Val-de-Marne, to the southeast of Paris, was assigned the official number 94, a number previously used for a territory in the southern part of French Algeria. To the west of Paris, the Hauts-de-Seine was attributed the official number 92, a number previously used for the department of Oran in French Algeria. Finally, to the northeast, the Seine-Saint-Denis department was given the number 93, a number previously used for the department of Constantine in French Algeria. While no generalization wants to be made here, today, these 3 departments are home to the largest communities of immigrants from northern Africa in Europe.

Metropole du Grand Paris

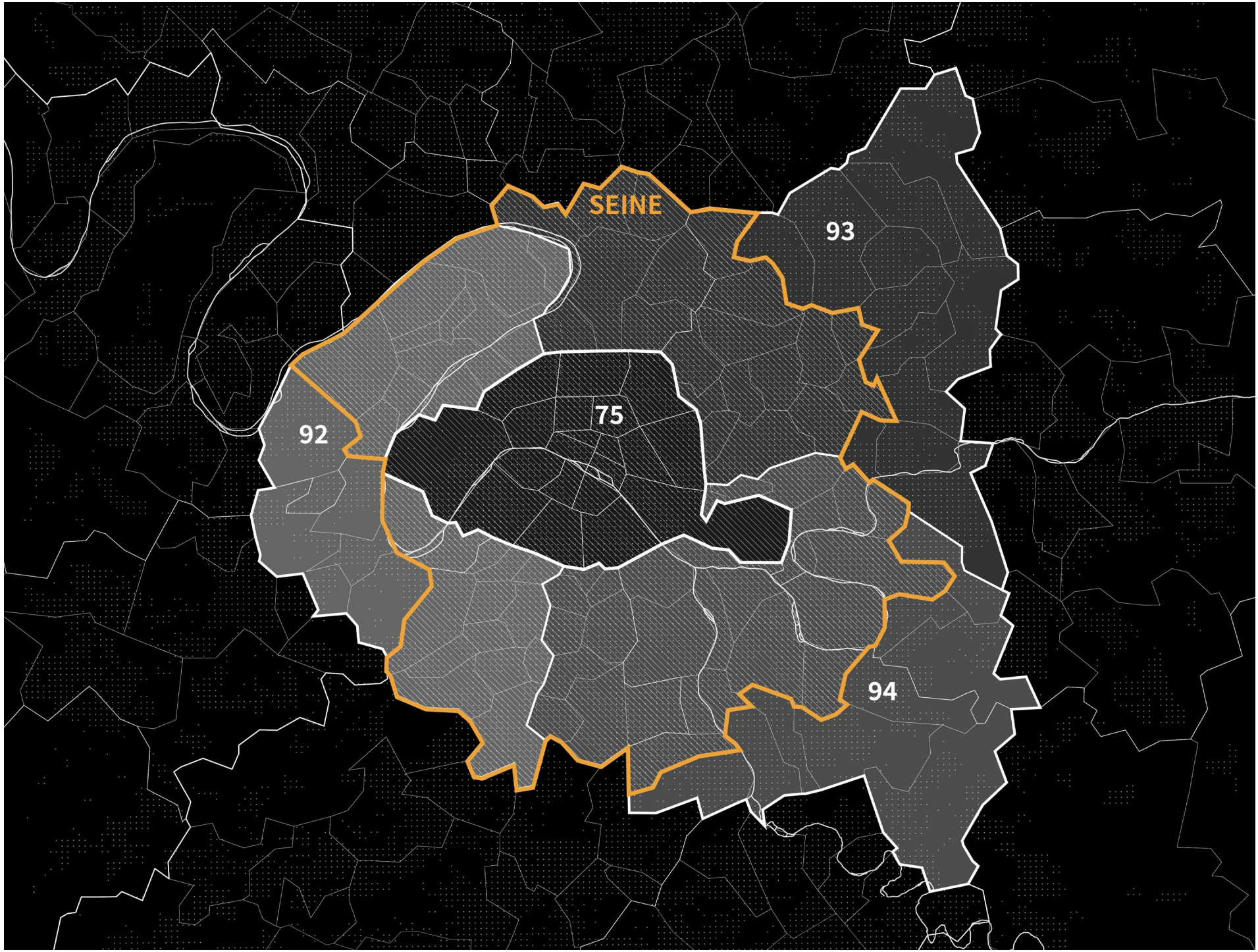
Today, the continuous urban region of Paris has a population of more than 11 million people, still subdivided into the center, the small crown (Petite-Couronne) and the big crown (La Grande-Couronne). In 2016, a new regional political classification was adopted following the will to reconnect the fragmented urban area: the Metropole du Grand Paris which comprises the 75, 92, 93, and 94 following more or less the same perimeter as the former dissolved Seine department. Today, over 7 million people inhabited that area. Has our political structure made it easier to governor effectively such a large population?

Territorial Subdivision

- Seine (departement) - 1790-1968
- Region
- Departement
- Arrondissement
- Commune

Territorial Occupation

- Urbanized zone


SEINE
93
75
92
94

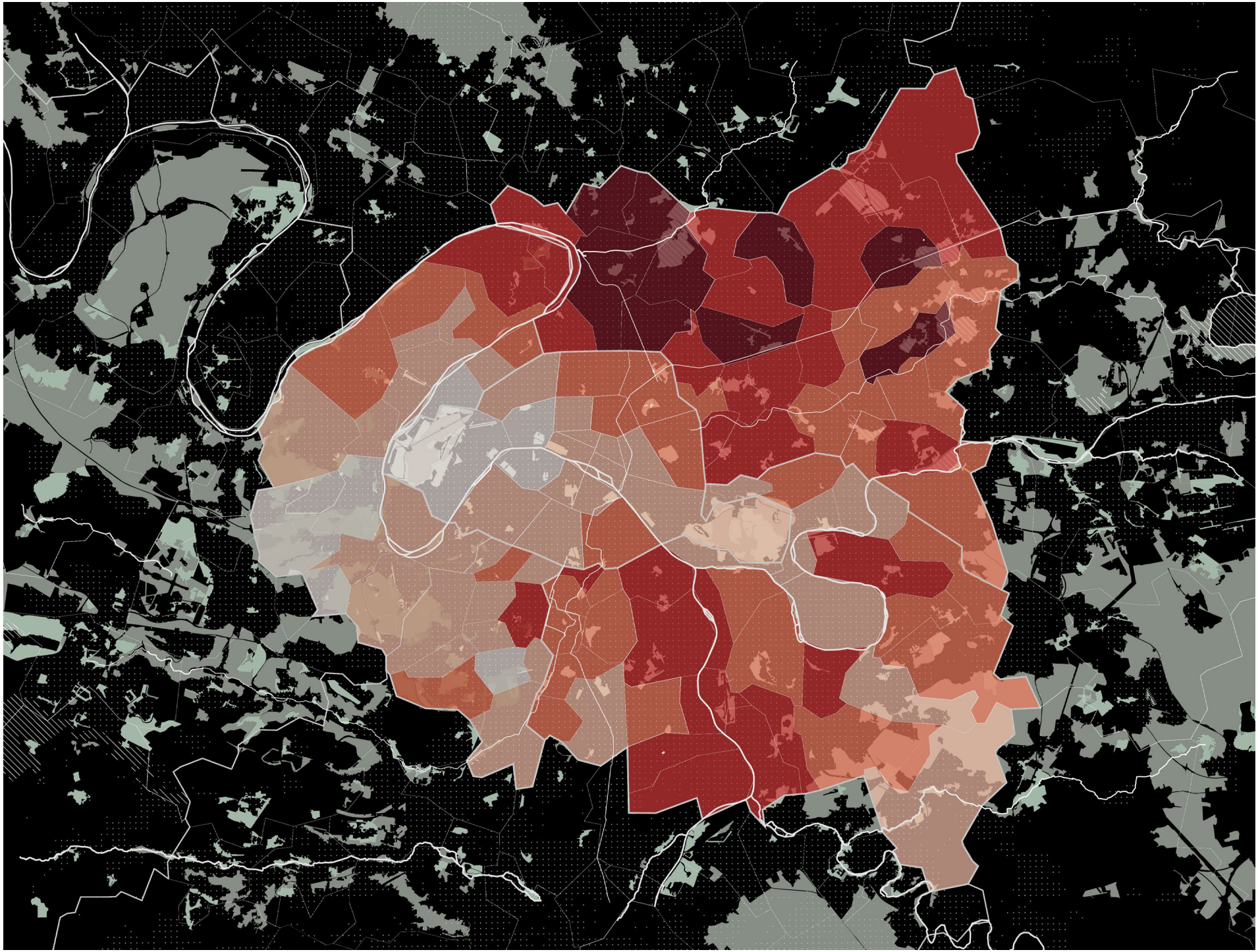
05 FORENSIC EXPLORATION
05.02 URBAN POLITICS

Socio-Economic Landscape

Much like the process of territorialization, urban development is synonymous to a political appropriation and control of space. Urban redevelopment constitutes a spatial reconfiguration of socio-economic forces to best serve a specific agenda drafted by bodies of governance.

In the Grand Paris, many agenda' s overlap to drive the overall urban vision. The main one looks to fight against the 'enclavement' of specific 'at risk' neighborhoods. These spaces of inhabitation in the periphery of Paris cluster disadvantage communities as a result of former urban politics. From 1960s to the early 2000s, urban strategies focused primarily on the concentration and alienation of immigrant populations, offering little possibilities for work and social ascendance. This has led to the current situation of uneven development opportunities and social vulnerability. The index, used to classify these regions in the red gradient looks at mean-salaries, unemployment rates, and education levels. The Seine-Saint-Denis to the North, a largely former industrial and disinvested area is one of the most 'at-risk' urban regions of France, it is notably plagued by the highest national unemployment rate for under 30s and large occurrence of illegal activities and crimes.

These vulnerable clusters are notably a result of the architecture and the concentration of HLM (Habitation à Loyer Modéré) or low-income housing. Often large modernist inspired towers, made primarily out of concrete due to its popularity after the war (bunker architecture) and its rapid implementation, disregarded human principles and looked at housing populations first before cultivating communities. Visions such as Le Corbusier' s Plan Voisin in the early 1925 offered this grandiose non-human and object-oriented urban space, where flows of automobiles and goods circulated freely, and population were not to be seen. This specific plan, proposed for Paris, looked at demolishing most of the historic center to build organized and legible urbanscapes where singularity and efficiency dominated. The Franco-Swiss architect has been criticized for his radical approach and mechanical perspective of the city (common at the time of war and potential tabula rasa), but his ideas have persisted in the post-colonial era, and while he was not directly their architect, he was.



05 FORENSIC EXPLORATION
05.02 URBAN POLITICS

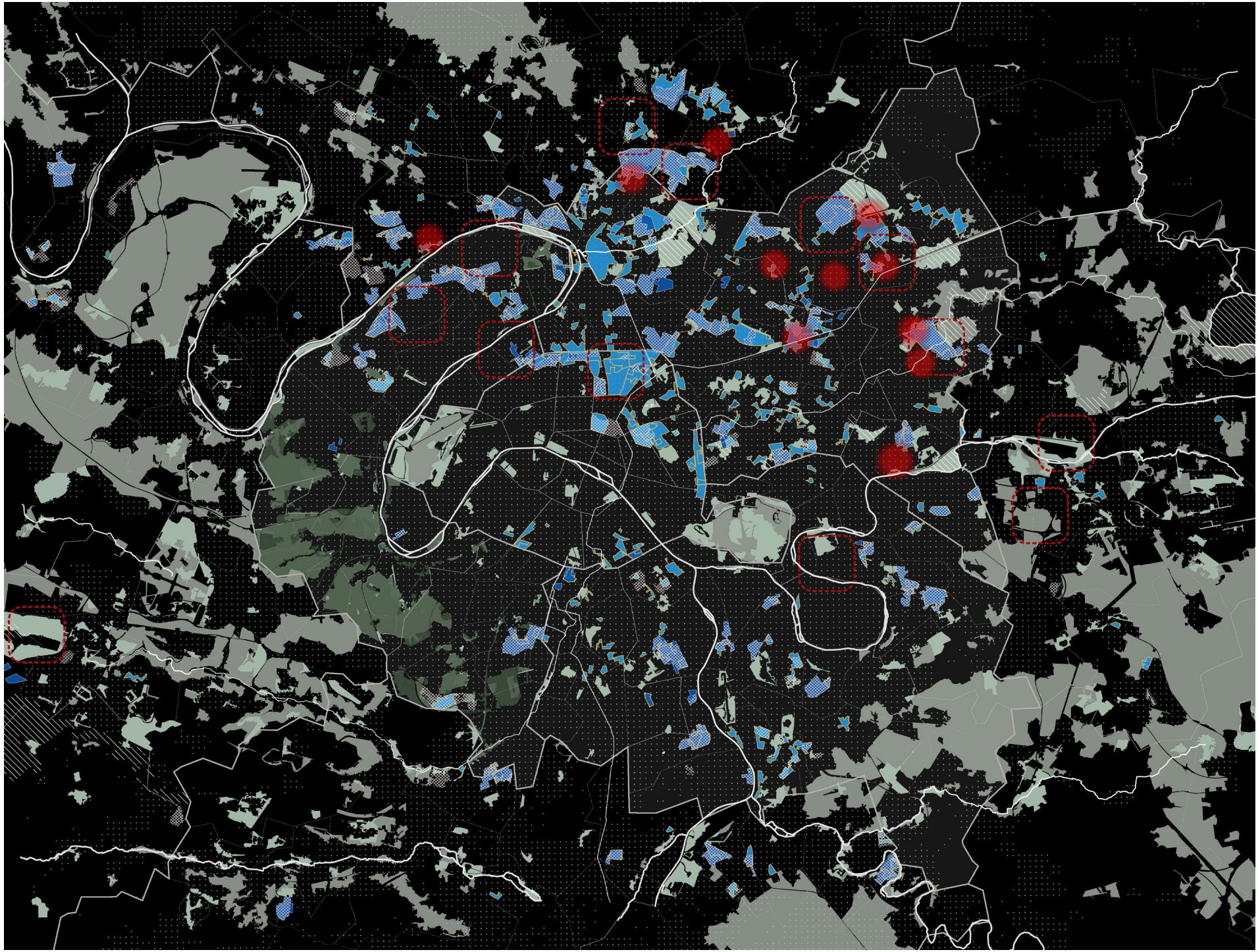
Social Landscape Disturbances

The enclaved neighborhoods have long been assimilated with ‘problematic’ behaviors: drugs, disobedience, vandalism, and violence most often portrait the young colored male which inhabits these places. While unemployment rates are high and opportunities scarce, youth that often born within precarious situations have trouble finding ways out.

In October 2005, a series of riots sprung out of Clichy-sous-Bois (93) after the death of two young boys, Zyed Benna and Bouna Traoré, after they escaped a police control. These riots quickly grew in importance and spread in the northern district of the Seine-Saint Denis, and soon across the nation. A State of National Emergency was declared on November 8th 2005 and lasted 3 months. The reason that I evoke these events is that they exposed to governing actors the potential for un-national behaviors. This brought about a renewed effort in creating a cohesive territorial space or at least intensifying control over certain zones. While the political rhetoric evokes social cohesion and growth of opportunities, some can see some political acts as an ‘anesthesia’ and ‘control’ toward an ‘organized’ peripheral space.

These at-risk zones, most often located in areas of high social vulnerably has through the years been classified by urban political programs such as the ZUS (Sensitive Urban Zone), ZRU (Urban Revitalization Zone) and the ZEP (Educational Priority Zone). These classifications hint at facilitating development in these areas at risk, most often to the detriment of communities. Since the 1980s a series of urban initiatives were set to internally reorganize dynamics, give better access to job opportunities, social housing but no large cohesive vision was brought forth which significant spatial implications.

The 2005 riots revealed to the political elites the real risk of this situation. Since then, QRRs (Quartier de Reconquete Republicaine) have been identified as territories needing increase police surveillance and security as to fight off delinquency.



newal)
Zone)
Zone)

05 FORENSIC EXPLORATION
05.02 URBAN POLITICS

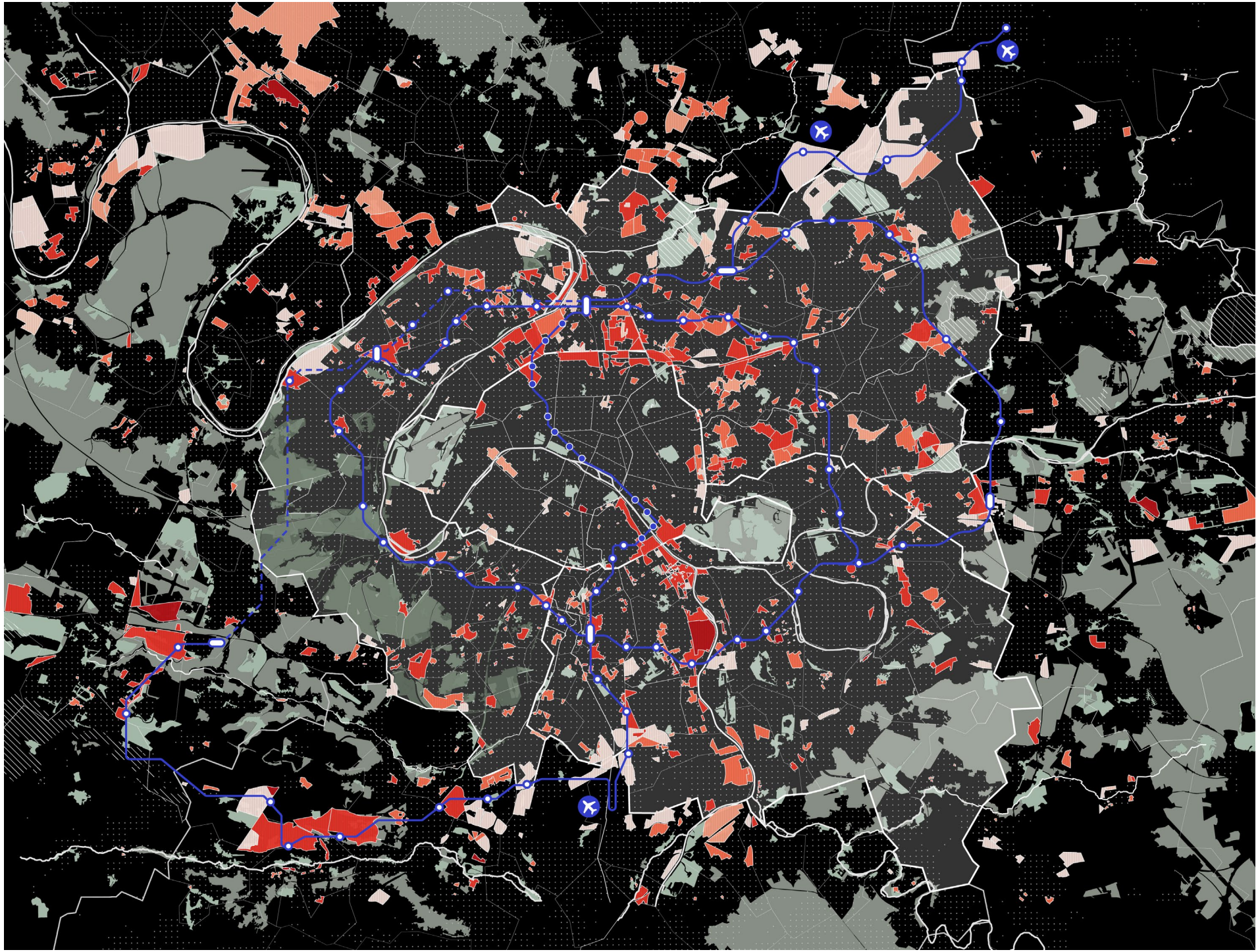
Urban Landscape Disturbances

The 2005 riots were taken as an opportunity by then-President Nicholas Sarkozy to propose the idea of the Metropole du Grand Paris. This political reclassification would offer the possibility to resolve socio-economic and cultural inequalities in the urban region, dismantle center to periphery separation and boost economic opportunities and growth for the city at the National scale.

The Grand Paris Express serves as the main infrastructural mobility network that would start connecting peripheral urban territories together creating a larger more interconnected urban region. This project is in part driven by a will to project the urban region of Paris beyond its borders and into the 21st century while disenclaving aforementioned 'at risk' neighborhoods. The new underground urban mobility would create the new ring road that would allow quicker movement throughout the entire urban region.

This political classification and mobility infrastructure also serve the purpose of promoting urban renewal and redevelopment schemes. This urban vision offers the opportunity to develop new neighborhoods around the 68 new train stations, creating many material actions such as demolitions, construction, and excavation all serve to fulfil of urban change. This has paved the way to urban change of the scale of the Haussmann Renovations.

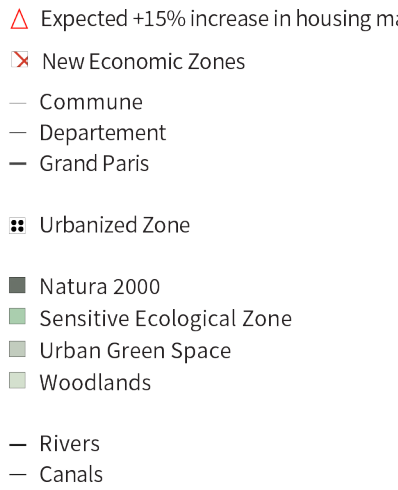
On top of the Grand Paris, the 2024 Olympics games are being held in the French Capital further increase large scale public-private partnerships and investments into urban infrastructure and renewal. While renovating and offer possibilities for communities to expand their potential is great, the current climate and rapidity under which all these changes are occurring, and juxtaposing begs to wonder the quality of the spaces that are being developed.

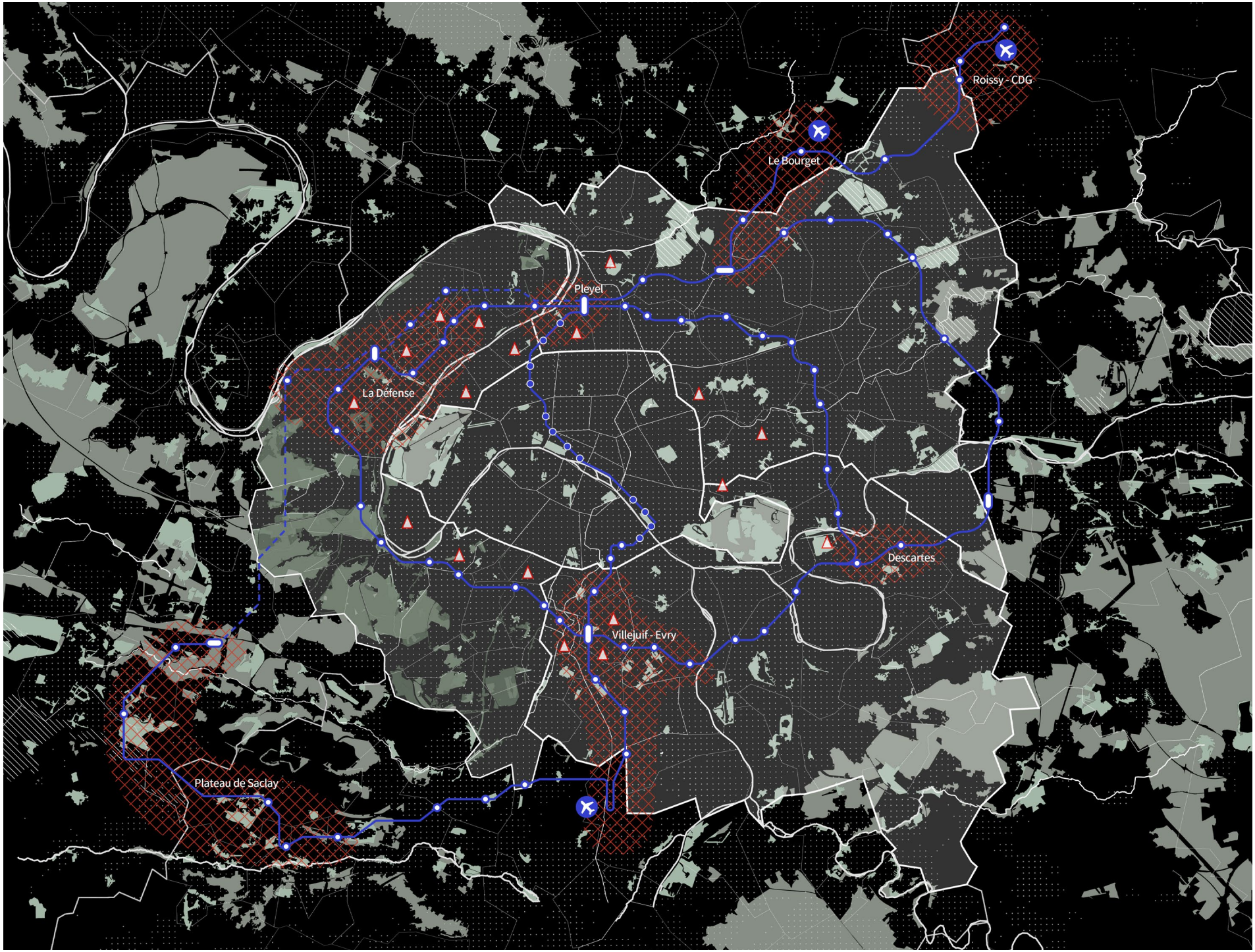


05 FORENSIC EXPLORATION
05.02 URBAN POLITICS

Economic Development

As previously mentioned, the Metropole of the Grand Paris supported by the Grand Paris Express expresses the considerable effort both public and private actors are operating with in order to propel the Parisian Urban Region into a new age of economic growth and prosperity. The urban vision looks to create new hubs for research and development and economic activity. Some of these hubs include the strengthening of La Defense, the Grand Paris' already established business district, located just to the West of the capital. This space holds within its 70+ skyscraper the headquarters of some of the country's largest multi-national companies. This space represents the consecration of globalized neo-liberal economies. The Plateau de Saclay is being considerably transformed into a space of innovation in academia and research. It will become the established educational hub of the Grand Paris. Most notably, the Grand Paris Express is connecting the region's largest airports – operating both commercial and cargo flights. This network exemplifies the intensions of the Grand Paris to accentuate its globalized, airport-connected, innovative, and financial identity not only within the national territory but beyond in Europe and in the world.




Roissy - CDG
Le Bourget
Pleyel
La Défense
Descartes
Villejuif - Evry
Plateau de Saclay

arket

05 FORENSIC EXPLORATION
05.03 URBAN MATERIALITY

From Political Agenda to Material Reality

Beyond the anthropogenic urban systems (social political and cultural) which are at play in the reconfiguration of the urban project, there are physical, ecological, and material requirements, impacts, and externalities of such a transition. Here it becomes primordial to step away from a spatial vacuum of the urban and look at the Seine Territory which supports Earthly systems that the city depends on for prosperity.

Matter endures a process of de-territorialization and re-territorialization – from geology to material to agent of political change.

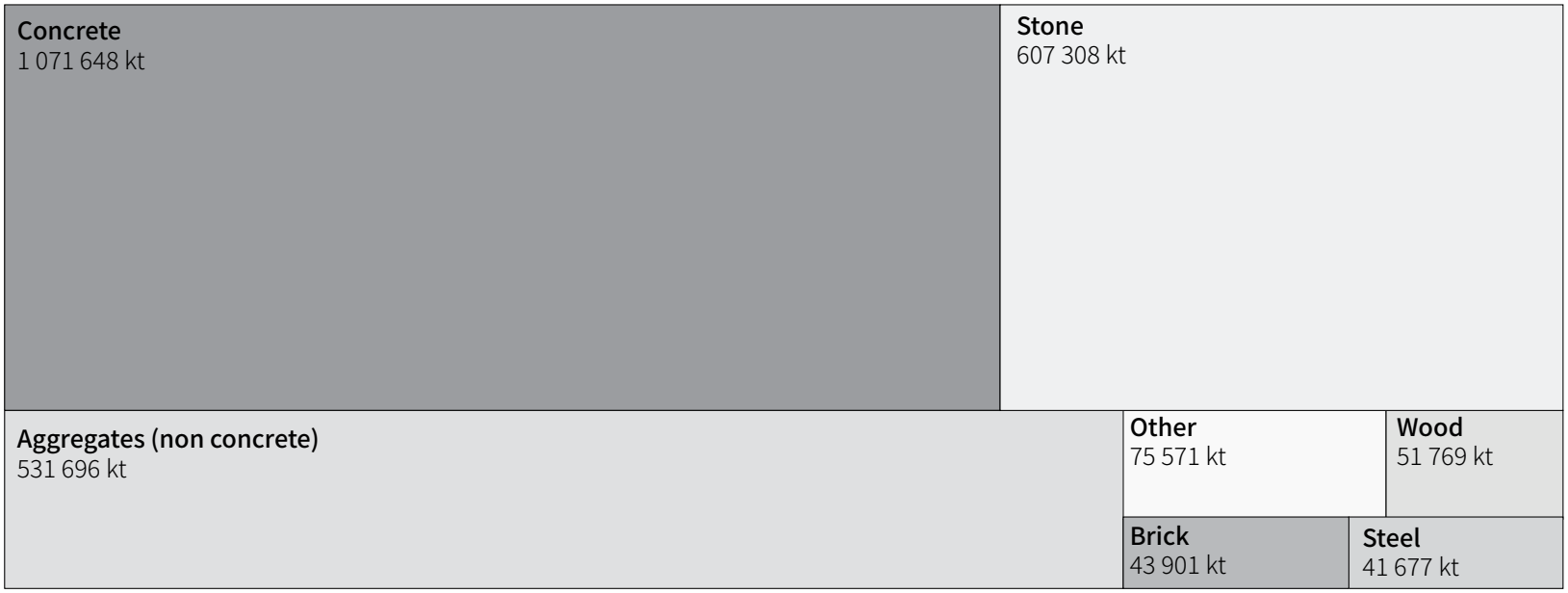
Construction and its associated physical requirements are used as tools to project spaces in societies in a precise way. The materialization of political agenda can become exemplary of the vision the body of governance has: from a precious and elegant marble to a cheap and fast producing concrete. From an imported to a locally sources material. From an wasteful and depletion mentally to a bio-sourced and frugal utilization of matter

This next section here will investigate the source of the urban designer' s material palette. Ruins are synonymous to hardship, struggle, but can also be painted with hope, and opportunity exemplifying lived and learned experience. Here cultural and historic appropriation of matter will be discussed. Matter here is seen as a design element, a lens to which to analyze space as to reveal the applied movements and uses dictated by political agendas.

Materials of Sao Paulo
Lara Almarcegui (2018)

There is a necessary link that exist and worth investigating between urbanization processes, urban form, and consumption of construction materials - they are all questions of urbanism.”

Sabine Barles (2008), translated by author



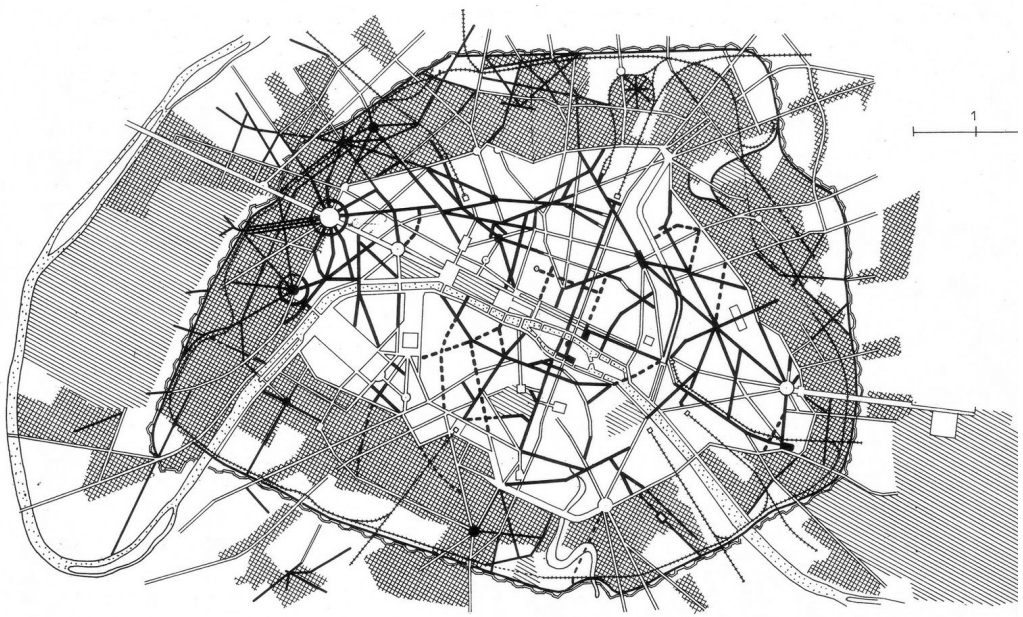
Materials Composition of the Parisian Region
adapted from Ile-de-France (2017)
Hadrien Cassan (2021)

05 FORENSIC EXPLORATION
05.03 URBAN MATERIALITY

Material Practice: 19th Century

During the mid-19th century, Baron Haussmann embarked on a historic urban renovation process that drew new roads through the French capital to transform it form a medieval to a modern industrial city of lights. On top of physical changes, infrastructures, notably drinking water pipelines and sewers, were installed changing the condition of habitation for Parisian. While this process was extremely disruptive – with large scale demolition occurring through Paris (roughly 12,000 buildings were torn down) – the choices made during that time and the buildings that were constructed still for the most part stand today. The Haussmann building was standardized but allowed for internal diversity (through different height ceilings). They were all united using cream-colored stones, locally sourced Lutetian limestone, which have become emblematic of 19th century Paris. These were quarries underneath the capital and in its periphery. As the city continued to expand, the underground limestone quarries have become and are still problematic. It has taken more than a century for most of them to be filled back up with debris or poured concrete.

Map of Haussmanian Interventions
Michel-Étienne Turgot (1734)

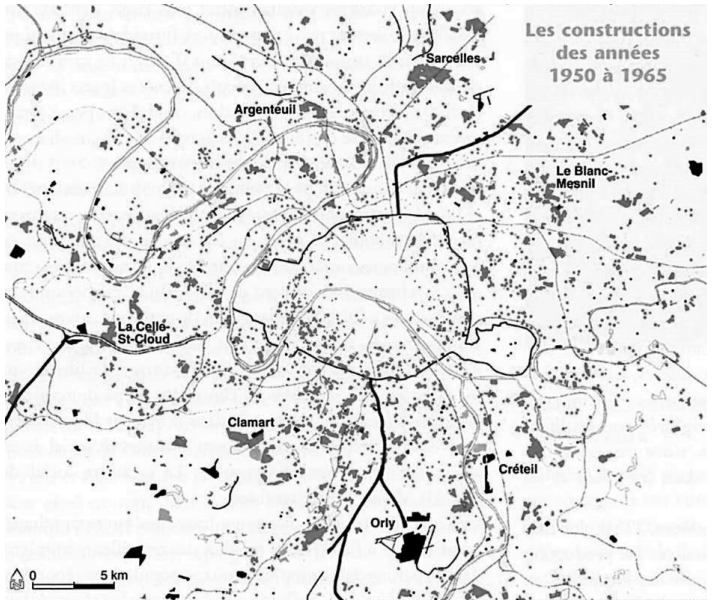


05 FORENSIC EXPLORATION
05.03 URBAN MATERIALITY

Material Practice: 20th Century

The 20th century is characterized by multiple social and political crisis which created heavy and un-natural fluctuations in the population. Wars and colonialism are two factors which have had significant impacts on urban migration patterns and therefore housing demands. To respond to multiple housing crisis, fast and efficient construction methods had to be developed. Between 1965 and 1975, the Parisian Region' s population increased by 3 million. A sudden gap that had to be addressed through vast social housing complexes, intended to house the many with little thoughts on their social and cultural impacts. The 20th Century is also synonymous to different architectural and philosophical movements. Le Corbusier and Modernism have notably influenced these large-scale mass-housing complexes. While we can critic decision making and their long-lasting impacts on the urban fabric and within society, these housing strategies were a response to the epoch' s crisis and helped, momentarily solve certain issues, while creating many cascading consequences. Concrete became the predominant material of the time for its building efficiency and relative cheapness.

Map of New Constructions 1950-1965
adapted from Jacqueline Beaujeu Garnier et Jean Bastié
Berger Levrault (1967)



05 FORENSIC EXPLORATION
05.03 URBAN MATERIALITY

Material Practice: 21st Century

The current process of urban transition is still primarily based off 20th century extractive practices aided by current financial incentives to demolish as opposed to preserve and political will to quickly achieve spatial therefore social change.

Currently, conversations around bio-sourced materials (wood) and alternative methods of construction are increasing. These alternatives would begin to shift the field of architecture away from an extractive paradigm and would begin to "reflect the territory's material richness". But while ideas are slowly being put in practice in the architectural community, status quo standards have not yet developed to the extent that they could sustain an urban change of the scale of the Grand Paris. Therefore, the city's transition for the 21st century is still backed by 20th century paradigms. Can we speak of a sustainable urban transition if the process itself of building is largely destructive? Is the 'sustainable' label only something we want to achieve as an end-result, or can the process of transforming our cities be embodied by alternative practices?

In the short-term future, sand, and gravels, found on the banks and meanders of the Seine River will continue to be the greatest extracted resource in the construction process. These millions of years old non-renewable accumulated sediments are the main components of cement and concrete.

Grand Paris Transition Material Outcomes
Hadrien Cassan (2021)

Concrete
1 000 000 kt

Excavated Dirt + Limestone
45 000 000 tons (2020-30)

66% inertes
12% sulfated
20% non-inertes, non dangerous
2% polluted

Construction Debris
500 000 000 tons (2020-30)

Rendering of Nouvel R,
Bruneseau (2019)

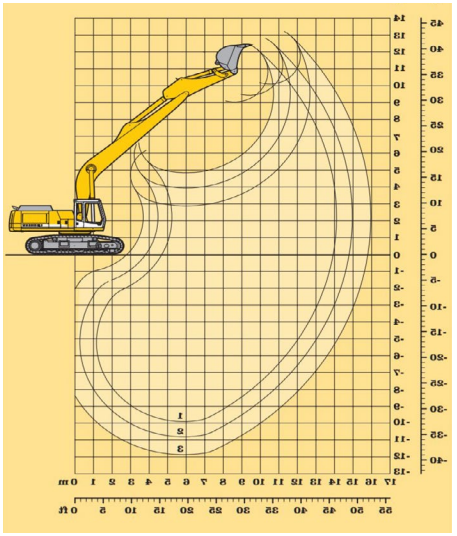
05 FORENSIC EXPLORATION
05.03 URBAN MATERIALITY

Movement

The movement of matter in the process of deterritorialization where movement is applied through artificial forces, most often counter acting natural flows. In the case of Paris, barges along the Seine counter the river' s currents to reach the centrally placed concentration of inhabitants. By reterritorializing and later reterritorializing matter, the composite is applied new cultural perspectives and transformations into materials. When walking in the streets of the city, people do not realize they are walking in and around past valleys formed by sediments dating back millions of years extracted 100 of kilometers away.

Machinery

This development of the Barge typology has had significant consequences on the morphology of riverbed. Many parts of the Seine River and its tributaries have been widened to allow through traffic by these ever growing barges. Efficiency and volumetric growth of both movement of goods and materials have provocked landscape modifications. These machines, powered by fossil fuelds, allow small species such as humans to manipulate entire territories.



Bateau et petit convoi, type Canal du Nord,
capacité 750 t, longueur 60 m + 30 m

Chaland de Seine ou du Rhône,
capacité 900 t, longueur 50 à 60 m

Actors and Financing

It is no surprise that the largest construction groups in France have all been fervant backers of the Grand Paris Express project and its associated building process. Vince, Bouygues, Eiffage are three of the largest european construction groups and they have all led the way for this large urban project.

In total, the Grand Paris Express is a multi-billion dollar project with investements from public and private actors.

The 2024 Olympic Games themselves are looking to cost more than 1.5 Billion euroes with financing coming in large part by the State, the Region, and the City. This project, becomes particularly driven by similar agendas in both governing and industrial actors.

Top 10 European Construction Groups

1. Vinci : 40,33 Billion €, +4 %
2. ACS : 38,37 Billion €, =
3. Bouygues : 33,34 Billion €, -1%
4. Hochtief : 25,69 Billion €, +1%
5. Skanska : 15,77 Billion €, +6%
6. Eiffage : 14,26 Billion €, +2%
7. Colas : 13,05 Billion €, =
8. Strabag : 12,47 Billion €, -4%
9. Balfour Beatty : 11,91 Billion €, -11%
10. Bilfinger : 8,41 Billion €, -1%

source: Bati Actu (2018)

Eiffage wins contracts worth almost €97 million to develop the Grand Paris Express stations La Courneuve Six-Routes and Le Blanc-Mesnil

22.02.2021

Bouygues wins €181 million Grand Paris project

By Mike Hayes | 19 May 2020

NEWS

VINCI Construction-led JV wins €799m Grand Paris Express contract

18 May 2020 (Last Updated May 18th, 2020 11:19)

VINCI Construction has been awarded the contract to build the viaduct for metro line 18 of the Grand Paris Express

15 DECEMBER 2020 - 5:45 PM - NEW CONTRACTS - FRANCE

· A 6.7 km viaduct between Massy-Palaiseau and the future overhead CEA Saint-Aubin station · 30 months of work
· A €193 million contract

05 FORENSIC EXPLORATION
05.04 LOCALIZING TYPOLOGIES

From Materiality to Spatial Externalities

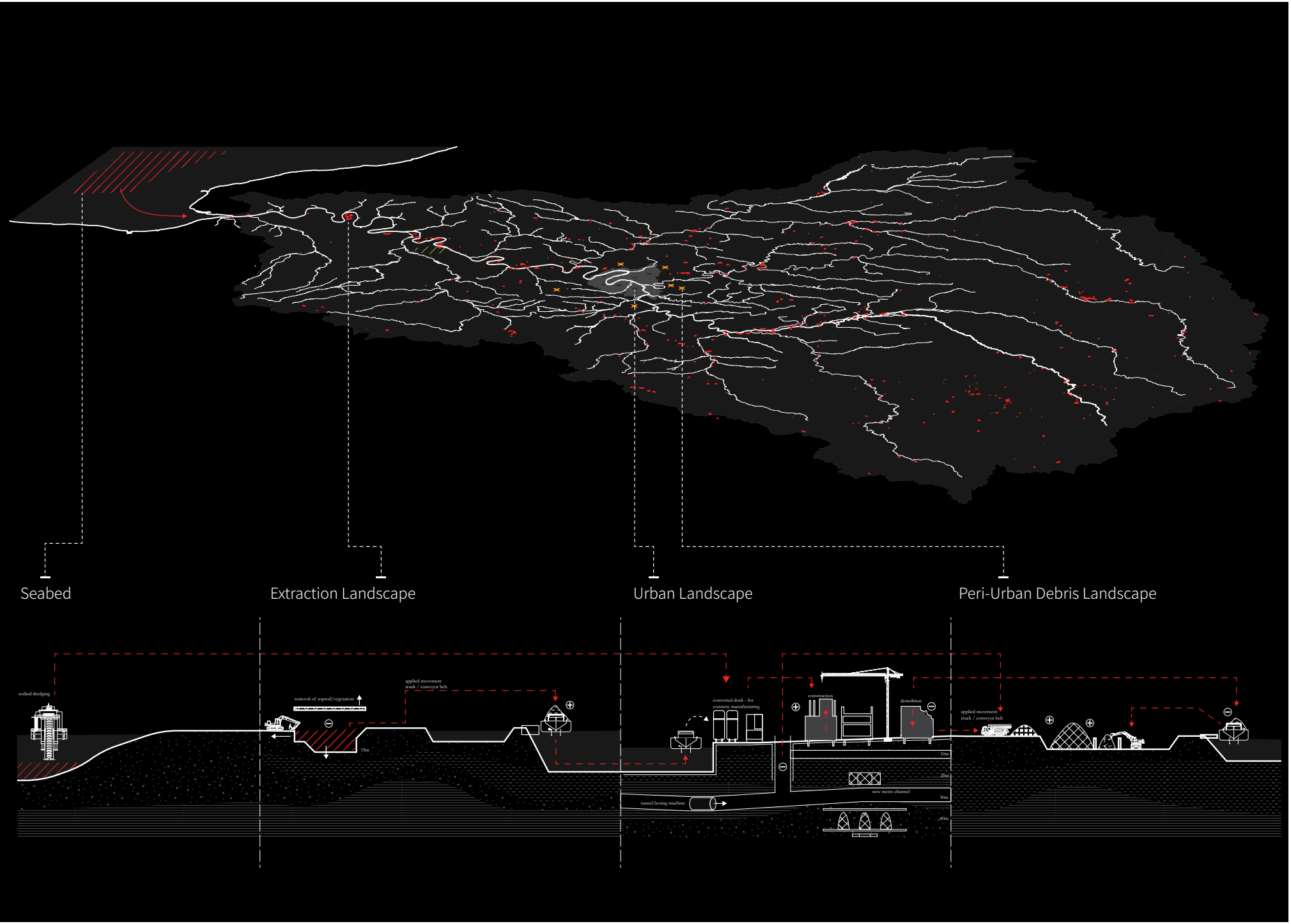
By tacking material movement, we can create a holistic perspective of the material apparatus and spatial externalities which derive from this urban transition. Three typologies of spatial landscapes have here been defined as 'landscape of construction' which are identified here are:

(1) the extraction sites: riverine adjacent open pit quarries

(2) the construction sites: urban manifestation of construction

(3) the storage and transfer sites: sites for waste and deposits

The transect allows to expose the relational system which links geographies, industrial operations, and spatial concequences.

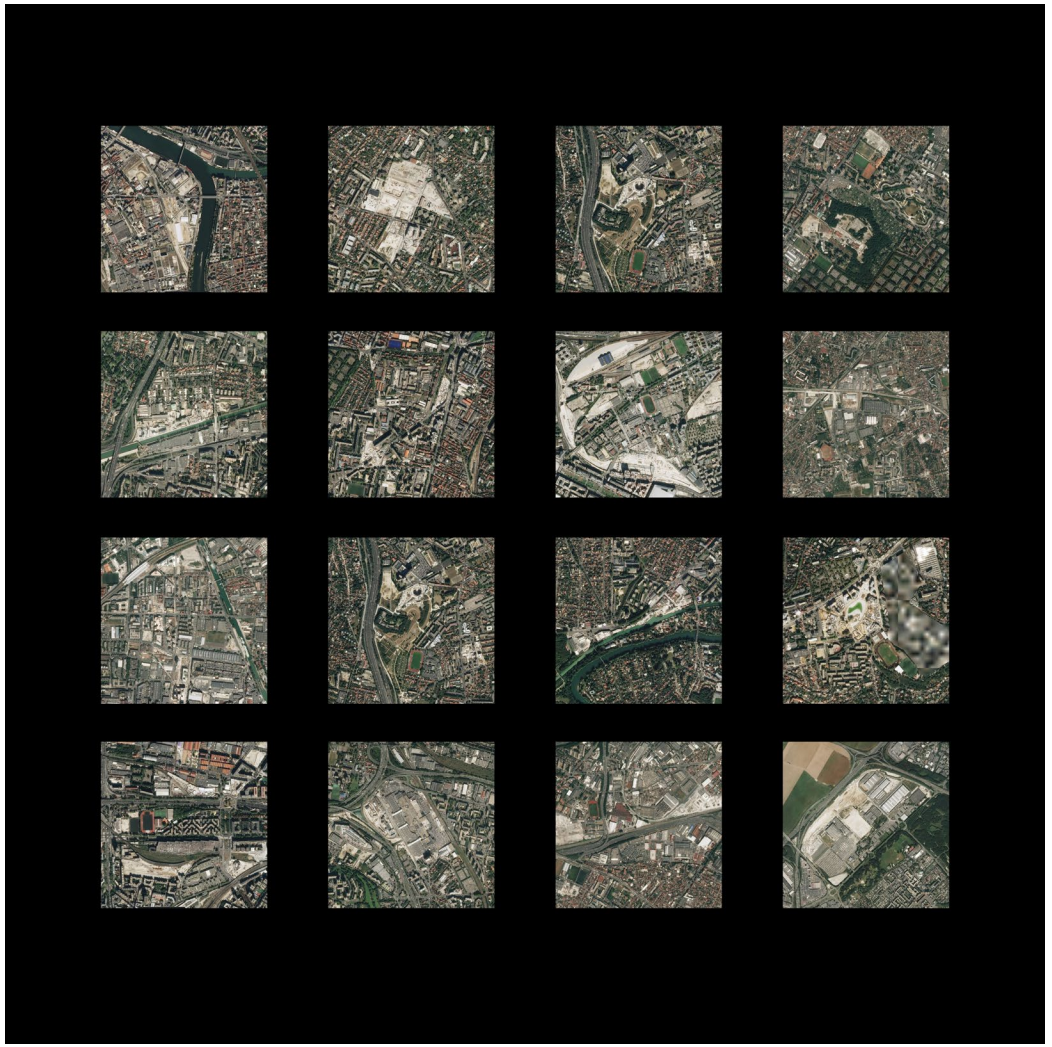

Seabed
Extraction Landscape
Urban Landscape
Peri-Urban Debris Landscape
seabed dredging
removal of topsoil/vegetation
applied movement
track / conveyor belt
15m
converted dock - for
concrete manufacturing
construction
demolition
applied movement
track / conveyor belt
10m
20m
new metro channel
30m
tunnel boring machine
40m

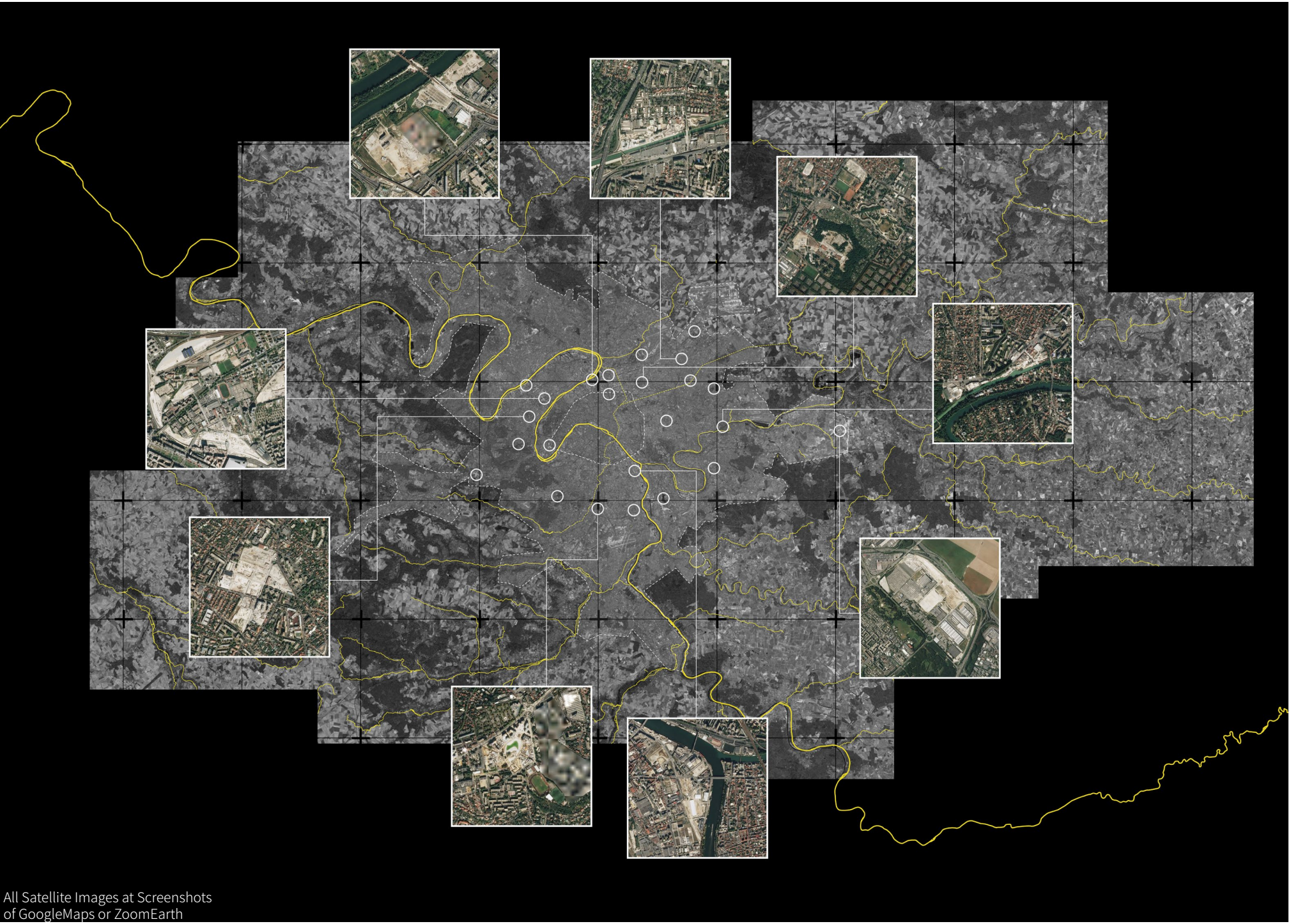
05 FORENSIC EXPLORATION
05.04 LOCALIZING TYPOLOGIES

Urban Context

The urban construction sites are fuel by material that far surpass the consutrction boundaries. While they seem like isolated island in the mist of already existing urban fabric, these construction sites are physically linked by the new Grand Pris Express metro network and procedurally linked by the operational chain of the construction industry. These sites while intriinsicly urban are made up of riverine matte(sediments) that have been significantly altered to be requalified as urban matter (urban material, concrete).

Site of Construction in the Grand Paris
BTP (2019)





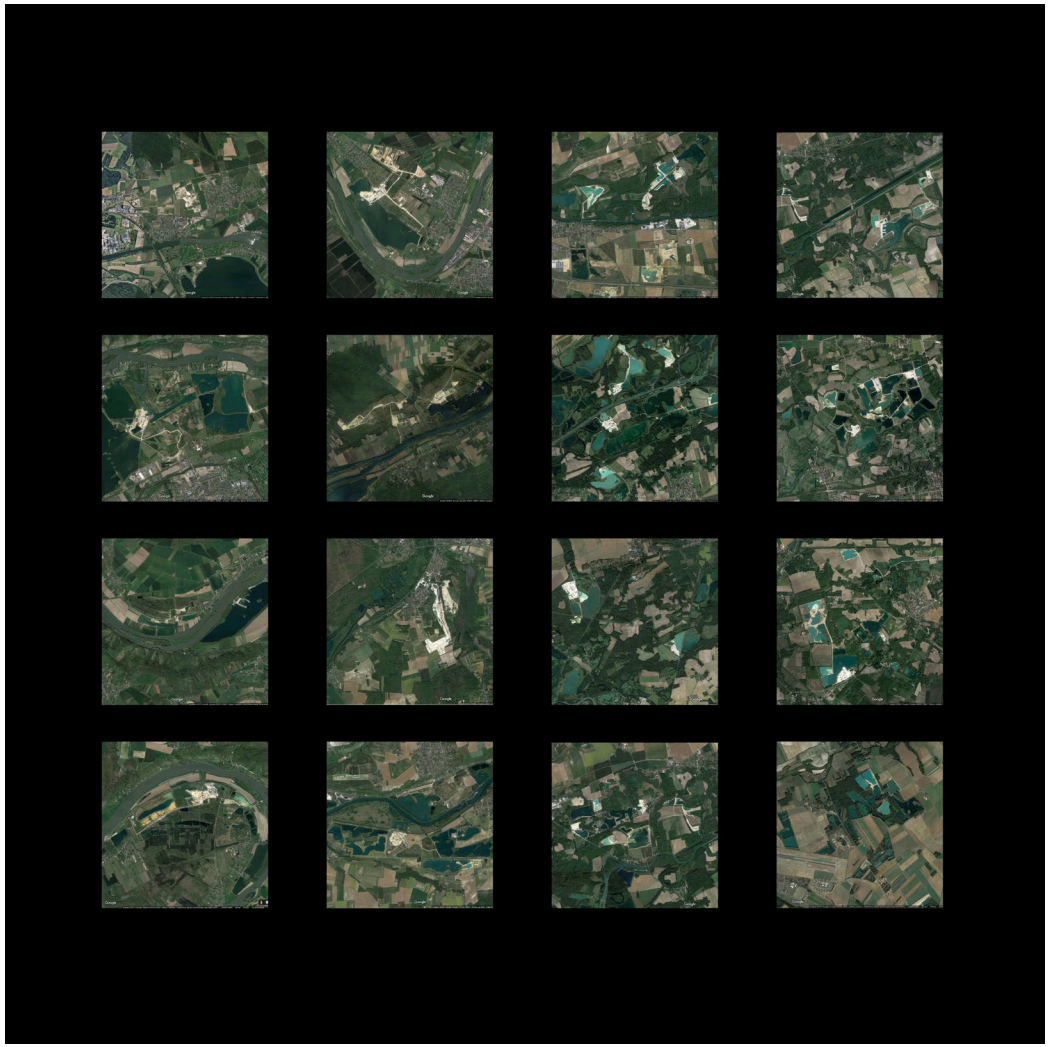
All Satellite Images at Screenshots
of GoogleMaps or ZoomEarth

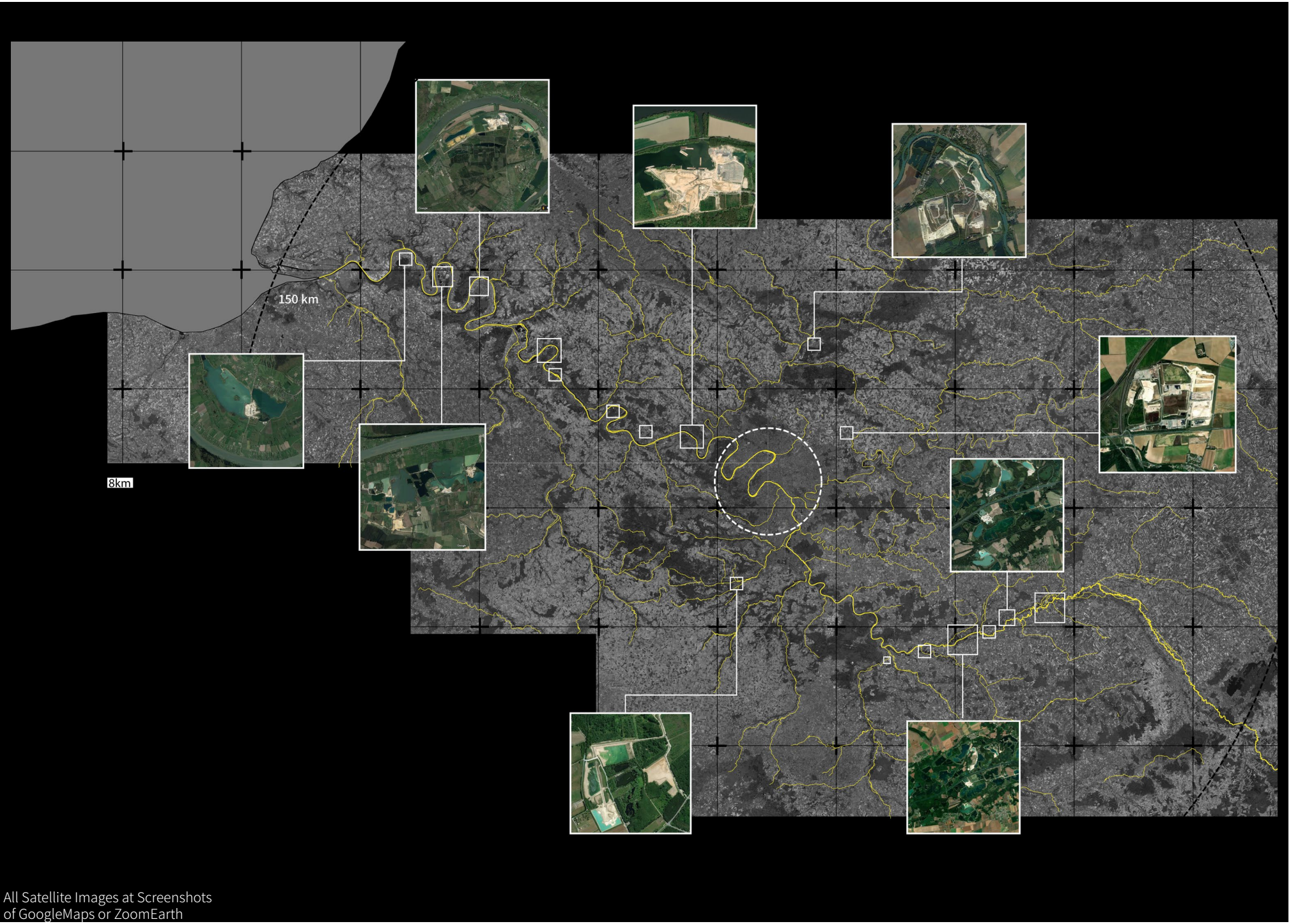
05 FORENSIC EXPLORATION
05.04 LOCALIZING TYPOLOGIES

Riverine Territory

The riverine territory is functionally and physically transformed to respond to the demand of new material for the production of concrete. Open-pit quarry sites are planned according to regional mandates, and operated by construction industry industry specialist. Whereas there are guidelance towards post-extraction restoration, these are often performed on a surface level and do not constitute basis for reflection.

Figure 11 : Vue aérienne de la zone de traitement



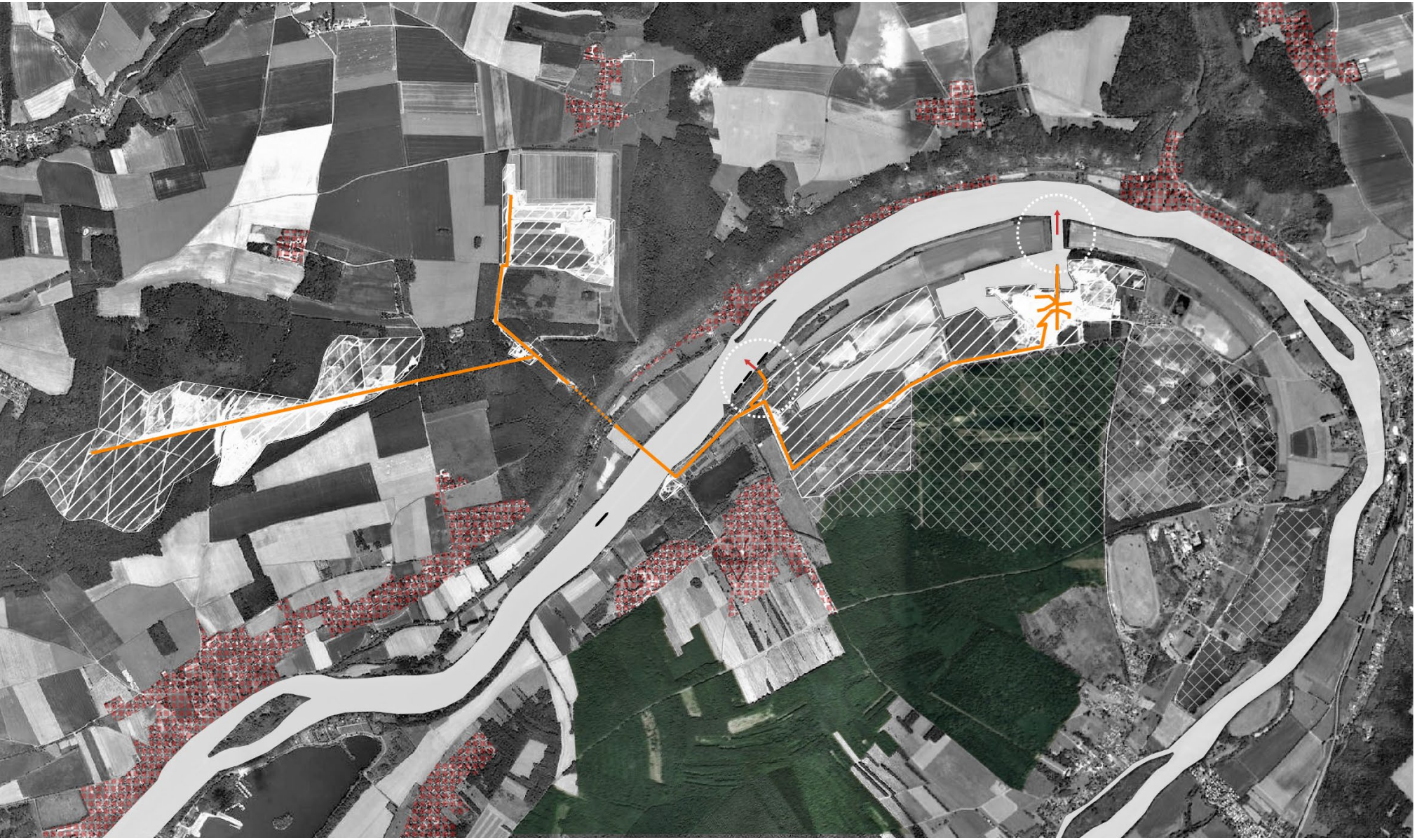


All Satellite Images at Screenshots
of GoogleMaps or ZoomEarth

05 FORENSIC EXPLORATION
05.05 LANDSCAPES OF EXTRACTION

Downstream Meander

The downstream river naturally has the largest width along the river stretch. The river' s meanders are far more pronounce and all result from deposits of sediments. The Downstream Typology is majority borders by underutilized¬ agricultural fields – producing cereals and other maize for export, primarily to North Africa (through the Havre harbor) . Small settlements are disperse throughout the riverine environment . The extractions sites around these lands utilize the uninvested space and low social constraints – consuming more lands and sprawling out further away from another. Vast networks of converyor belts allow for the extraction industry to move matter from site to site.



Downstream Meander Analysis
Hadrien Cassan (2021)

05 FORENSIC EXPLORATION
05.05 LANDSCAPES OF EXTRACTION

Peri-Urban Meander

The river edges at the peripheral level (surrounding the city of Paris) are in the visible field of communities and populations. These zones are more inhabited while also disinvesting large swatches of lands. These meanders often illustrate the border between the urban and the agricultural – creating drooscapes and waste spaces. Landscape that are not design or included in the sociability of communities are poised by human activities. Here you can find landfills of all sorts, small informal and temporary settlements (camping…). The extractions sites are more condensed as to be more efficient with the land they can extract from.

Environmentally, the area might have lost much of its original grandeur and particularities. Interventions by Architecture Firm TER strived to highlight the areas ecologies through minimal interventionism on one of the sites adjacent to the river. Poisy, here represented, is the city of the Villa Savoy.

Peri-Urban Meander Analysis
Hadrien Cassan (2021)

05 FORENSIC EXPLORATION
05.05 LANDSCAPES OF EXTRACTION

Upstream Alluvial Plain

The grand Basse is a site of great sensibility. This natural wetland, protected under the Natura 2000 network, is one of the only significant wet zones in the Seine' s system. Yet extraction interventions here multiply and are enormous. This is profoundly affecting the ecological systems' root and the establishment of various species and processes. Invasive species and water pollution are some of the invited externalities due to the extraction process and landscape transformations.

The turnover of land here is of particular concern. The demand from the urban for materials is affecting quite intensely this vital zone that has historically been immensely altered. The riverine communities here aren' t in the visual vicinity due to the low topography but are in close proximity to the sites of extraction.

Upstream Meander Analysis
Hadrien Cassan (2021)

05 FORENSIC EXPLORATION
05 CONCLUSION

Conclusion

Beyond the anthropogenic urban systems (social political and cultural), there are physical, ecological, and material requirements, impacts, and externalities of this urban transition. Here it becomes primordial to step away from a spatial vaccum and regard the Earthly systems which fuel the urban as the foundation for change.

There is an embeded history of intense urban transition in the Parisian Region as a means to resolve socio-political conflicts. These transition allow for the demolition of 'problematic' zones and the creation of new networks and economic production. Urban development surpasses simply the politial and social organization to disturbe the territorial ecologies from which it depends on.

Materials are used, in abundance, to signify a shift in societal organization of the urban. Haussman' s use of cream-colored stone, locally-sourced Lutetian limestone, is emblematic of 19th Century Paris, yet the undergrorund limestone quarries from which the material was sourced are still problematic in the Parisian Region and have taken more than a century to be filled up. Today concrete is the material leaving a considerable mark on the landscape. Surface quarries, from which sands and aggregates are sources extensively, are devastating landscapes and terrioties and enabling a ecological functioning of the riverine envrioment. Flood zones and riparian corridors (zones of high concentration of these mineral depositis) are being robed of their geologies and embankements and the anthropogenic river does not allow for floods and futur depositis of minerals. Sediments are finite because their ability for replenishment has been surpressed.

While a critic of the drivers of urban development is made - a status-quo based on exploitative practices toward socio-cultural repression powered by false ideals of perpetual economic productivity, little can be done to stop the machine that has now been fully financially funded and politically accepted.

Towards a Healing Material Practice

This graduation project looks not to deviated urban construction projects but to counter-act the physical environmental externalities of the urban transition by proposing co-constructive pathways between the urban and the riverine. Zones that have been severely affected by the practice of building an architecture require considerable attention that surpassed generic rehabilitation towards a fertile repair.

Ruins are synonymous to hardship, struggle. But can also be painted with hope, and opportunity. Lived and learned experience (Horvileur, 2021). What is this material? Where is it located? And what kind of landscape can we create given its past and our future...?

A Productive Nature does not mean productive for the society – directly (it is not a physically tangible effect such as material) but rather a climate regulator, a flood defense to the city, a CO2 well, a biodiversity hub… How does the repair and functioning of an environment become socially acceptable as a productive.

Still from Powaqqatsi
Godfrey Reggio (1988)
modified by author (2021)

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06 REPARATIVE VISION

06 REPARATIVE VISION
06.01 REPAIR AS MATERIAL PRACTICE

Damaged Nature

The terms damaged ecologies or broken nature refer to spaces, relationships, communities, and ecosystems that have experienced significant destruction, damage, oppression, or suppression in the name of unilateral progress and development. Damaged nature is the characterized by:

(1) altered landscapes: provoked by capital-seeking status quo practices significantly damaging ecological systems.

(2) unilateral relationship: current uneven 'give and take' relationship between Paris < - > Territory. Surpass the one-way exchange between serving territory and feeding territory.

(3) suppression of possibilities: the active state of impossibility for various communities and ecosystem to flourish.

The status of damaged: an ontologically modified object that suppresses possibilities of growth (development) benefiting the few and impacting the many. A uniliteral relationship that benefits the few while impacting the many. When applied to space: an uneven exchange between urban and territorial, where landscapes are singlehandedly altered to produce and not grow.

Human interventions did not break nature, spaces are always in motion, landscapes are dynamic and change from one state to another. Here what is characterized as damaged is the depletion of systemic functioning as a result of a destructive practice driven solemnly by political and financial forces with little consideration to the geo and eco systems. By identifying specific landscapes as damaged as opposed to functioning emphasizes a change of approach towards the territory. It signifies a shift from the commodification of the Earth to continue establishing the unique anthropogenic territory (an extractivist and capitalist paradigm) to an understanding of relational entanglements (between species and processes) which provides unequivocal multilateral prosperity.

Care and Reparative Design

Daniela Zyman, curator, artistic director, and researcher, openly called out, in the Transitional Territories Symposium (2021), for the utilization of different forms of knowledge towards an application of care with a goal to heal deteriorated ecological networks, patches, and relations. Hence forth, the notion of repair is informed by a local understanding of circumstances and aims toward a sensitive inhabitation of riverine environments that includes a thorough integration of more-than-human agents. This sensitivity considers that humans are not the only agents of change shaping the landscape - counteracting the last century's territorial paradigm. That realization invites anthropogenic agents of change to work with other forces and entities that shape our shared and common environment. Looking at notions of Other-than-human or more-than-human avoids a human exceptionalism perspective and provides "a shift from a singular concern with culture and sociality as a strictly human attribute to include multi-species and geo-processes voices" (Lien and Palsson, 2019, p.4).

This attitude towards design demands that landscape modifications in the name of prosperity offer the possibility or structure for more-than-human forces to be equal agents in environmental development. Gustavo Blanco-Wells (2021) coins the term 'socio-geo-ecologies" to emphasize that "specific geological characteristics make possible entanglement of interdependent relationships between human and non-human agents."

This modus operandi implies open-ended spatial and procedural actions, practices and modes of amendment placing significantly care to spaces, relationships, communities, and ecosystems that are deemed broken (having experience particular destruction, damage, oppression, or suppression). Reparative Design does not look to erase the violations and histories of places but provide equal opportunities to generate a healing process in fragile zones creating "life-given potentialities" toward viability and fertility (Perez Fjalland, Samson, 2018).

[...] a reorganization of practices of resistance, remediation, and mutual care, oriented to generate reparative and/or transformative processes from damaged ecologies and communities. Crises constitute true ontological experimentation processes where the presence of other-than-human natures, and of artifacts or devices that participate in reparative actions, become visible. Reparative design becomes an heuristic device to explore the association modes of different entities, which, when confronted with the effects of human-induced destructive events, seek to repair the damage and transform the conditions of coexistence of various life forms. The relevant attributes of these socio-geo-ecologies, beyond the individual, community, or institutional aspects, are the specific geological characteristics that make possible an entanglement of interdependent relationships between human and non-human agents.

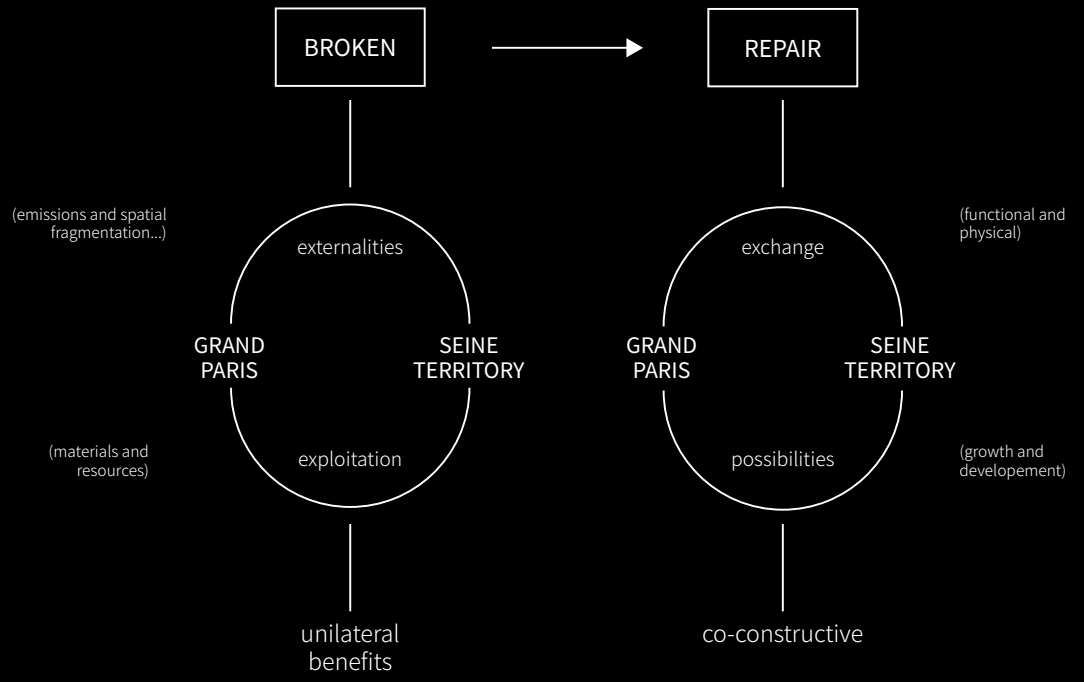
Gustavo Blanco-Wells (2021)

Broken nature (symptomes)

(1) altered landscapes: provoked by capital-seeking status quo practices significantly damaging ecological systems.
(2) unilateral relationship: current uneven 'give and take' relationship between Paris < - > Territory. Surpass the one-way exchange between serving territory and feeding territory.
(3) suppression of possibilities: the active state of impossibility for various communities and ecosystem to flourish.

Reparative Practice (remedies)

(1) Recognition of agency: The urban (the human) giving legal agency to the River and its environment. Recognizing it as an alive and dynamic entity.
(2) Creation of a co-beneficial relationship: Ecological rehabilitation as productive: not only physically but systemically (from source of matter to source of process)
(3) Healing of damaged ecosystems and geologies: Incorporation of care towards human, non-human, and more than human processes



Repair Diagram
Hadrien Cassan (2021)

06 REPARATIVE VISION
06.02 REGIONAL OPPORTUNITIES

In order to choose and apply a reparative vision and design in the Seine Watershed, this project zoomed into the Regional Scale of the Ile-de-France and analyzed the potential for most impactful site of intervention. Following the Forensic Analysis and as you will see in the next page, three sites, representing three different typologies in the watershed were chosen as to schematically represent the potential for change. In the end, the reparative design strategy was only applied on one site, La Bassée for its strategic upstream position and because it was the area deemed most damaged by the extraction process.

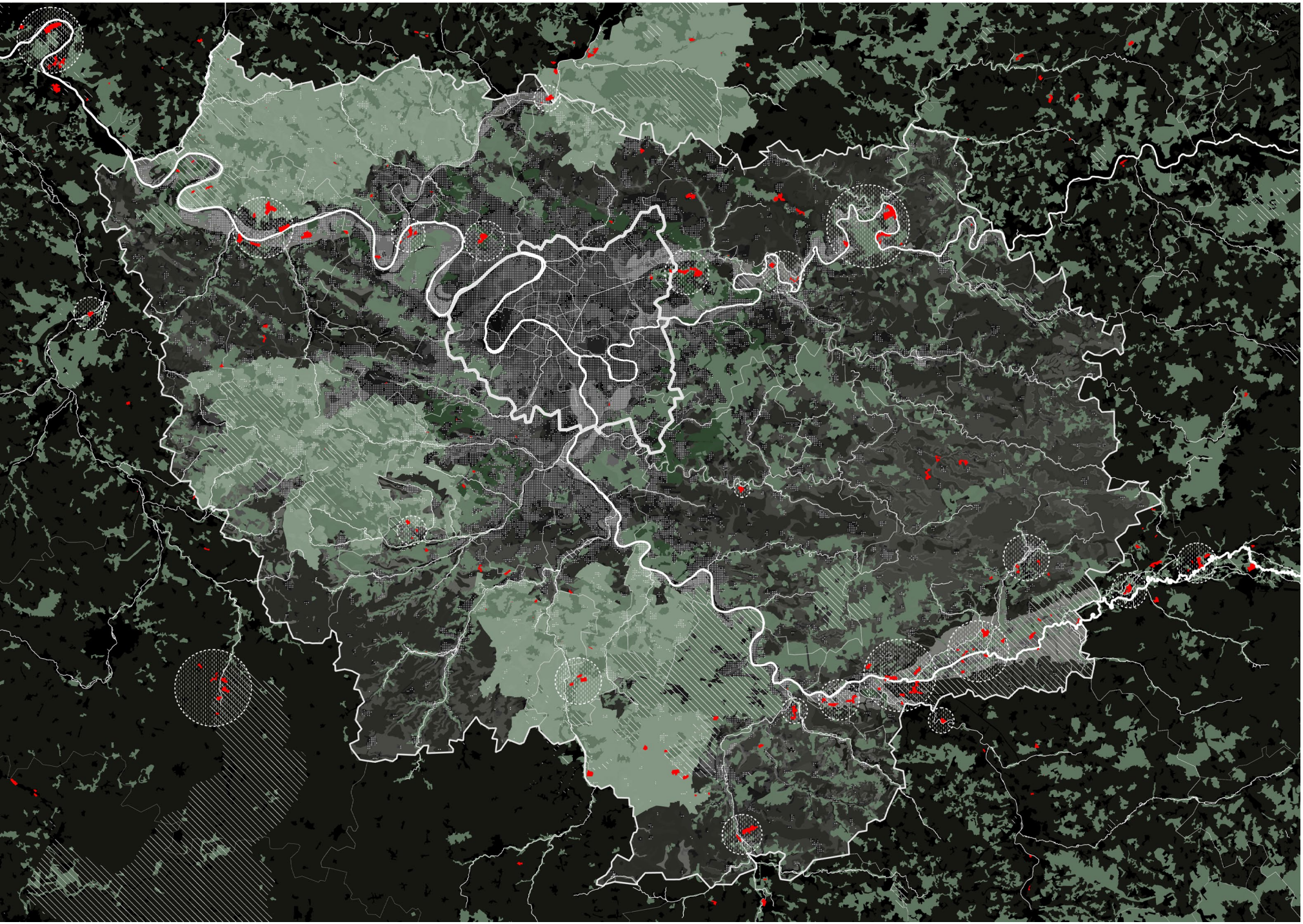
In response to the three sites analyzed in the Forensic Exploration, conceptual and diagrammatic visions were drafted in response to the specific challenges and opportunities each site offered. While only one of these sites has been further looked at, it was import as a process of generating spatial ideas and as a way to start zooming into a micro scale to perform these multiple abstract visions.

Infrastructure
- Sites of interest
- Extraction Sites

Territorial Subdivision
- Region
- Departement
- Arrondissement
- Commune

Territorial Occupation
- Urbanized zone
- Agriculture fields (mixte)
- Forested area (mixte)

Protection
- Nature 2000
- Regional natural parks
- Sensitive ecological zone

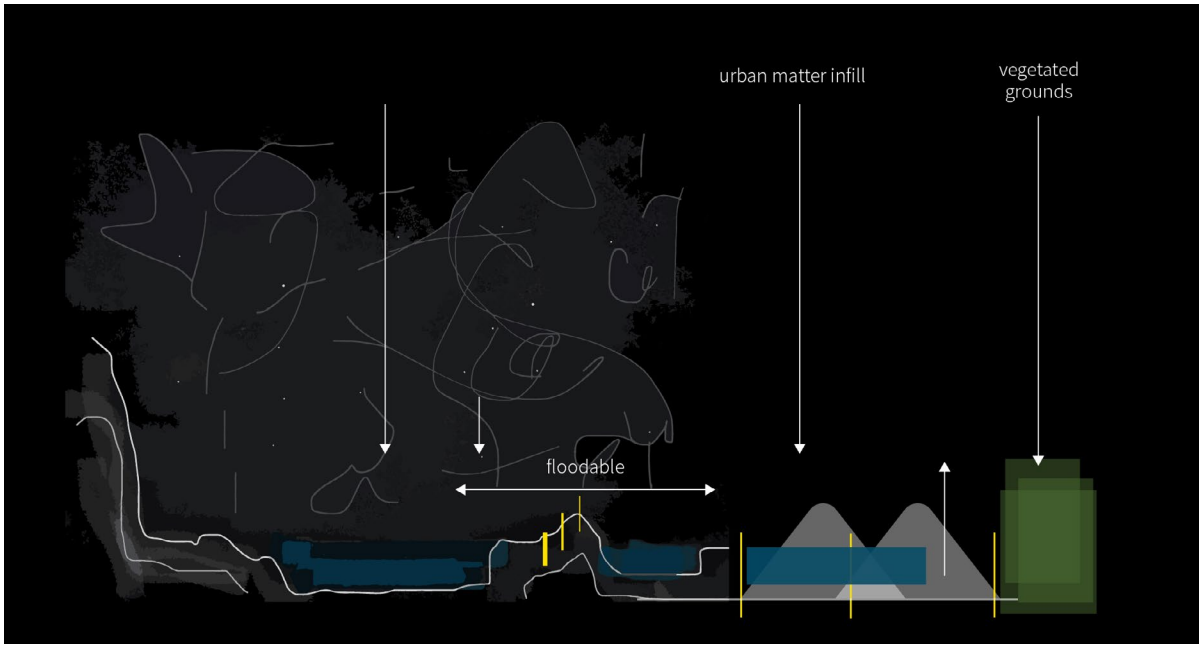


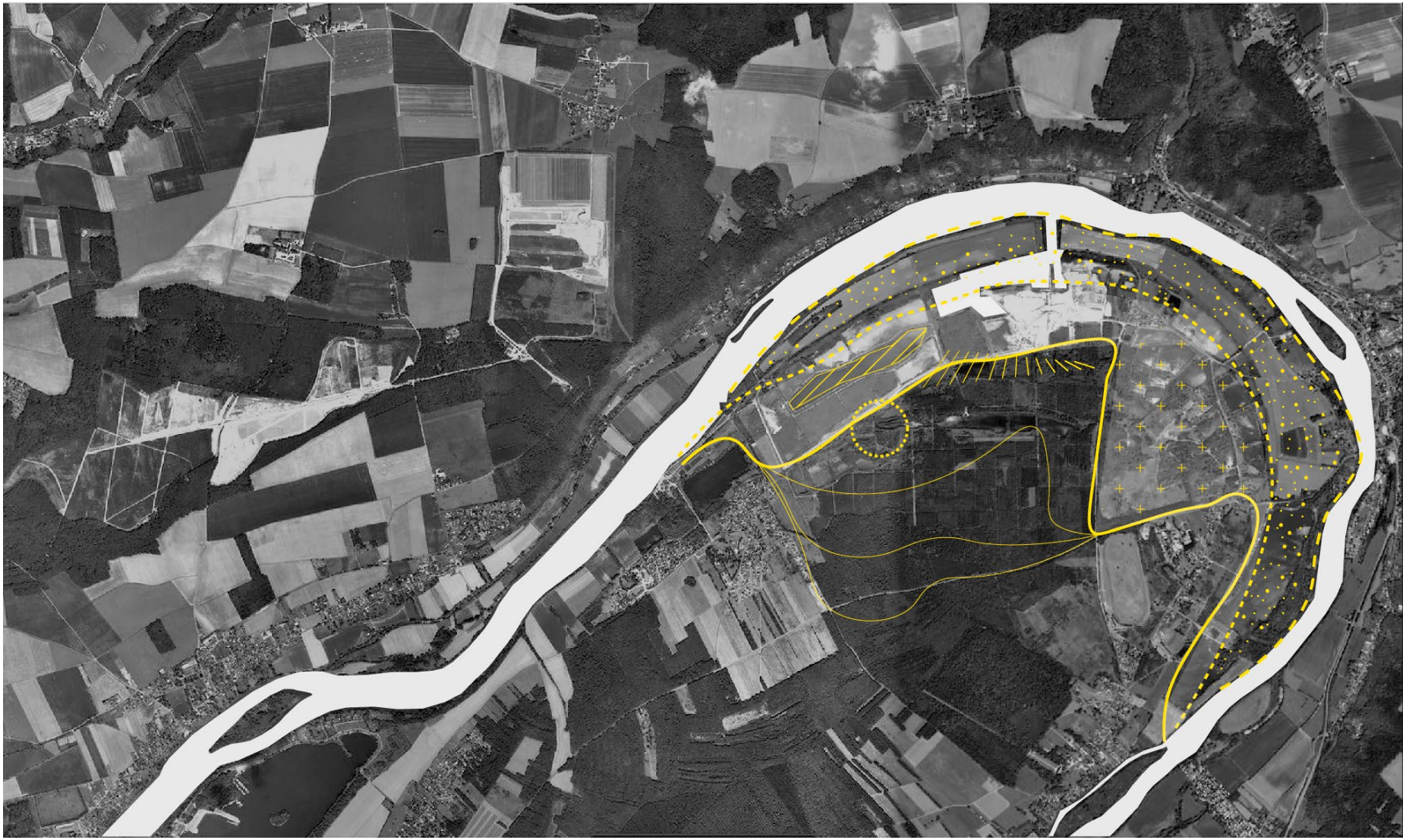
06 REPARATIVE VISION
06.03 LOCAL VISIONS

Downstream Meander

The Downstream Meander offered more space to reconnect the extracted landscape with the natural features that were found. The debit of water being more important downstream, an invitation for the river to use to flood plain in times of heavy rain fall or peak discharge allowed for a sedimentation process to occur, as a way to replenish the meander and off load pressure from local communities.

Conceptual Section of Downstream Meander
Hadrien Cassan (2021)





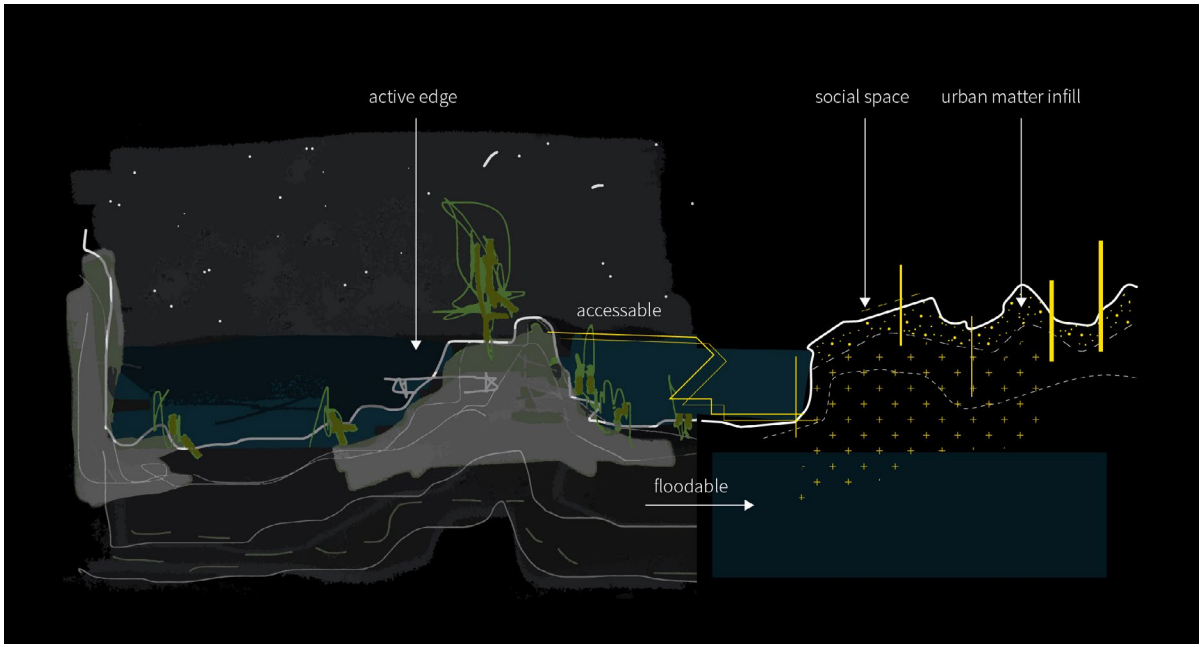
Conceptual Map of Downstream Meander
Hadrien Cassan (2021)

06 REPARATIVE VISION
06.03 LOCAL VISIONS

Peri-Urban Meander

The extraction sites found in a Peri Urban Meander needed to be better integrated into the social fabric of the zone. In fact, on this site, the semi agricultural and drosscapes segregates different communities who do not take advantage of the open space. A Meander Park, inviting people to interact with the extraction and post extraction process, a rehabilitation of park land, social programming are all possibilities to revitalize and integrate this site into the fabric.

Conceptual Section of Peri-Urban Meander
Hadrien Cassan (2021)



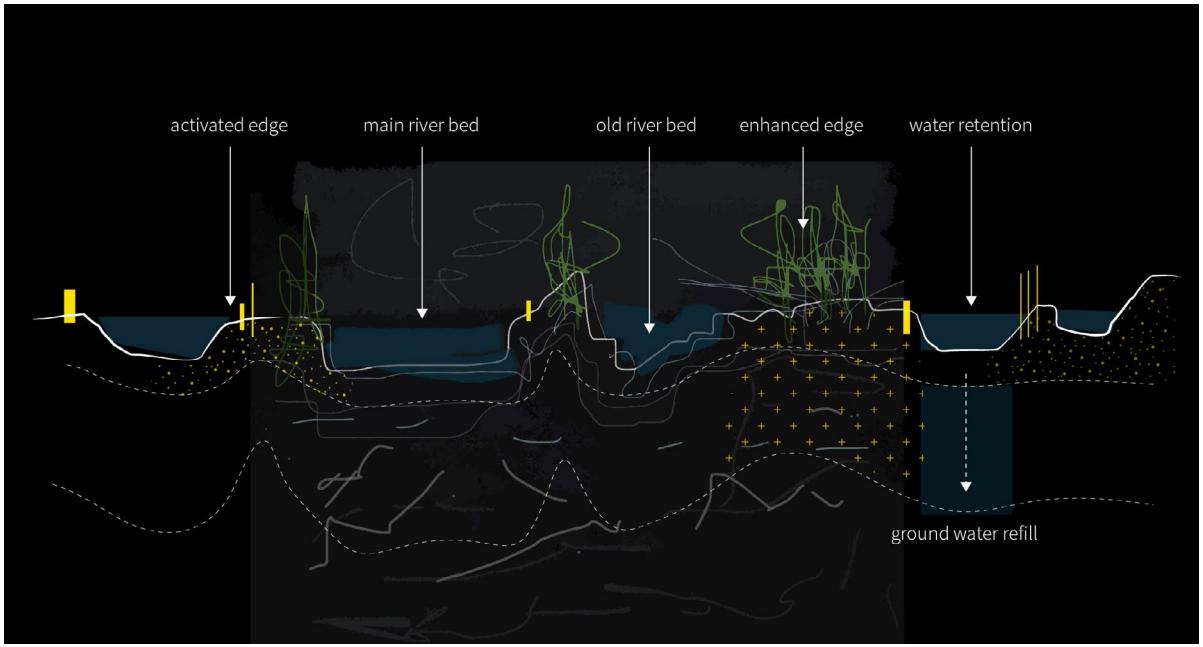
Conceptual Map of Peri-Urban Meander
Hadrien Cassan (2021)

06 REPARATIVE VISION
06.03 LOCAL VISIONS

Upstream Alluvial Plain

The Upstream alluvial plain posed the most challenges and will be particularly dived into in the design portion. This site was chosen for its upstream characteristics which offers a unique opportunity to control water level in the Parisian Area. This site, being of geological importance for its large reserve of alluvial sediment has been particularly affected by the extraction process. In that sense, it was chosen as the site to propose a reparative vision.

Conceptual Section of Upstream Meander
Hadrien Cassan (2021)



Conceptual Map of Upstream Meander
Hadrien Cassan (2021)

06 REPARATIVE VISION
06.04 INTRODUCTION TO LA BASSÉE

Site History

La Bassée is a source of Aggregate Extraction since the 1960s corelated with the rise of migration to the Parisian Region due to varying waves of liberation in former colonies in North Africa. In that sense, the sediment extracted here to produce concrete holds strong political and ethical weight, not in their essence, but in the products, it has been transformed into as they were used for the development of Social Housing (HLM) which have contributed to spatial segregation in the Parisian Region.

The Seine River which used to dynamically meander through the alluvial plain has now been significantly channelized. Due to the increase in boat traffic associated with Aggregate Extraction. The channelization and widening of the River Channel have had many repercussions notably suppressing the fertile link between land and water, when it comes to nutrient exchange and ground water replenishment.

Regional Importance

This site is of regional importance due to its inherent ecological, hydrological, and geological characteristics. It is the last remaining alluvial wetland in the entire watershed and the greatest source of alluvial aggregate in the region. La Bassée is also the site of the Nogent-sur-Seine Nuclear Powerplant, which, with 2 nuclear reactors, produce more than a third of the Parisian Region' s electricity.

Additionally, being located upstream of the Parisian region, La Bassée is a strategic landscape for water management and flood control. As the City of Paris is continually affected by yearly-flooding due to heavy discharge at peek wet season, a 5th water retention structure is expected within the La Bassée boundaries.

Largest Regional Aggregate Reserve :
Granulat Extraction since 1960 (post-war, post-colonial era)

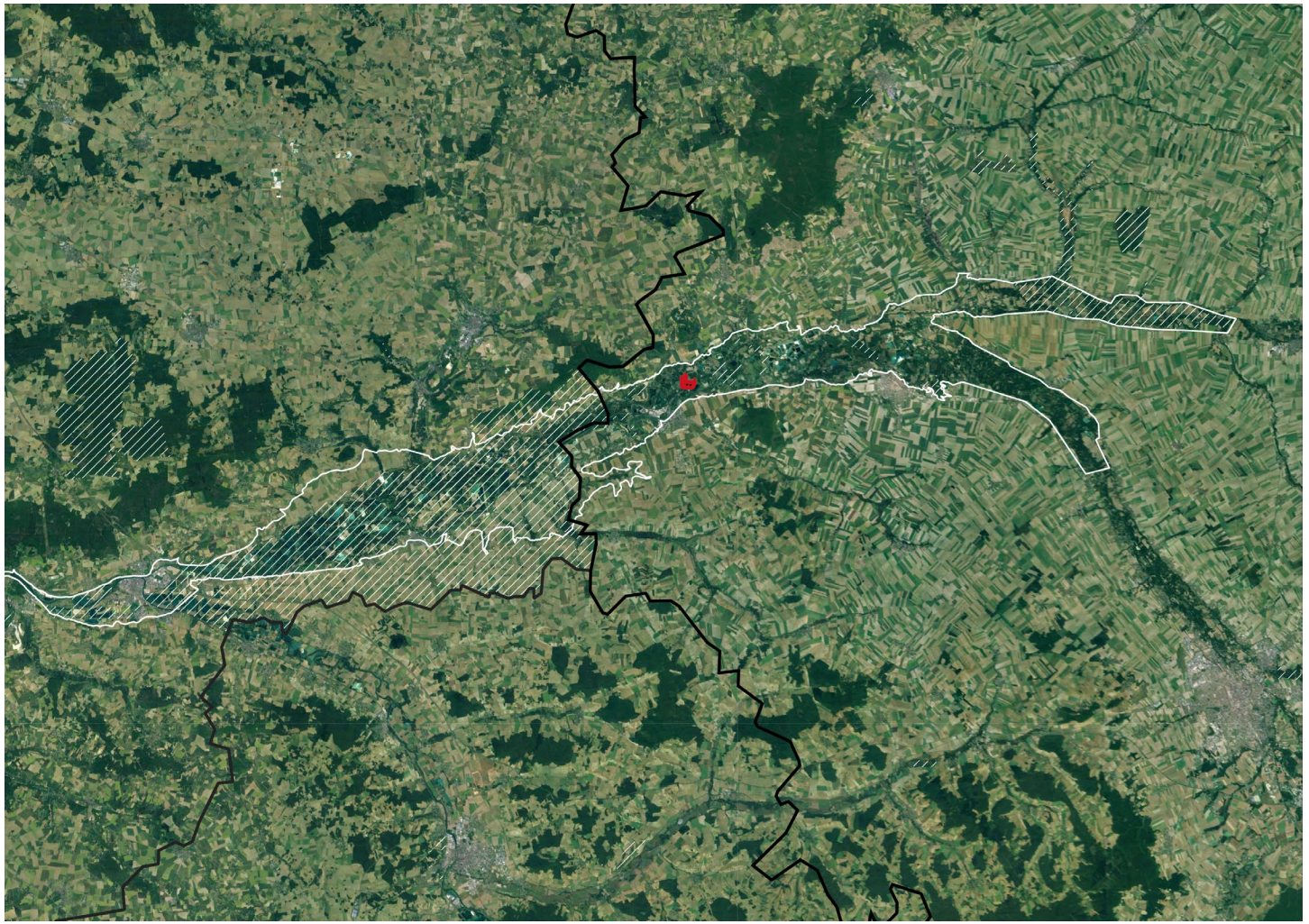
Site of Interest for 5th water retention basin
in the Seine River Watershed

Site of Nogent-sur-Seine Nuclear Powerplant:
Provides 40% of electricity for the Parisian Region


Aggregate Quarries


Ecological Reserve


Nuclear Powerplant



06 REPARATIVE VISION
06.04 INTRODUCTION TO LA BASSÉE

Geological Characteristics

La Bassée, much like the rest of the Seine sits on a layer of chalk dating back more than 65 million years ago. But the Site is particularly characterized by its vast formation of alluvial sediment derived from the relatively flat landform and the past meanders and fluvial distributaries. Two types of sediments characterize La Bassée:

- Ancient Alluvium primarily composed of sand and alluvial gravel.

- Recent Alluvium primarily composed of limestones (a mixture of sand and gravel)

These alluviums are most often covered by a clay loam substrate which can contain peat admixtures (Biotope, 2012).

Environmental Characteristics

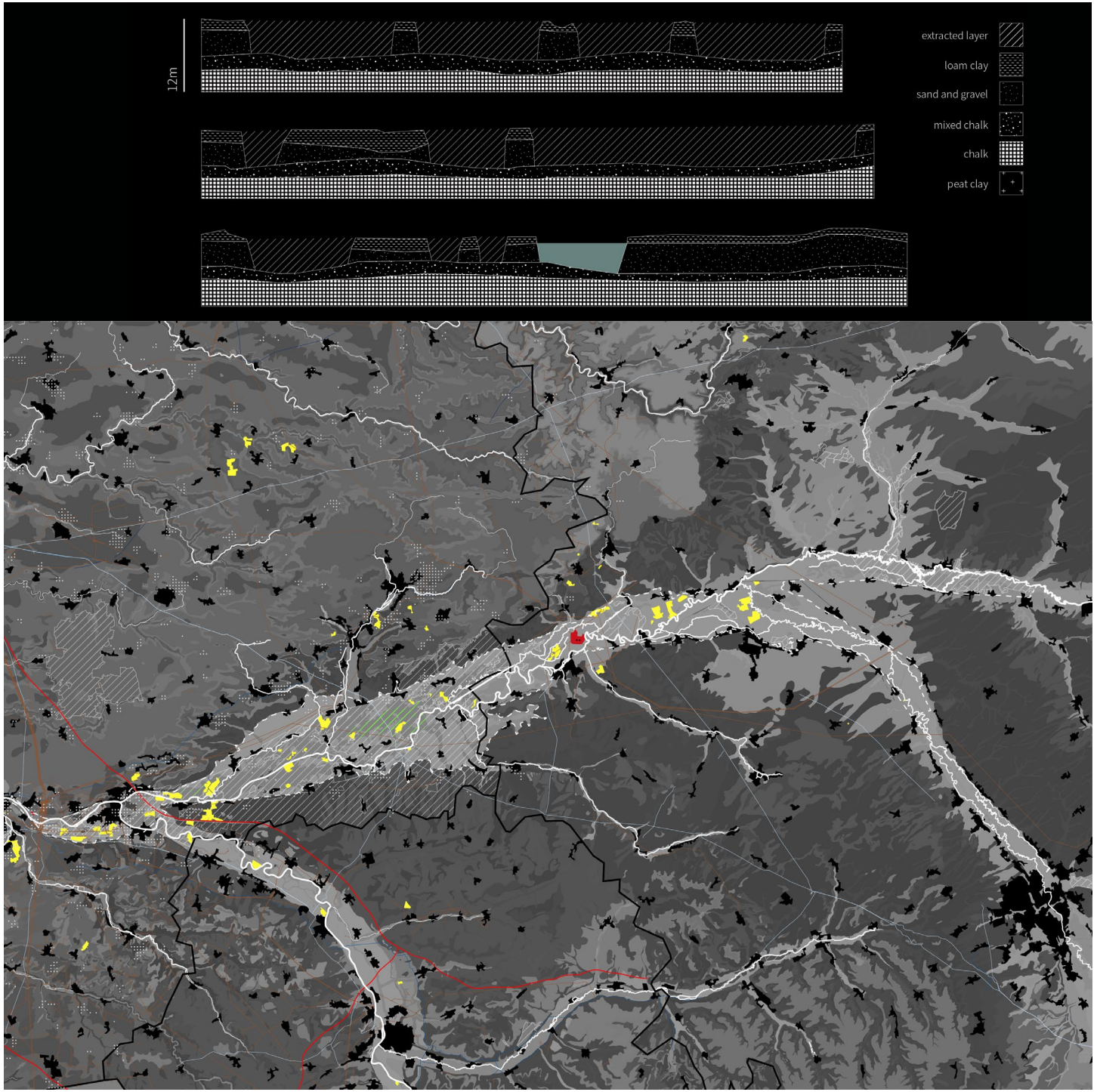
Ecologically, La Bassée has been classified as a Nature 2000 Site since 2002 for its unique habitat condition in a region characterized primarily by farmlands. As an alluvial forest, the site offers diverse ecosystem types from hardwood forested areas to megaphorbs, vast areas of tall, exuberant, and perennial herbs. This diversity of ecological landscapes invites various bird species from more common song birds such as the *Oedicnème Criard* (Annex 2 of Natura 2000 registry) to regionally or nationally endangered species.

Various fish species can also be found spawning on the river edges. But while the landscapes is characterized by vast bodies of waters (inundated eshausted quarries), the ponds do not interact with one another or the river bed, prohibiting fish species to propagate freely, and containing the possibilities for aquatic ecosystems to develop into complex biodiversity networks.

Last Alluvial Forest (Wetland) in the Seine Basin

Nature 2000 Sites « Habitats-Faune-Flore »

Ecological Reserve of National Importance


12m
extracted layer
loam clay
sand and gravel
mixed chalk
chalk
peat clay

06 REPARATIVE VISION
06.05 PROJECT INTENTIONS

Subjective Repair: Shift in Perspective

The Subjective Repair is more closely linked with a perspective shift of seeing and treating the River as a living entity that provides multi-benefits for humans and non-humans while also being connected to larger systemic functioning. This paradigm shift moves away from the river as a source for human exploitation, moving towards a spiritual source of wealth to be shared with all, and not be abuse of. This perception comes in link with olden Celtic and Galish Tribes which settled along the Seine in the Iron Ages. The Seine was named after a goddess, Sequena, and was given a human or living representation. This makes us believe that they perceived the River as a Living Entity.

This paradigm shift is also translated through the movement towards the Rights to the River, where bodies of water are given judicial agency notably to enforce respect of the river' s "fundamental right to exist, to prosper, to regenerate, and evolve" and "it' s inherent rights to restoration, rehabilitation, and conservation" (Laurent, 2018).

"The laws we have are not rising to the threats we face. Legal structures that treat rivers and nature as an object for human exploitation are enabling today' s crises. A Rights of Nature approach offers transformative change at a time where it could not be needed more."

Monti Aguirre, Latin America Coordinator at International Rivers (...)

Sequena, Godess of the Seine, Healing Shrine, Gallo-Roman Religion, 1st Century BC

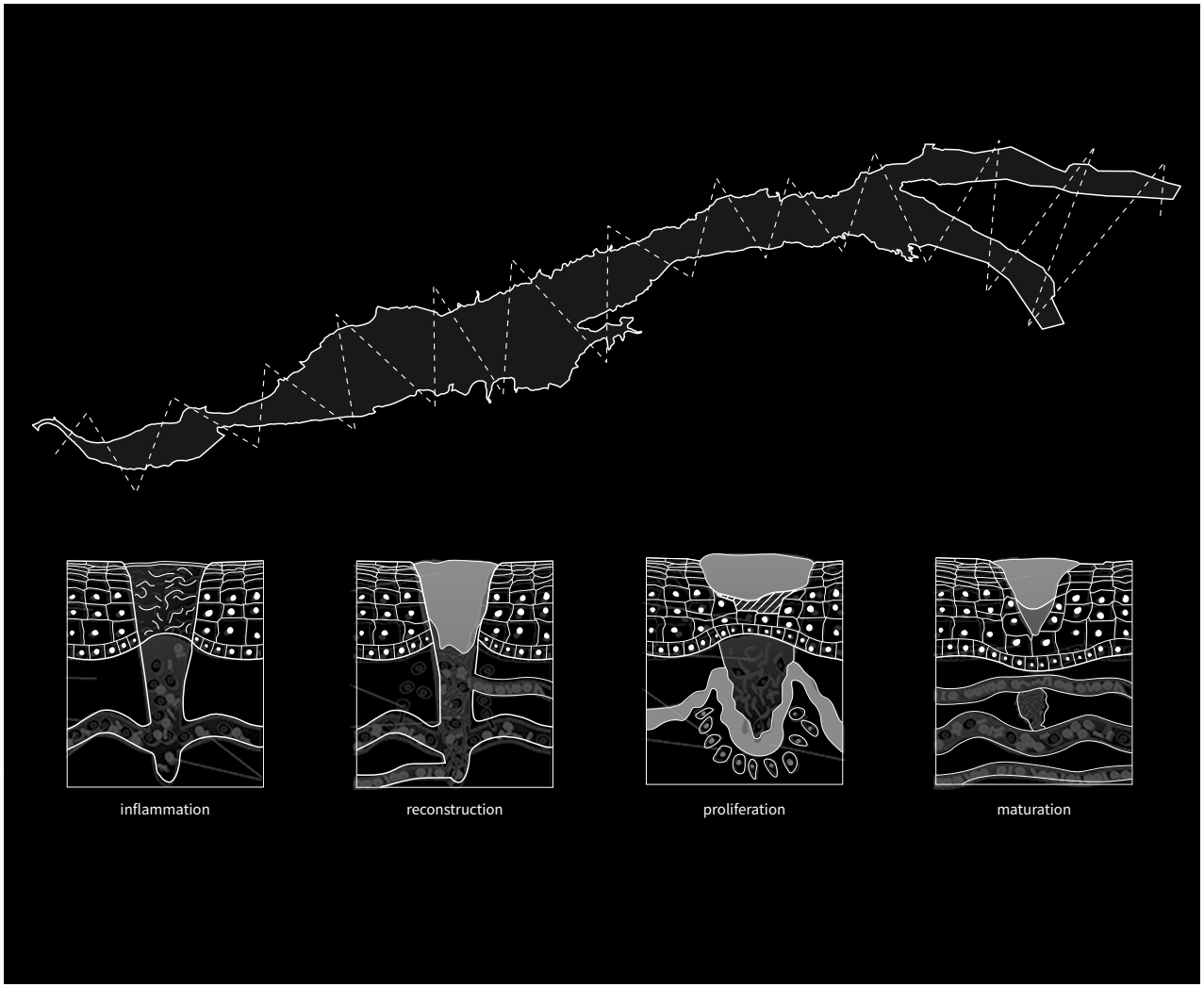
The notion of ‘reparative’ hold strings with the reparative system that an organism starts when damage is experienced. Thinking-with this, we propose the reparative as the starting point for noticing life-giving potentialities that goes beyond the Anthropocene and exploring what emerges in the ruins.

Emmy Laura Perez Fjalland and Kristine Samson (2018)

Physical Repair: Healing and Stitching La Bassée

This more objective and physical perspective outlines how the river and its floodplain have been fundamentally altered and damaged and how those actions have had cascading consequences on the functioning of specific systems, that are not only vital for the functioning of the landscape but for the wellbeing of communities who depend on the area for vital needs. This repair borrows from an organism’s reparative system which identifies damage and through a multi-agent temporal heals (Perez Fjalland & Samson, 2018).

Here, humans and spatial practitioners have an important role as mediators and agents of repair. While nature is elaborate enough to heal itself and continue to prosper, we must allow and facilitate this process while potentially providing co-benefits to society. In that sense, by healing La Bassée we can answer anthropogenic problematics that have been damaging human habitation, such as floods, water quality deterioration, warming climates…



06 REPARATIVE VISION
06.05 PROJECT INTENTIONS

Spatial Principles

The following principles translate the design intension into spatial actions to follow and adapt to the specific context. This allows for a synthesis of actions to be perform in order to achieve the goals put forth. These include:

(1) River as a Gradient of Wetness – looking at the rehabilitation of wetlands and water retention basins.

(2) A chemical and nutrient exchange between non-polluted bodies of water as to avoid stagnation and unfertile growth of algae.

(3) Allowing floods to replenish soils and riverbanks with sediments. The river has historically been the source of fertility for lands in its flood plain, by channelizing and controlling the water level, this fertile exchange between water and land cannot occur.

(4) Softening banks of former quarry sites as to facilitate a gradient of aquatic and terrestrial vegetation to colonize the banks, offering a diversity in non-human habitat.

(5) Create islands of rest within the water ponds. If the formerly inundated quarries are too large in area, the land and water interface is minimized creation less potential for renewed qualities of fertility.

(6) Allow for a temporal growth of vegetation. Pioneer species will most likely be the first to colonize post-extraction landscapes within 1-2 years, but it takes more than 10 years for an establish ecosystem to flourish. Allowing for ecosystem to get to an established state will enhance their ecological performance.

Design Intensions

To heal and repair La Bassée three well defined intensions are put forth:

(1) The re-establishing of More-than-Human territory:

-Protecting and Enhancing Biodiversity

- Creating habitat for divers and active amphibious ecologies

(2) Re-thinking the idea of a River - beyond the drawn straight line and into Gradients of Wetness

- Creating active edges adaptable to changing conditions

- Allowing chemical and nutrient exchange between water bodies

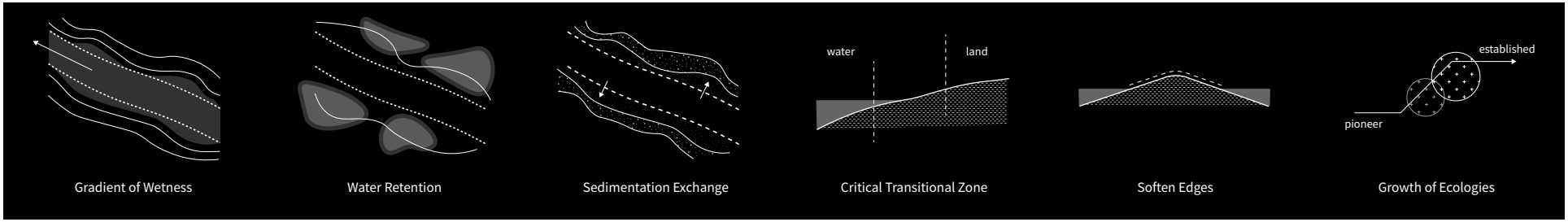
- Facilitating the sedimentation process

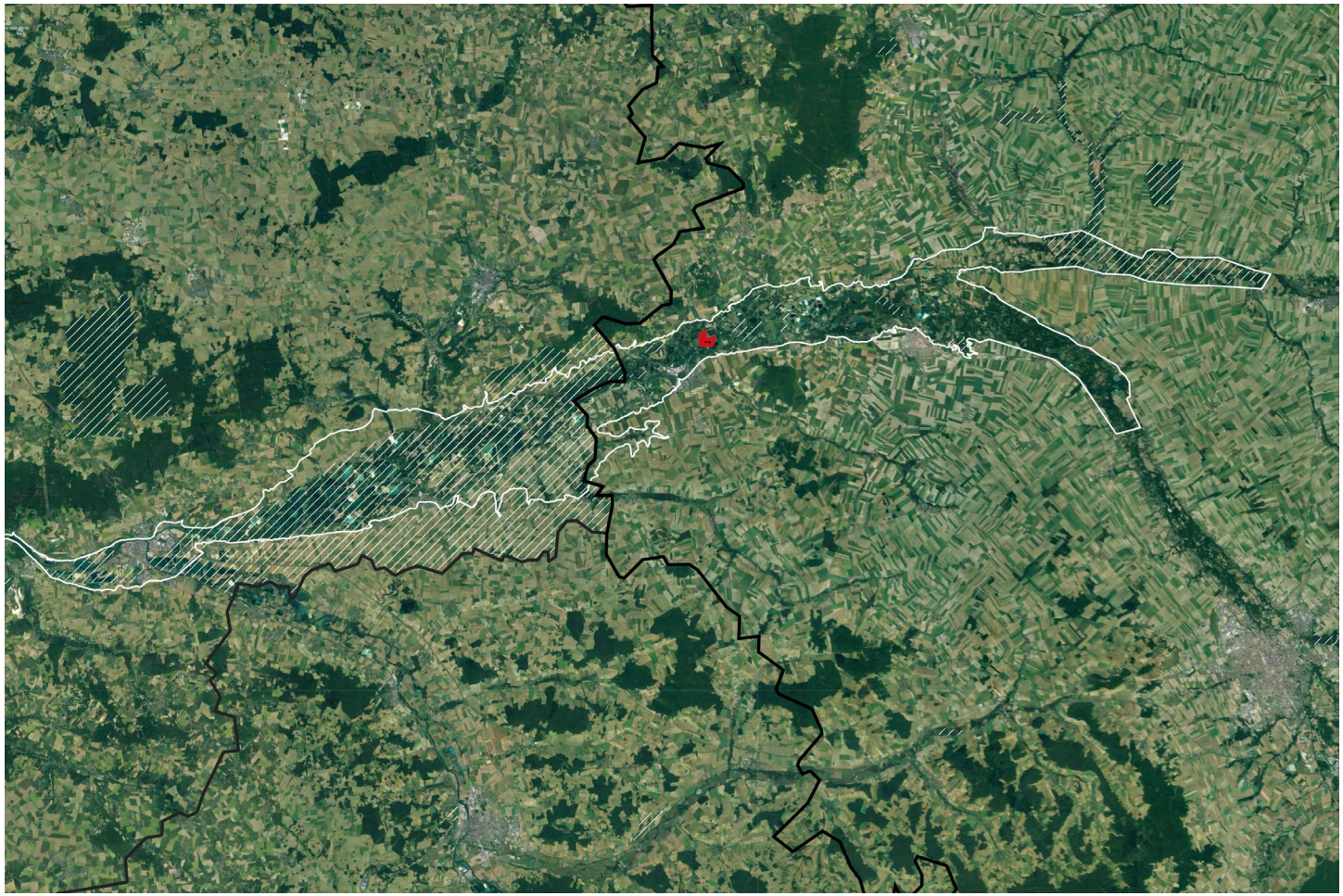
(3) Providing co-beneficial interventions in the adaptation to the New Climatic Regime (Latour, 2018)

- Allowing for natural flooding to enhance soil fertility and provide flood defense through water retention

- Enhancing water quality and allowing ground water replenishment

- Adapting flora to new geological conditions as climate stabilizer and non-human habitat


Gradient of Wetness
Water Retention
Sedimentation Exchange
water
land
Critical Transitional Zone
Soften Edges
established
pioneer
Growth of Ecologies



06 REPARATIVE VISION
06.06 HEALING LA BASSÉE

Design Deconstruction

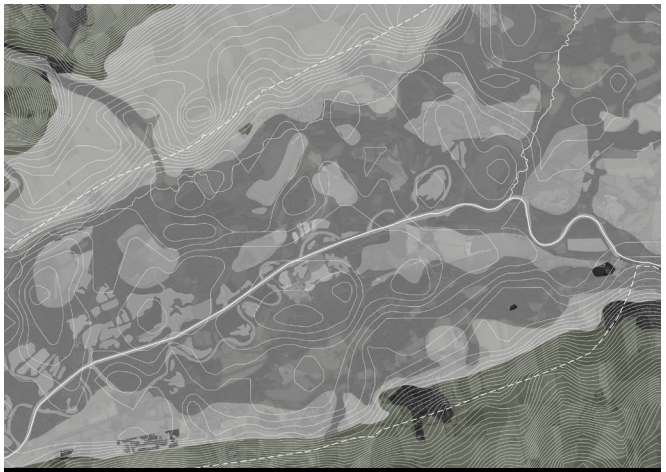
To best understanding the site and its spatial potential, a deconstruction of the current state of the landscape was performed. This deconstructed outlook allowed to isolate various elements and best understand how they can serve as the stepping ground for the design proposal. The reparative design in its essence looks at working with the current state of damage and transform limitations into opportunities. By considering the current state of the surface and subsurface landscape, we can arrive at strategic entry points to establish a system of repair - fostering new ecologies and a renewed sense of fertility. The inundated quarry sites for example serve as the backbone for the wetland system that is proposed. The topography and geomorphology are the driving structural elements which serve as agents of change to which the hydrological system is a response of.

Development of Repair

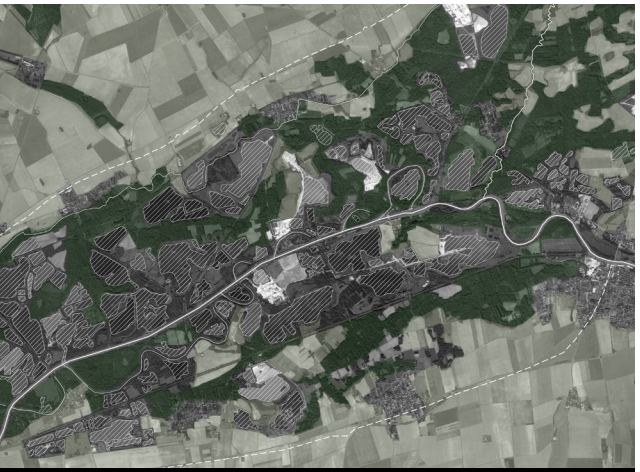
The process of establishing new systemic functioning in landscapes is time sensitive, and while an end goal is expected, there are many unknown factors which could limit or alter the expected outcome.

Here the design plans on rehabilitation a wetland zone in the alluvial plain. By connecting former quarry sites between each other and with the larger riverine system, a constant flow of water can be ensured as to limit stagnant and non-nutrient rich water quality. This also allows for aquatic species to circulate freely in the wetland and riverine system. The repaired dynamic waterbodies are accompanied by the development of a green network which strengthen the link between water and land, allows for a more diverse ecosystem. This green network is a gradient of semi-aquatic vegetation to forested areas which differ depending on their proximity to the waterbodies. This wetland system also serve as for water retention in times of heavy discharge, alleviating potential for flooding downstream.

(1) CURRENT STATE OF



(3) GEOMORPHOLOGICAL COMPOSITION



2) INUNDATED EXHAUSTED QUARRY SITES

(5) ENTRY POINT FOR REPAIR

(6) DEVELOPMENT

(4) ALLUVIAL RIVER POTENTIAL

(7) FLOOD PERIOD

(8) GREEN NETWORK DEVELOPMENT

06 REPARATIVE VISION
06.06 HEALING LA BASSÉE

New Geological Formation

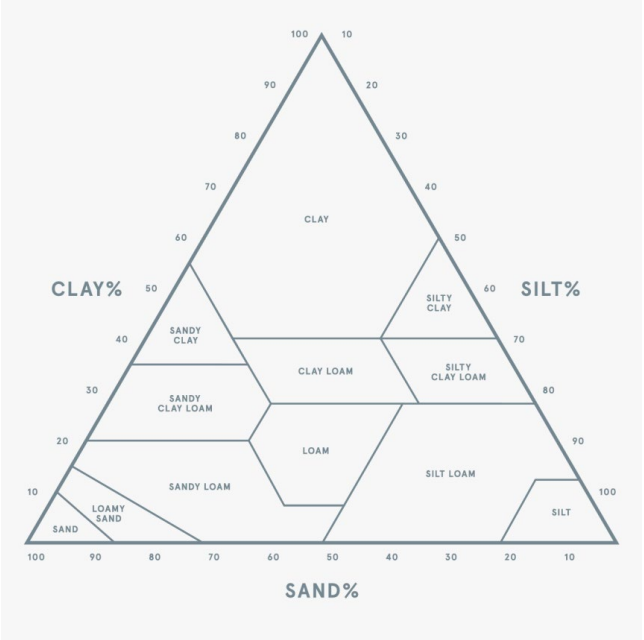
The extraction process of sand and gravel has been done until the water table is reached hence the resulting inundated artificial ponds. These are directly filled through this subsurface water and land exchange. The bottom layer of these post-extraction quarries is most often a layer of cross contaminated materials: a mixture of sand, gravel, and chalk. One of the characteristics of these ponds' direct connection to the water table is that they are subject to yearly fluctuation as the water table decreases or increase in times of rainfall or drought.

Between each pond remains a strip of sand and gravel, a pervious material signifying a water exchange through matter between the various water bodies. This creates a systemic evolution of all adjacent or connected waterbodies, meaning the water heights of all ponds fluctuate in unisons throughout the year.

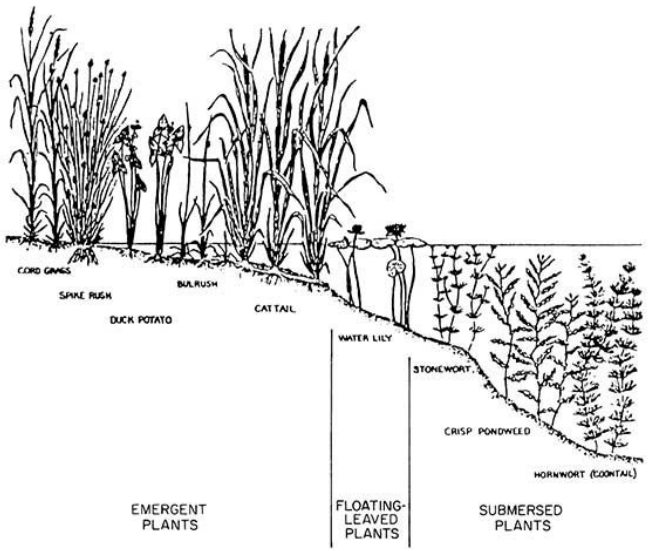
Flood Response

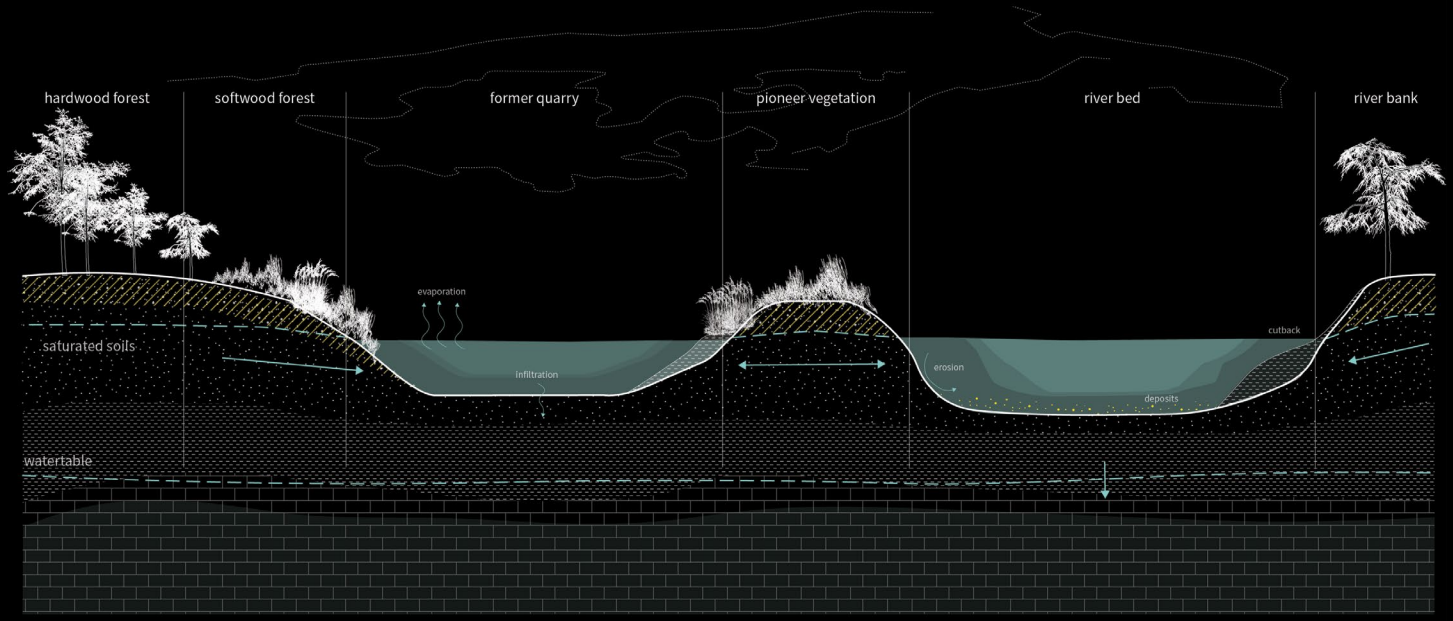
In times of particularly heavy discharge, the river will be able to exchange with the connecting and adjacent water bodies both through surface and subsurface exchanges. This exchange can be done naturally through soil structures and strategically placed openings using typography as an agent of movement. The partial storage of water will also create a nutrient exchange between the bodies of water and the river as to fertilize the soils of the edges. As the peak discharge decreases, water can then reinfiltrate into the flowing river, exposing certain part of the marsh lands and creating opportunities for new vegetations to settle.

Soil Structure and Properties Diagram

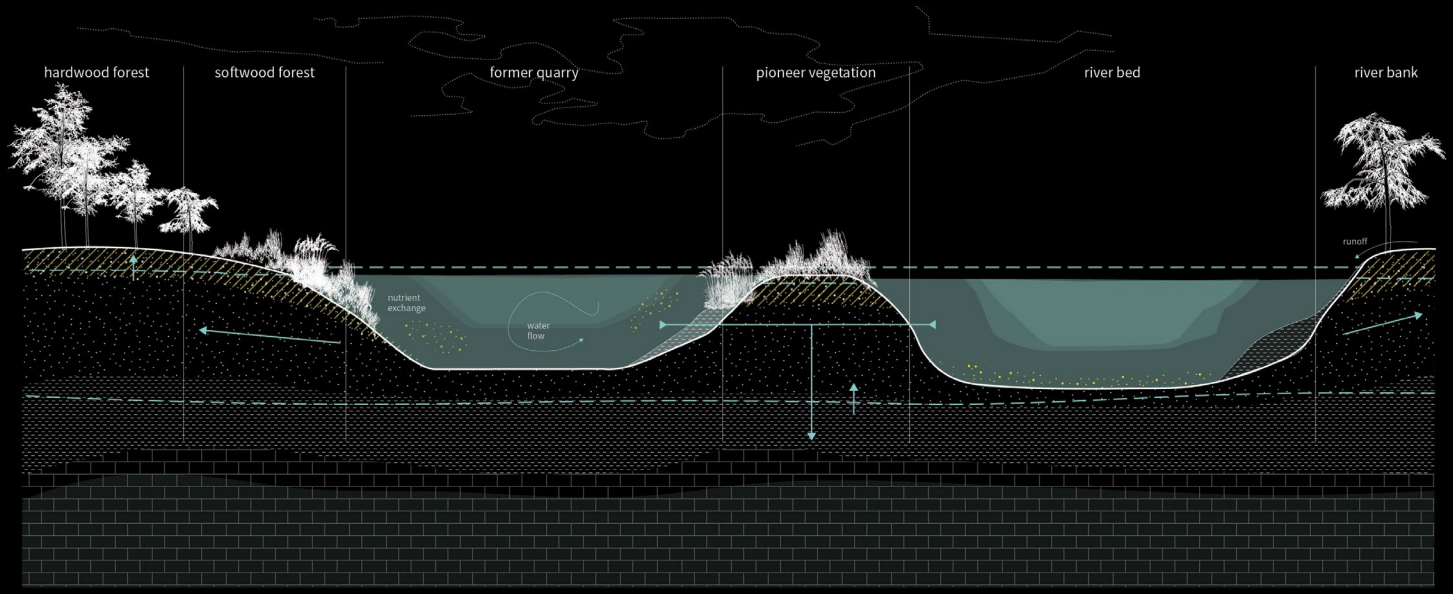


Aquatic Vegetation Gradient,
Iowa Departement of Natural Resources (2005)





Projected State



Projected State: Flood Event

06 REPARATIVE VISION
06.06 HEALING LA BASSÉE

Development Phases

As mentioned previously, the development of landscapes and their ecologies is a time sensitive occurrence that depend on many ecological, hydrological, and climatic processes and uncertainties. Therefore, it is hard to anticipate its evolution. While there are no finalities in nature but just waves of succession, here represented in these collages are the provisional steps in the development of a marshland on a former quarry site. The first phase will look at rehabilitating the site, ensuring water quality standard, and working with the existing condition to soften the edges. Then, pioneer vegetation will start establishing themselves on the restored edges of the water bodies. These pioneer species will invite other vegetation to settle acting both as water purifiers and structural elements guaranteeing soil stability. The public will be invited to interact with the landscape, witness its evolution, and learn about its history and the ecological processes that are acting in real time. As time continues, floods and other unknown events will fluctuate the state of the wetland and its edges, while allowing renewal, nutrient exchange, and offering diverse opportunities for habitat.

Urban soils - excavated for the development of the Grand Paris Express - are used as the foundational structure new landscapes - highlighting the connections between urban and territorial - through materiality, processes, and cycles...

Current State

Pioneering State (2-3 years)

Established State (5-10 years)

Flood event (5-10 days)

1. Former state of post-extraction landscape

2. Excavated soils as structure for new ecologies

3. Construction debris as gravel pathways

4. Allow for developement of established state

06 REPARATIVE VISION
06.06 HEALING LA BASSÉE

Landscape as Technology

These two section details provide an x-ray vision of the developed landscape of both a wetland and a fluvial forest ecosystem. Here we uncover the ways in which natural elements are used as technologies to enhance landscape performance and establish a rich network of bio-eco-geologies.

Some technologies include:

- Tree roots as soil structure as to limit erosion.

- Vegetation as water purifier ensure high water quality both in the wetlands and in the subsurface.

- Marshlands and semi-aquatic vegetation as habitat for various species to settle and hid from predators.

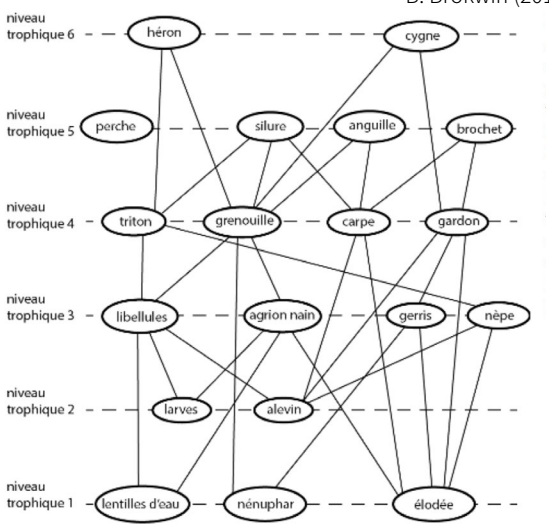
- New exposed geological layers such as clay allow for slower infiltration as to ensure constant water levels in the water bodies.

- A mixture of clay and sand, found throughout the areas are applied on the edges as to secure fertile soils for vegetation growth and facilitate runoff towards the water bodies.

Bio-Eco-Geologies

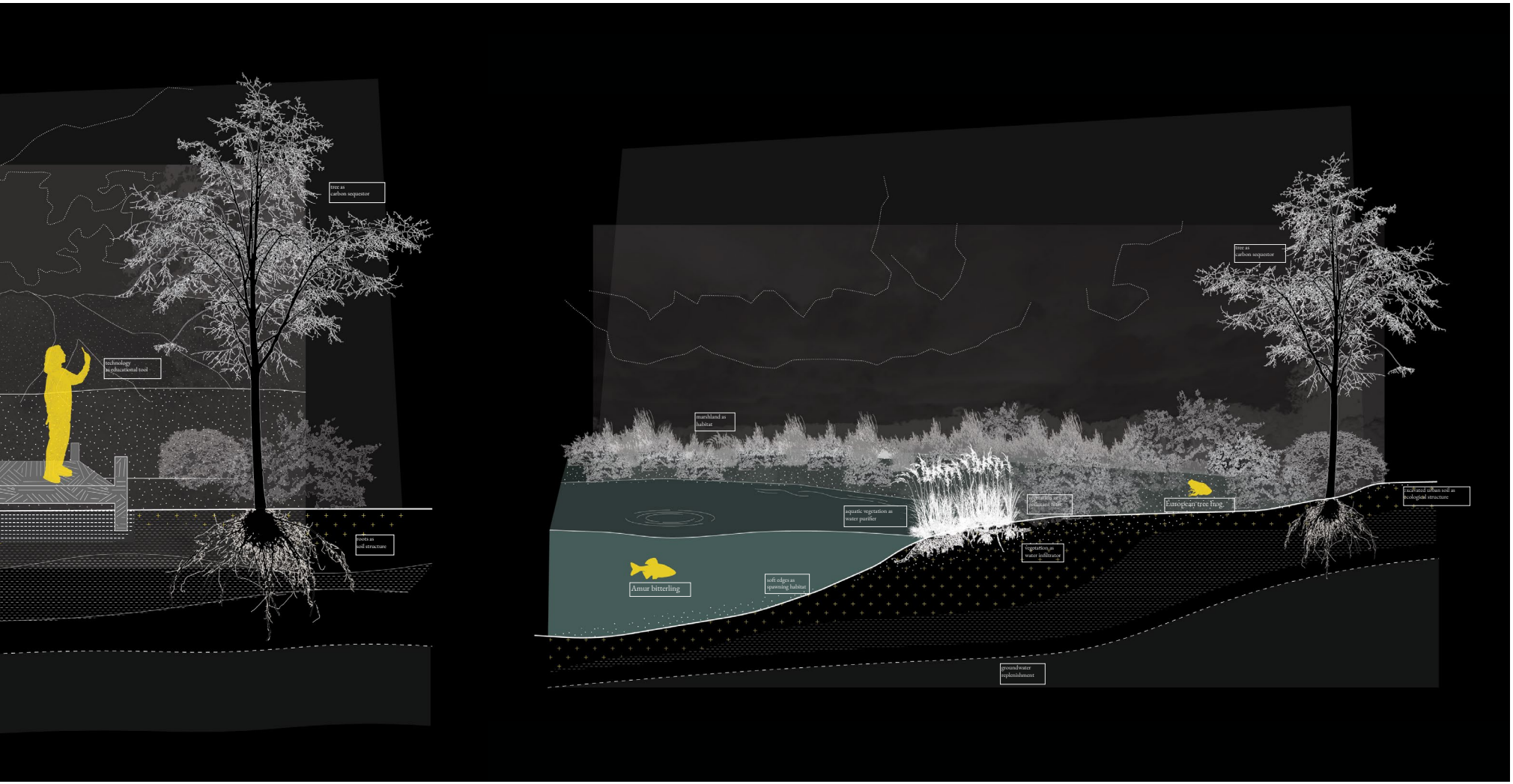
While the diagram underneath also to understand how biotic ecosystem functions as network, it is important to state and perhaps expand on the role of abiotic elements, such as water and soils, in providing structure for such system to flourish. Specific conditions relating to habitat diversity and choice of vegetation will allow other branches of a network to be activated, creating more a complex and resilient biodiversity.

Diagram of Ecosystem Network
B. Brokwin (2016)



Ecologies of Repair: A network of relationships between people, animals, objects and other materials whose capacity of agency, practices, and creative social force can rebuild broken links, damaged ecosystems, and obsolete insitutions after an intense stress or shock.

(After post-humanism theory: Tsing, 2015 ; Haraway, 2016 ; Braidotti and Bignall, 2018 ; Blanco-Wells, 2021)



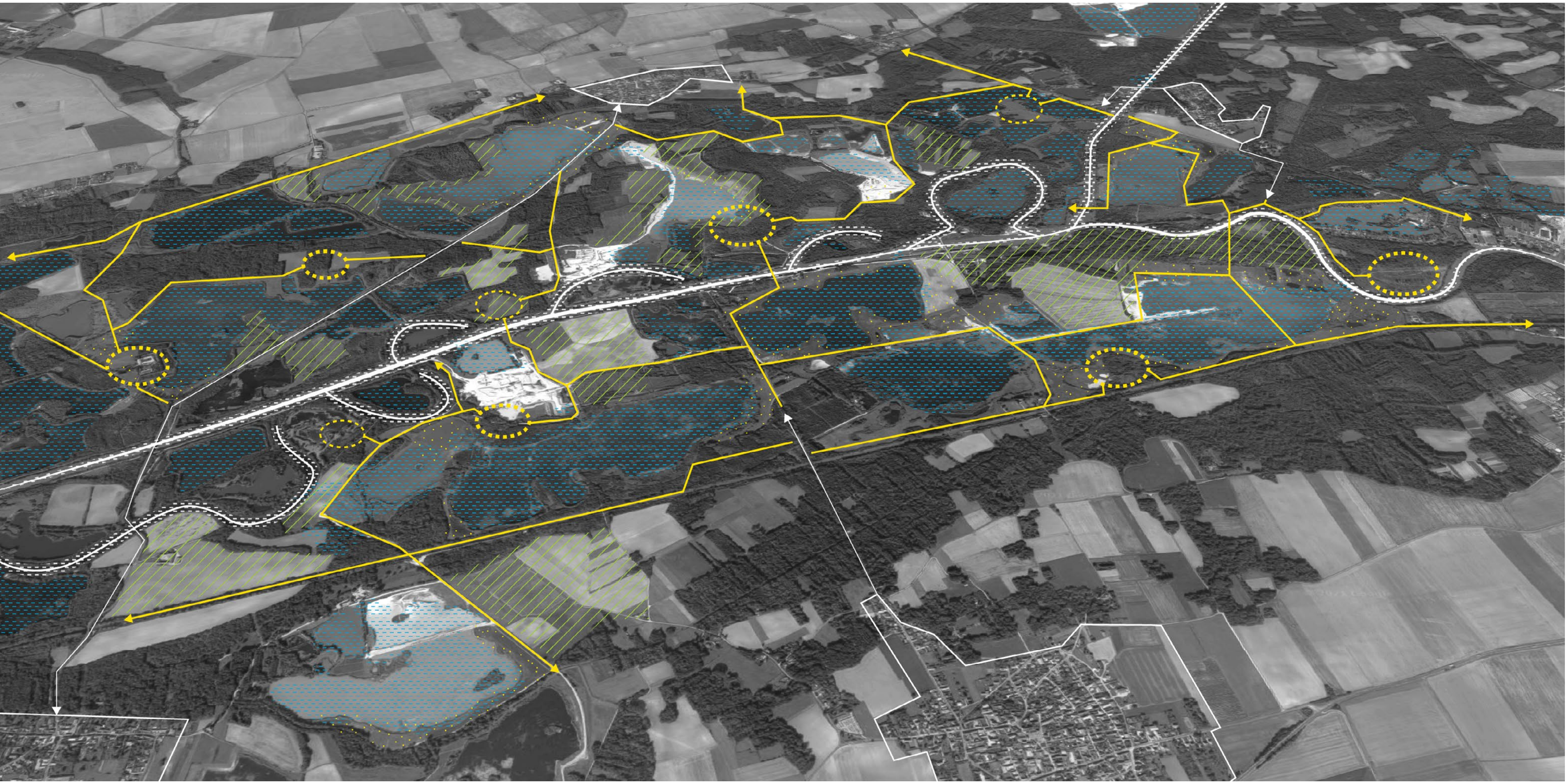
06 REPARATIVE VISION
06.06 HEALING LA BASSÉE

Site Functioning

The reparative design elements all mentioned above allow for the functioning and symbiotic development of the landscape as a whole. Water exchanges are facilitated through openings which connect the preexisting inundated sites as to form larger bodies of water. Strategic openings are created as to enhance a dynamic exchange between the flowing river and the slower-moving waters of the wetlands. The river acts as a catalyst for the establishment and wellbeing of the wetlands, providing nutrient exchange and water flow. On the other hand, the wetland provides relief for the river in times of heavy discharge, ensure spawning habitats for aquatic species, and allows for the water table to replenish. Edges are sloped and restored, and soil structure is ensured through the presence of deep root trees.

Multi-Program Integration

While the establishment and functioning of ecological systems are the priority, it is primordial for humans, local and regional communities, to interact with the new dynamic landscape. A network of walking and biking path which builds off of preexisting road networks allows for the public to witness the changing landscape, learn about the site' s history and the ongoing processes of ecological functioning, observe local fauna, and follow the development through the years of new ecosystems. Various programmed hubs invite the public to take part in the reparative process. Workshops and infographic panels allow for leisure walks to become educational sharing information and knowledge in a intergenerational way.



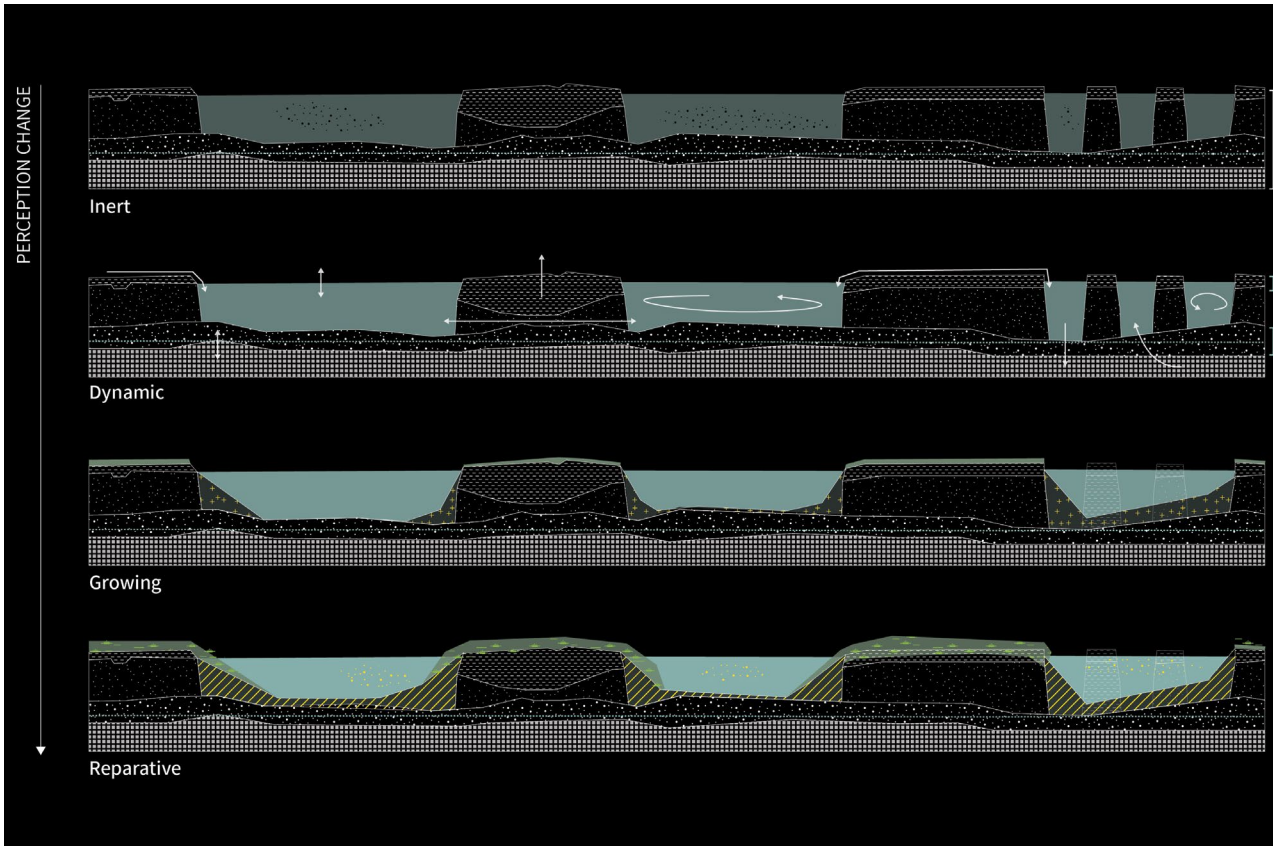
Monitoring Station | Education Center | Interactive Extraction | Wildlife Observatory | Wetland Observatory | River Park

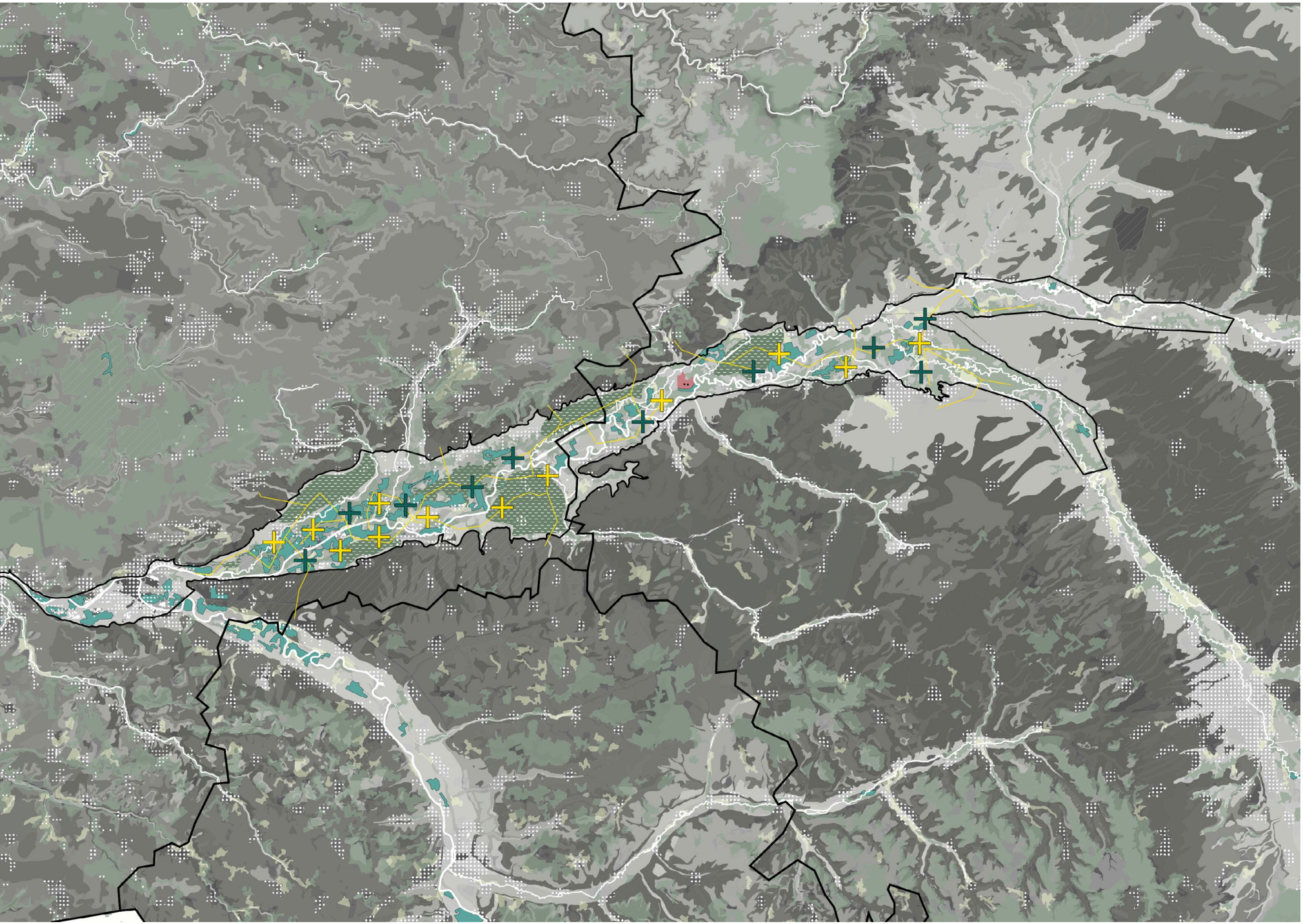
participating ◄- ► observing

06 REPARATIVE VISION
06.07 LA NOUVELLE BASSÉE

Upscaling Reparative Design in La Bassée

While this project dove deeper into a portion of La Bassée, the design strategies and intentions can be replicated throughout the entire alluvial plain, further enhancing the ecological qualities of the region and increasing the efficiency of the area as a water retention and flood defense nature-based-solution. Through these interventions, a possible stitching of human and non-human activities and processes are possible.

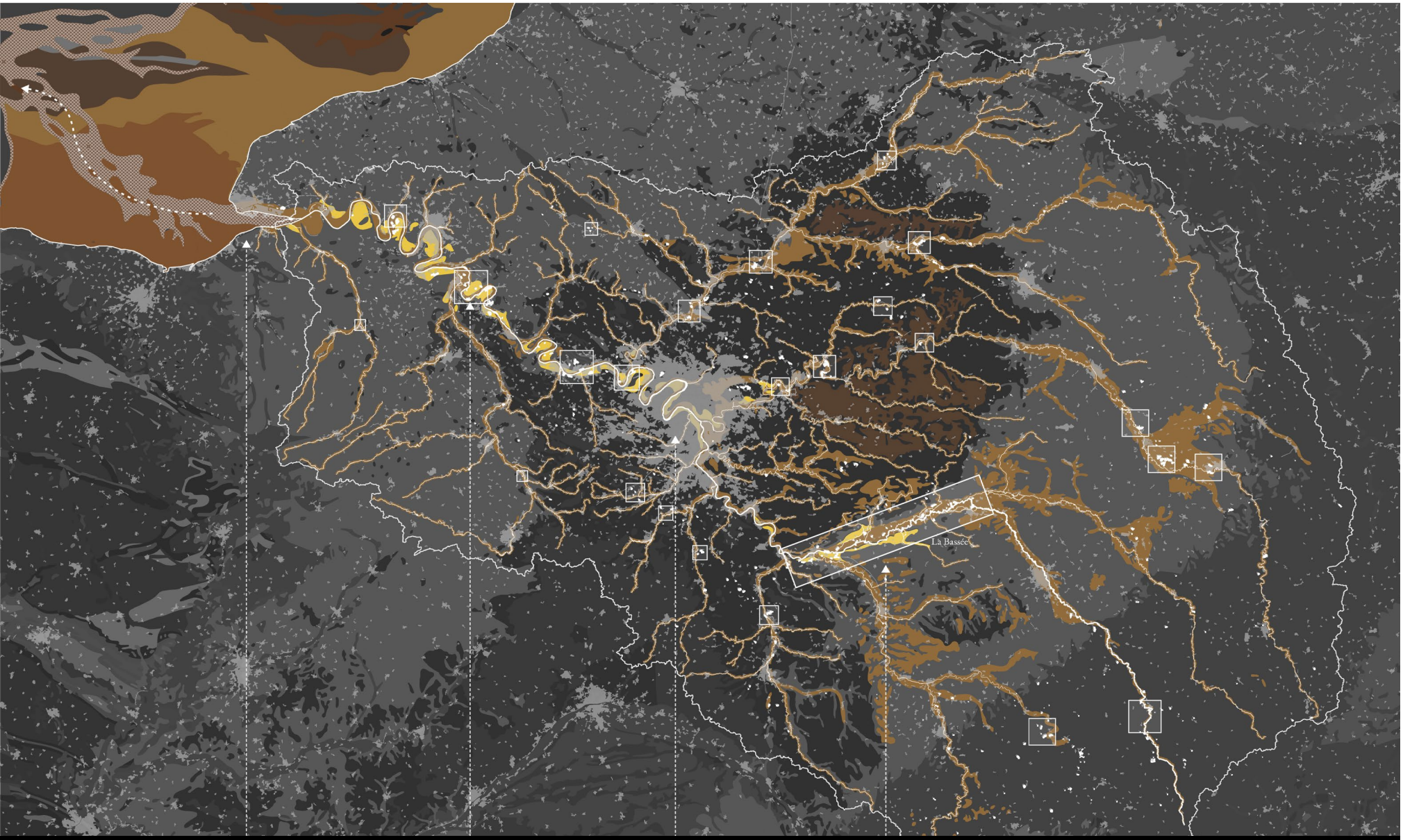


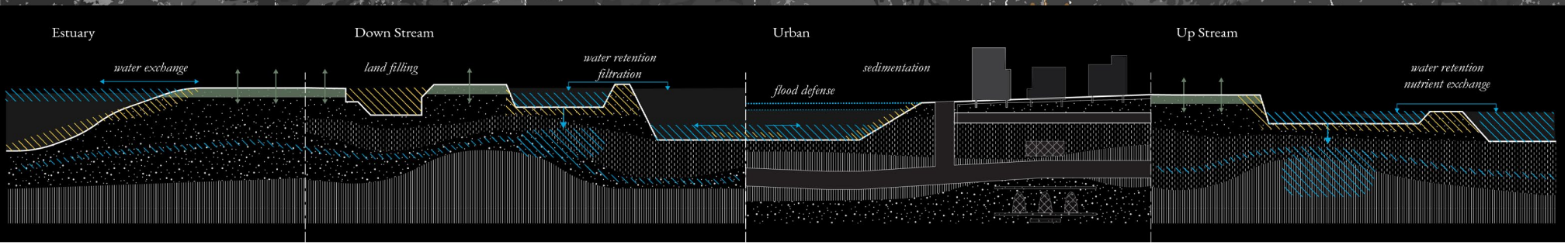


06 REPARATIVE VISION
06.08 TERRITORIAL VISION

Territorial Replication of Reparative Design

The reparative design interventions proposed for the site of La Bassée could be scaled up even further and applied on the entire watershed territory. Quarries and sites of material extractions are found along the tributaries of the Seine River and if repaired would have an even greater impact on the riverine functioning, and material balance of the basin. While quarries are minor in size compared to the scale of the territory, if they were all to be repaired, offering hubs for local ecosystems and communities to interact, offering varrying degrees of water retention in times of peak discharge, nutrient exchanges, enhance critical water and land interface, a new definition of material cycle could be observed in the watershed. These interventions would also have an impact on the Seine River' s estuary and beyond, seawards. While it is hard to quantify and precisely evaluate the impact of multiplying these interventions at a watershed scale, it can be said that they would provide definitive qualitative enhancement at a local scale.


La Bassée


Estuary
Down Stream
Urban
Up Stream
water exchange
land filling
water retention
filtration
flood defense
sedimentation
water retention
nutrient exchange

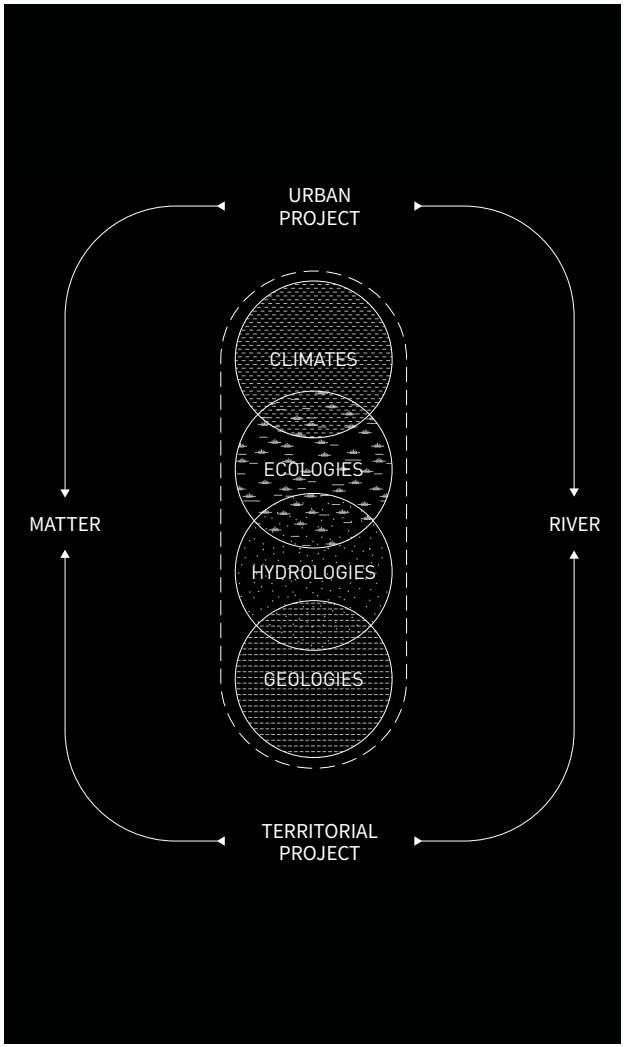
06 REPARATIVE VISION
06.09 EVALUATION

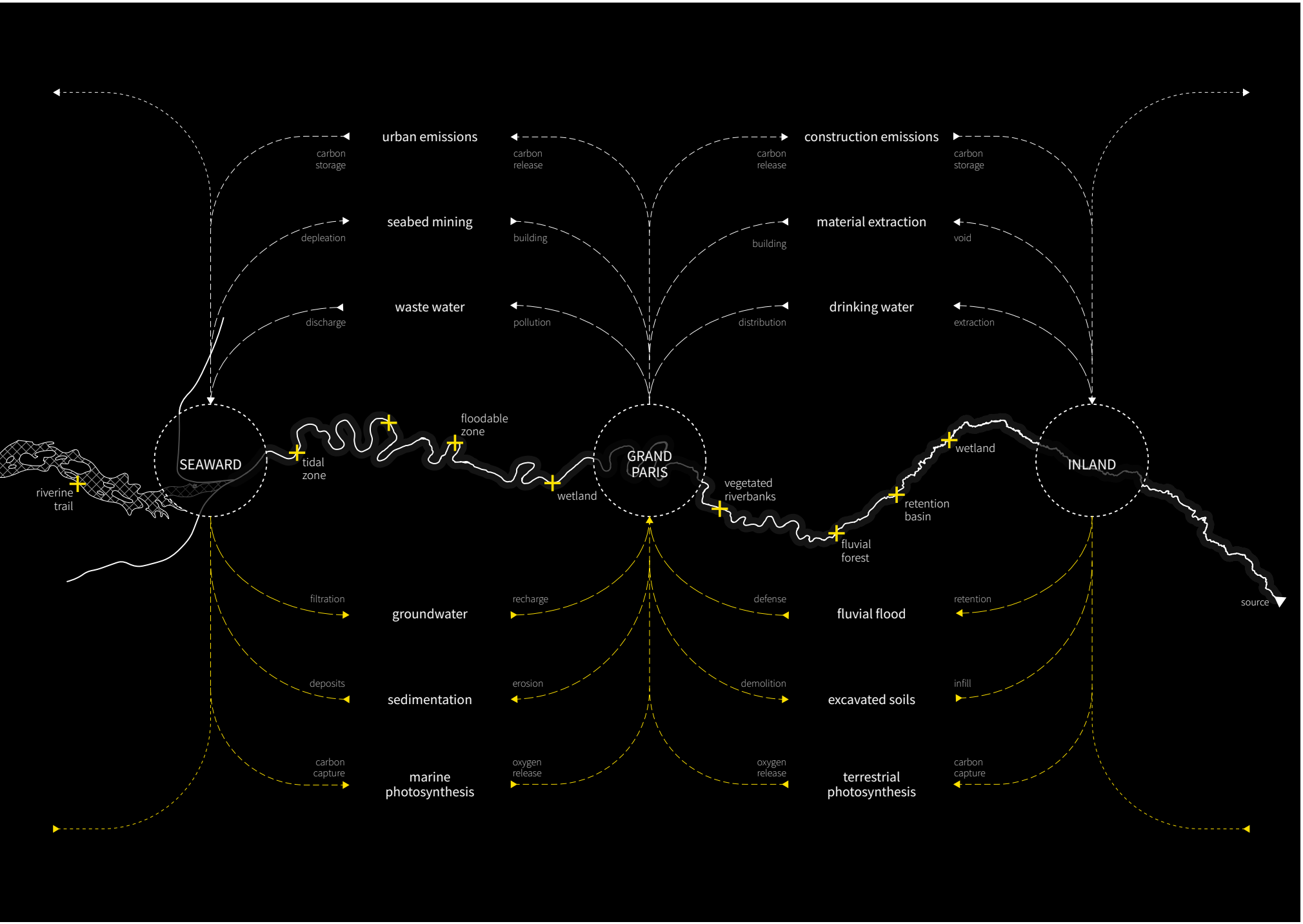
Impact on Bio-Spheric Cycles

What can be said is that this project intends to integrate post-extraction sites, characterized as damaged, into a dynamic co-beneficial system that enhances ecological landscape functioning, positively impacts the hydrological system through replenishment, retention, and purification, and creates opportunities for renewed socio-ecological interactions. By applying a paradigm shift on how these landscapes are perceived, this project is able to surpass the conception that these sites have exhausted their potential and create renewed qualities of fertility: "understanding what emerges in the ruins and exploring whether there are possibilities of life that goes beyond the Anthropocene" (Perez Fjalland and Samson, 2018).

Here are represented some of the processes that shape 3 vital cycles, the carbon, the material, and the hydrological cycles that unfold and embody the relationship between the urban and the territorial. The top portion outlines the process that are dictated by the urban – processes of depletion and negative externalities. The bottom portion are processes that ensure a balance and counter act processes of depletion towards resource replenishment. The river and its multiple interventions proposed become facilitators of this replenishment process ensuring that resources remain in a dynamic system.

This diagram starts to outline a co-constructive relationship between consumption in the urban and natural production in the territorial.




urban emissions
carbon storage
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construction emissions
carbon release
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seabed mining
depleation
building
material extraction
building
void
waste water
discharge
pollution
drinking water
distribution
extraction
SEAWARD
tidal zone
floodable zone
GRAND PARIS
wetland
riverine trail
vegetated riverbanks
retention basin
wetland
fluvial forest
INLAND
source
filtration
groundwater
recharge
defense
fluvial flood
retention
deposits
sedimentation
erosion
demolition
excavated soils
infill
carbon capture
marine photosynthesis
oxygen release
oxygen release
terrestrial photosynthesis
carbon capture

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07 CONCLUSION

07 CONCLUSION

How can the **process of urban development** in the Grand Paris become a **catalyst for repair** of **damaged landscapes** in the Seine River Basin?

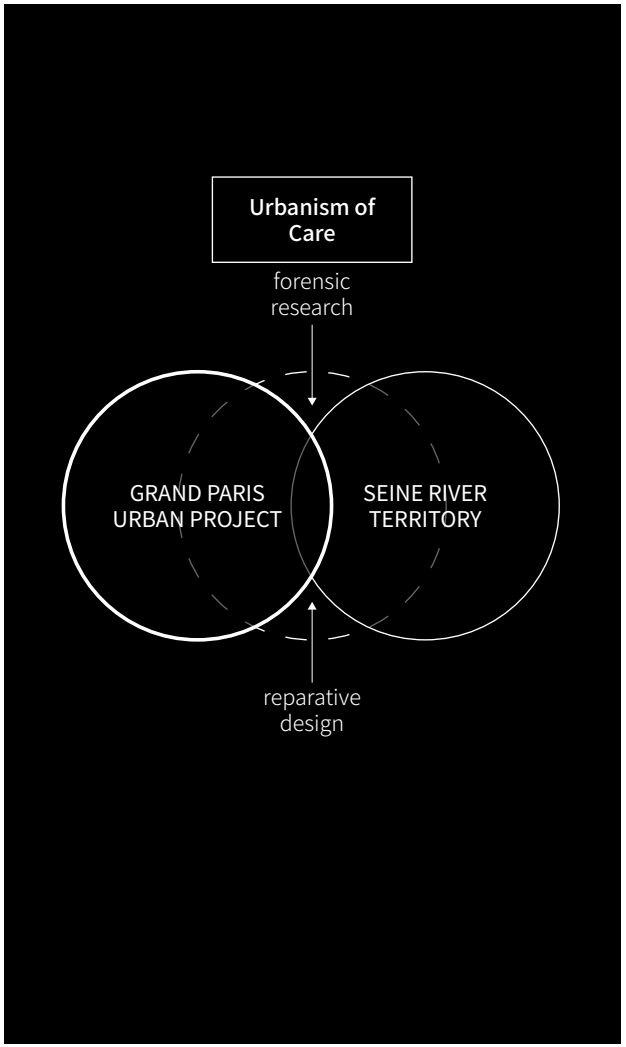
Research as Project

The Atlas allowed to comprehend the dynamics that entangled the urban project of Paris and territory of the Seine River Basin, while the relationship was deemed unilateral, with the urban benefiting from resources, space, and energy and the territory suffering from material exhaustion, systemic disconnections, and nuisance from pollution, the design project looked to formulate opportunities from damaged sites and exhausted geologies towards co-beneficial interventions.

In answering the research question: the process of material extraction intended to answer particular socio-political and economic agendas in and around the city center allowed to highlight opportunities for repair that surpasses the initial damage. These extraction sites serve the possibility to tackle a range of problematics the urban areas are confronted with that go beyond the boundaries of the sites such as hydrological uncertainties and climatic disturbances. The intensity of the urban transition, creating countless extraction pits around the riverine environment, allows for the replication and increase of impact of the application of reparative designs.

While Paris has historically been the site of large-scale urban transformations that have re-structured socio-cultural landscapes, perhaps these urban plans coupled with large-scale reparative visions could ensure the prosperous functioning of both the urban and the territory.

While the urban project has been defined as a political and engineering construction, this project points as to how the territorial project could be synonymous to a different type of constructed landscapes: one that follows the politics of climates and construction blueprints of eco-geological systems.



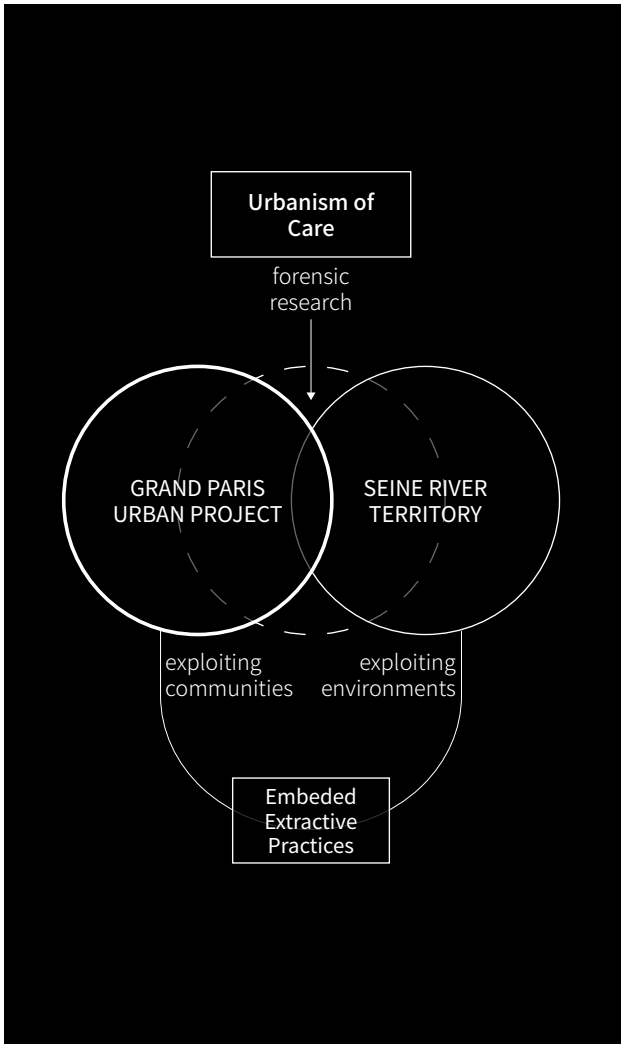
Process as Project

While modifications to the environment long aloud for the possibility for humankind to prosper, with little visible or quantitative impacts, we have entered an age where we witness the consequences of past actions and the unforeseen domino effects changes have had on the environment. While we once were the drivers of landscapes changes, those changes are now occurring faster and beyond our 'control' – a control that was only a perception and not a reality.

This design project is not 'just' a proposal for the revitalization or restoration of formerly quarried sites, it goes beyond that. This project offers a shift of gaze from the centrally place Paris to the larger watershed system – as it is the base for our habitation. The urban project of Paris has historically been dependent on the Seine River' s functioning – for vital resources, logistics, and habitat. The ecological functioning of the river must now to become the main criteria to quantify human potential for progress – beyond the urban. There is no other possibility if we want to ensure multi-generational prosperity.

This project does not offer a design as a solution but an opportunity to learn and understand what the embedded functioning and dynamics exist within a riverine environment – and how to best allow those to unfold. Long have architectural interventions (including engineering objects) suppressed natural functions as to make efficient a single-minded anthropogenic function. The invisible hand of the planner or designer has been more damaging than constructive when looking beyond anthropogenic systems. Long have we intervened to solve problems that were cause by our interventions. This project does not offer a solution but a starting point to embrace the facts and realities of the natural world that supports humanity and provide insight on how anthropogenic systems can start aligning themselves with the larger systems at play.

This design exercice, which ends on a hopeful note where interventions on past-damaged sites could offer relief for the urban porject does not excuse or encounrage the destructive construction process occuring in the city. The design proposal offfers actions to start counteracting damage of past actions. Looking at the urban through the lense of the river gives the basisfor a perceptive change - one that should inform future actions.



08 REFLECTION

08 REFLECTION

Project Summary

This research and design graduation project aims to create a shared narrative between Europe' s current largest urban redevelopment plan, the Grand Paris, and the functioning of the Seine River Watershed. This relational outlook is intended to form nonlinear, dynamic, and procedural links between the urban and the territorial, highlighting societal and environmental challenges, placing itself at the junction between land and water, and between culture and materiality. This graduation project focuses particularly on the social, ecological, and geological destructive processes related to material extraction, looking specifically at sand and aggregate quarries used in modern-day concrete. The design interventions propose ways to re-integrate these damaged landscapes into the functioning of the riverine system – turning the results of destructive anthropogenic practices into opportunities. The design proposal formulates a reparative territorial vision which aims to heal environments using the post-extractivism geologies, landscape ecologies as technology and integrating water and flood management in the process. While matter has culturally been codified as material, allowing its de/re-territorialization to serve specific socio-political and economic agendas, this project identifies matter as the physical agent for change and the basis for human and non-human habitat – therefore integral to the foundation of every landscapes and allowing its systemic performance.

Process

Intensions and Research

I would like to begin by stating that this graduation project took time, work, and patience to arrive where it has: it is the result of a diligent process of *research through discoveries* and *design through choices*. While at times the hope of constructing a coherent and engaging narrative was lost due to the overwhelming number of requirements and deadlines, it took both perseverance and strength to arrive to a complete project I am proud of : *Ad Meliora,* always 'Towards Better' .

This graduation project begun with a will to work in the context of the Parisian Region looking closely at the Seine River Basin, following the condition of the Transitional Territories studio to work around a marine or riverine environment. While no specific intensions were formulated at the start, a curiosity sparked around the out-worldly looking sites associated with the material extraction process through an initial spatial exploration (done primarily through satellite and street view imagery). As the research process continued, I looked to link the large-scale urbanization project of the Grand Paris with the evolution of these extraction landscapes as they relate to riverine ecologies. Formulating this intension was a key step in the process which allowed to organize the research material.

The multi-line of inquiry analysis (commanded by the TT studio) allowed to further define the problematics of the context and create links between the various dynamics unfolding on the territory. While at times seemingly confusing the process of defining the project – *mapping the undefined is a process of discovering the unknown* – these lines of inquiry (Matter, Topos, Habitat, Geopolitics) revealed perspectives that would otherwise not have been explored: such as the importance of geological formation in constructing the urban project. This analysis, done at the scale of the watershed and at a time when the project remained vague, helped in defining the current state of the territory. In the end, the four lines of inquiry have guided the project and matter became the driving force behind the design phase.

For this project, it was primordial to clearly define outputs to structure a clear, coherent, and relevant narrative. Before that, I struggled immensely in making sense of the overwhelming amount of information I had gathered and had a hard time projecting where I wanted to arrive at. During my P2 I propose three specific outputs which ended up unlocking a natural workflow and allowed for the efficient development of the project up until the P4. First, an Atlas of Critical Cartography which builds the broad intertwined narrative between the urban project and the riverine territorial project. Second, a Forensic Exploration performing more in-depth cross-references associated with the current transition in the Grand Paris between urban politics, urban development, and material extraction. And finally, a Reparative Vision which allowed to zoom into a specific site (La Bassée) and propose a design to repair and heal damaged landscapes while incorporating co-beneficial social and the ecological interventions for the humans and the non-humans.

Methodology and Approach

This project was conducted through the concept of an hourglass. Beginning at the largest end by conducting open ended macro scale research, wide data collection, and broad literature review, and uncovering the multiple possible problematics (P1). Then, restricting the point of entry by clearly defining a project, narrowing down to context-sensitive specificities which drive and organize the

narrative (P2). Finally, through design, multiplying the possibilities and reintegrating previously found problems towards proposing solutions (P4). This approach allowed to grasp in its entirety the multiple problematics of the territory, force educated choices to continue moving forward, and finally allowed disregarded elements to re-infiltrate the design project. This approach synthesizes a process that is far from being linear. Because I did not start this research with a clear goal, the first months were dedicated to exploring an overwhelming number of pathways. While I was trying to integrate everything into this less-than-a-year research project, I realized that I had to make concrete choices and focus on the relevant and necessary to continue moving forward. In hindsight, during the first months, I felt completely lost and inefficient, endlessly collecting articles, papers, and photographs, but in the end, a lot of that information has found its way back into my project and gives it a unique richness. While the process is tedious and non-linear, it seems it all makes sense in the end.

Data Collection

Data, both quantitative and qualitative, was widely accessible in the area through governmental agencies, satellite services, and previously conducted academic research. While the open access greatly eased the process of collecting data, there was an *overwhelming* amount of information. I had to force myself to stop collecting information, focusing on the bare necessities relevant to support my ideas, and, at times, accepting incompleteness. I had to constantly step back and reflect on whether this information was necessary to explore and include or not.

In terms of collecting data for mapping, open-source databases in France are often restricted to specific spatial boundaries (administrative regions, urban regions, cities…) To collect data for larger territories or eco-regions (as was the case for this project) which surpasses such boundaries, various datasets, which do not always utilize the same criteria, had to be constructed and merged. This time intensive endeavor allowed to surpass possible problems regarding data completeness. It was primordial to stay attentive to the specificities of the data provided as to avoid blind spots and prejudice. It also became apparent that data should not be the drivers in the mapping process, but specific intensions and purpose should.

Societal Relevance

In this project, the normalized processes of urban growth and development is challenged by highlighting both the societal and environmental externalities which constitute injustices in the territory. The built environment is based off an extractivist mindset which negatively impacts the most vulnerable communities and contributes to the ongoing degradation of the environment. While this project does not look to offer an alternative to extractive practices that shape the built environment, it engages with post-extractivism and proposes reparative design as a material practice towards repairing and healing. In this sense, linking landscapes of extraction to building projects revealed the destructive impacts of the materiality which the fields of architecture and urbanism engage with. It is societally important to uncover the 'invisible' effects of certain actions on landscapes far away. This project looks to highlight these sites of extraction and offer new fertility through co-beneficial intervention to mend for anthropogenic activity. Quarries sites along the Seine River are seen as spaces of opportunity strategically positioned at the critical junction between land and water. These sites can offer possibilities in ecological habitat redevelopment, water management, and flood defense. While critical, this research project looks to add to the continued effort to envision innovative ways to propel a more sustainable habitation of urban and territorial environments for both humans and non-humans alike.

Temporal Relevance

This research comes as a response to the large-scale urban transition currently occurring in the Parisian Region. While the urban plan is expected to have long term positive impacts on the city' s functioning and urban fabric, it is essential to point out the physical externalities associated with the project of the Grand Paris. By looking beyond the conventional urban space, this graduation project places a conscious spotlight on the considerable stress an urban transition of this scale places on the riverine environment. This project positions itself to offer pragmatic and reparative remedies to the anticipated increase in environmental degradation associated with the rise in material demand.

Scientific Relevance

My thesis project is based on the Transitional Territories perspective of understanding the urban project through the territorial scale. It engages with ecological, hydrological, and geological processes which surpass the fields of study of the Built Environment integrating a multi-disciplinary approach to Urbanism. While significant scientific papers were read and valuable inputs from my second mentor (Joep Storms, Associate Professor in Sedimentary Geology) and colleagues in the faculty of Water Management aided in furthering my conception of the challenges that sites of extraction posed, I believe there are limitations in my capabilities to evaluate the impacts of the proposed interventions. While this project was informed by ongoing context-specific research, a multi-disciplinary evaluation with specialized local actors

would be needed to offer more insight on the effects of the design project. These various perspectives were challenging to engage with as I lacked in-depth knowledge, yet they were necessary to understand and include as they revealed new ways to respond to the complex climatic and environmental crisis. After a couple of months, I can confidently state that my knowledge on fluvial dynamics, geo-morphological composition, and ecosystem chemical exchanges have never been greater.

Ethical Consideration

This project unveils overlooked links between spatial, social, and environmental justice associated with the urban development and material extraction process. Here, I take a stance to challenge the status quo put in place by bodies of governance and economies while offering possible alternatives to the conventional *modus operandi* through the material practice of reparative design. To grasp a full understanding of the diverging agendas and balance my potential preemptive bias, I conducted a thorough reading of the complex landscape of actors which surround the Grand Paris project: looking at sources from economic and political agencies, industry practitioners, and community groups. While I made a conscious effort to best inform myself of all thinkable perspectives involved in the Grand Paris and communities affected by my design proposition, no in-person or direct interaction was done with any local actors (through site visits or surveys for example). This limitation would have to be remedied to successfully apply my project in practice and strengthen the design proposal.

Generalize the Project

While the design project looks to resolve context-sensitive problematics integrating specificities such as the region' s history, its geological composition, riverine morphology, socio-political climate, and ecological systems, sites of riverine material extraction can be found near river' s all over the world. In that sense, this project does not create a universal blueprint for how to deal with post-extraction landscapes but adds to the conversation surrounding reparative practices. The design project focuses particularly on one site in the Seine River Watershed (La Bassée) but hints at replicating such actions on other sites in the riverine territory as to upscale the impact of the interventions into an integrated watershed system.

Relation to TU Delft Urbanism Track

The master track helped to provide a clearer understanding of the multi-layered landscape, the role humans have had in significantly transforming it, and the socio-environmental consequences of those actions. These realizations are derived from a technical perception of the urban environment, made particularly apparent in Fransje Hooimeijer' s SUET and Infrastructure and Environmental Design courses, in which we actively uncovered the functioning and impacts of various infrastructural systems.

Working on numerous cases in the Dutch context also provided an understanding of the extreme development of a constructed landscape: its opportunities and limitations when it comes to socio-ecological development and environmental risk management.

This program also provided students with the capability to move fluidly through scales from a site to a city to a region. This ease was employed in this graduation project as a driver to establish a holistic spatial understanding of the challenges.

Finally, this graduation project embodies both a social and ecological justice-seeking perspective. This approach was particularly fueled by courses offered by Roberto Rocco who strengthened my personal interests and understanding of the links between these injustices and offered insights to project more inclusive and sustainable futures. The first year of the Urbanism track at TU Delft was primarily composed of 2 to 3 month-long group projects which favored student-to-student learning and allowed for students with complimentary skills to arrive to a strong final project. It was a little bit of a shock to suddenly have to conduct a year-long individual research project with little guidance (in terms of choice of location and design objectives) but as the project comes to an end, I realize the gap I have overcome and the exponential growth I have had as a designer and academic researcher.

Relation to Graduation Studio

This graduation project looks at exposing and redefining the urban project as a territorial project, which coincidences with the studio' s aim to address the territory as a project. The studio fueled a unique outlook on the landscape as a fluid connector between living and non-living actors and processes, understanding the landscape as the result of multi-axis and dynamic regimes (land, water, habitation, politics) which intersect and influence one another. Additionally, the studio provided a strong conceptualization of the current state of the planet looking at the New Climatic Regime for example which urge to re-think patterns of landscape habitation to ensure potential re-calibration of space, time, and identity in the wake of a state of constant disruption (Latour, 2018). The rich theoretical offerings of the studio allowed me to challenge the status quo of landscape habitation and propose alternative pathways towards transitional territories.

In this graduation project, the process of urban development is taking as the catalyst for

transition accentuating change, uncertainty, and revealing extreme conditions on the landscapes. The rise in constructions and demolitions in the Parisian region demands a fundamental transformation of the riverine environment as a provider of raw materials. The Seine' s riverbanks are therefore violently altered and exploited, and the river significantly modified to accommodate this urban transition. While the notion of extreme, central to the studio, does not relate directly to a climatic situation, it is embodied by the extreme alterations the landscape has undergone and is currently undergoing.

In the spirit of the studio' s perspective, urbanism is explored far beyond the conventional urban boundaries to offer an integrated understanding of landscape dynamics. The field of urbanism is also expanded to integrate multi-disciplinary lenses to fully grasp the context' s problematics: including sociology, political science, landscape ecology, water management, and geology.

Finally, this year' s TT studio focused on 'the Coastal Project: Inland-Seawards' . While this theme was hard to wrap my head around at first considering the project location I had chosen (Paris), my design project - located in an even more upstream alluvial forest on the banks of the Seine River - offered a unique perspective in the group that challenged how far inland we can read a coastline, and how impactful theses interventions can be seawards.

Role of the (Landscape) Urbanist

This graduation year begun with an inspiring talk by Dirk Sijmons who mentioned "the 4 personas" of the Landscape Urbanist: the architect, the research, the activist, and the artist. In this project, I actively seek to merge all four and will look to continue doing so beyond: using the architecture as the medium to communicate and build, the research as the foundational method to uncover problematics, the activism as the stance to which to look at and respond to crisis, and the art as the basis of imagination and creation. The Landscape Urbanist as politician and as economist also came up in our discussions as they represent two important pillars in our society that need to be understood and leveraged towards pragmatic change.

While the 20th century Urbanist might have imposed a design thinking and strategy onto communities, ecosystems, and landscapes, the 21st century spatial practitioner must mediate all voices (from the vulnerable to the powerful) to arrive at a prosperous finality. In that sense, I believe the Landscape Urbanist must become a "creative mediator", a term retrieved from Harriet Harriss, Rory Hyde, and Roberta Marcaccio' s introduction of their collection of essays: *Architects after Architecture* (2021, p.9). This term strongly resonated with me on both a personal and professional level. Spatial designers have the ability to understand space beyond jurisdictions and profit margins, through scales, systems, and processes. We, as active and conscious actors, must embody this role of mediator as to juggle between all fields and bridge gaps "between different forms of knowledge" to offer clear pathways that balance "emotional power and pragmatic potential" (Harriss et al., 2021).

We also have a responsibility as practitioners to understand the systems and practices we are directly or indirectly engage with, whether they be social, cultural, or environmental and, with this consciousness, act and create to remedy to ongoing destructive practices. In this urbanism design project, I take on the responsibility of responding to landscape degradation practices directly associated with our field. This role as mediator and agent of repair is one I will continue to carry with me through my professional endeavors.

Concluding remarks

To conclude, the formulation, development, and delivery of this graduation project have brought on many, many, challenges both personally and academically. This year has tested my resilience, patience, and inherent positive mindset. While expending my theoretical knowledge of the spatial disciplines, developing my communication skills, and further establishing my visual language are all very welcomed (and professionally useful) areas of growth this year, I am particularly proud and surprised of my mental strength and perseverance throughout all the difficulties. Through this project, I was able to surpass the perception of what I was able to do and hope to continue carrying this confidence onwards.

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Sijmons, D. (2020). Transitional Territories Transdisciplinary Lecture Series.

09 DATAGRAPHY

09 DATAGRAPHY

All litterature references can be found at the end of each specific section of the report as to ease the process of looking at sources while reading the text.
All visuals have an accompagnying title indicating the author and the year of the image, diagram, or photograph.

Databases

http://infoterre.brgm.fr/

https://inpn.mnhn.fr/telechargement/cartes-et-information-geographique/ep/aphn

https://opendata.paris.fr/pages/home/

https://opendata.apur.org/

https://data.iledefrance.fr/pages/home-covid/

https://www.geoportail.gouv.fr/

https://www.data.gouv.fr/en/

https://sig.ville.gouv.fr/

https://www.openstreetmap.org/

https://www.infrapedia.com/app

https://fr-fr.topographic-map.com/maps/2mwb/La-Seine/

https://georchestra.archiseine.metis.upmc.fr/geonetwork/srv/fre/catalog.search#/home

https://www.seinegrandslacs.fr/geoseinegrandslacs-linformation-geographique

https://archiseine.metis.upmc.fr/fr/cartes-georeferencees

10 APPENDIX

10 APPENDIX
10.01 THEORETICAL REVIEW

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AR3U022 - Theory of Urbanism
Faculty of Architecture and Built Environment - TU Delft

Transitional Territories Studio
Submission – December 21st 2020

Geographic Urbanism: Capitalism and Political Ecology

A theoretical review toward an alternative model of ecological territorialization

Abstract

This theoretical review looks at the root, processes, and scales of anthropogenic territorial transformations and their social, cultural, and environmental impacts. The anthropocentric appropriation of space, emphasized by a utilitarian approach to the environment, has brought about ontologically reworked landscapes through a process of planetary territorialization. This paper argues that the commodification and capitalization of natural resources – justified by a division between humans and the natural environment – has led to major ecological alterations which have in part caused the multiple crisis we are currently facing. This essay offers an alternative position based on philosophies of Ecological Humanism which promote a more constructive approach to territorial habitation. This position draws connections between the various theoretical fields of Political, Social, and Cultural Ecology to achieve a multi-scalar spatial reappropriate from capital forces while promoting an ecological territorialization.

Key words: Territorialization, Capitalism, Political Ecology, Ecological Humanism.

Introduction

In the 21st century, climatic disturbances, species collapse, and landscape degradation have made the ecological crisis undeniable. Political discourse around ecological transitions and CO_2 emissions regulations is more present today than ever – particularly in European countries, but globally as well, through the signed Paris Agreements of 2015. While governmental ambitions are loosely present in rhetoric – and slowly formulating in legislation, solutions to the multi-dimensional crisis are variable, constituted of many unknowns, and can be directed at various scales of action. In the field of spatial planning and urbanism, ecologically enhancing visions on the *territorial* scale are starting to be developed to resolve certain destructive patterns of inhabitation. Looking at issues at a global scale becomes sometimes necessary to link various vital anthropogenic processes underlined by degrative behaviors. Linking landscapes of extraction, production, and consumption allows spatial designers to highlight and tackle human systems which are driven by capital incentives and result in ecosystem destabilization. In the current globalized economy, connecting processes which are not in physical proximity allows a multiplicity of actors to perceive the dynamics and flows which shape urban lives and, in turn, the world. While not applied to a specific context, this essay will base itself on Western literature, most notably from North America and France.

This essay will strive to theoretically outline how humans have historically appropriated and modified landscapes for anthropocentric purposes through the act of territorialization and how capitalist mindsets have accentuated environmentally destructive tendencies and single-minded agendas. From there, an alternative approach to landscape habitation – backed by theories on Social, Political, and Cultural Ecology - will be discussed offering *hopeful* visions to recalibrate current exploitative activities. Finally, this essay will conclude with actions directed at spatial planners to implement a more

constructive symbiotic relation between man and environment based on principles of *Ecological Humanism*.

Philosophical Divide between Human and Nature

To begin this essay, we must first establish a basis of philosophical wrongdoing which has been driven anthropocentric landscape transformations – with minimal ecological understanding: Cartesian thinking. The French philosopher, Rene Descartes, argued that a separation between humans and their environment allowed for a status of "masters and possessors of nature," to which an application of "rational analysis and technological control" would allow human prosperity (René Descartes as cited by Whiteside, 2002, p.2). Cartesian Dualism has since allowed the geometric reconfiguration of landscapes as a way to promote understanding and allow a particular productivity (Hatfield, 2014). Jacob, one of the driving forces of the French environmental movement of the end of 20th century, has strongly argued that this distinction has influenced spatial perception and led to the creation of the western anthropogenic landscape, one of heavily modified land-use, desynchronized temporal ecological processes, and artifice: a landscape geared towards economic production over all else (Whiteside, 2002 ; Jacob, 1999). This control and transformation of natural environments for human production – that is the transformation of 'natural lands' into crop fields, industrial sites, urban settlements… – has erased fundamental connections between man and the inherent ecology of landscapes. Val Plumwood, an eco-feminist Australian theorist argued that "the disconnect between man and environment, culture and ecology, is one of the philosophical wrongs that have led to the current environmental crisis" (Plumwood as cited in Whiteside, 2002, p.259). She is of course one of many philosophers who have argued in that direction. The Cartesian outlook on nature, as it evolved in correlation to our dominant economic system, created the notion that the landscape was simply a source of matter which could

be moved, transformed, and capitalized at will for anthropocentric development. This separation between man and his environment allowed for the process of environmental colonization and exploitation of resources provided by landscapes. T.J. Demos is one of the fervent cultural scholars which condemns the colonization of nature as an intrinsic reality and calls for a recalibration of power dynamics between man and nature (Demos, 2016).

> *"Decolonizing nature entails transcending human-centered exceptionalism, no longer placing ourselves at the center of the universe and viewing nature as a source of endless bounty" (Demos, 2016, p. 19).*

Territorialization: Anthropocentric Territory

The acts of global environmental colonization have created a singular anthropocentric territory – one that is "distinctive, bounded, measurable, communicable" (Murphy, 2012, p. 164). The notions of territorialization were questioned by French philosopher Gilles Deleuze. In his writings, Deleuze condemns anthropogenic appropriation of landscapes as it facilitated the act of separating matter from its location of formation (de-territorialization) and the act of moving and re-appropriating resources for production in another, more *convenient* location (re-territorialization) (Smith & Protevi, 2018). As James C. Scott states, in the fascinating assemblage of anthropogenic territorial schemes that have failed, *Seeing like a State* (Scott, 1998), *territorialization* is the effect of *territoriality*: strategies which are intended to produce certain effects dictated by the governing state. The creation of these new landscapes was therefore driven by a ruling class to govern people and resources to achieve particular social and economic goals (Murphy, 2012, p. 169). The act of territorialization – done with an anthropocentric mindset - has resulted in the dismantling of key ecological functions. Some of the main results of

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such appropriation of space include alterations to the food chain , artificialization of soils, chemically altered vegetation cycles, modified hydrological systems…

Result: Planetary Urbanization

The spread of human influence on the landscape has led us to our current state of *planetary urbanism* - establishing the global scale of human modifications on global dynamics. Henri Lefebvre was the first theorist to proclaim the full extent to which humans had urbanized society and altered ecological processes (Lefebvre, 2013). Various authors have subsequently re-iterated and furthered the discourse around this notion including David Harvey and Neil Brenner. The comprehension that man had modified the Earth to his *urban* desires highlights the fundamental imposition of human systems (social, economic, political, and cultural) onto the functioning of landscapes with little considerations on the loss of ecological benefits. Brenner and Schmid have outlined four key theoretical arguments to prove this planetary urbanization; two of which seem of particular importance to state. (1) First, the understanding that most lands have been *functionalized*, therefore altered to provide a specific benefit to urban society. (2) Second, that all lands historically deemed as "wilderness" have been reached with repercussions from urbanization process. For example, the authors suppose that all land have been meet with particles of air pollution steaming from urban habitation (Brenner & Schmid, 2012). These two points highlight the appropriation of landscapes as generator of resources geared towards human productivity.

> *"Resource-making activities are fundamentally matters of territorialization – the expression of social power in a geographical form" (Bridge, 2010, p. 825).*

Planetary urbanization emphasizes the scale of environmental colonization and establishment of a global human territory – one that is governed by a dominant political and economic system. The transformations applied on the functioning of landscapes can be deemed industrious in many ways as they have allowed for the exponential establishment of humanity. But they become problematic due to their scale, uncontrollable growth, and fossil-based energy source. When understanding the economic drivers, political agendas, and subsequent socio-ecological inequalities which have resulted from this environmental colonization, it can be said that planetary urbanization has been driven by destructive single-minded forces operating toward economic profit as oppose to prosperity.

Economic Territorialization as a Driver: Capitalism and Resources

Many theorists in the realm of social and environmental justice point out that the capitalist economic lens applied to the territory is the inherent flaw in spatial modification. This system is inherently exploitative of resources and populations. It disregards bi-lateral and peripheral benefits, which typically enhances the primary resources which are being capitalized on. Short-term profit is seen as a greater incentive then long-term production and regeneration. In their book, *Anti-Oedipus*, Gilles Deleuze and Félix Guattari state that capitalism has enabled a "radical decoding" of material flows – counter acting against greater powers which had originally formulated them (Smith & Protevi, 2018). Similarly to the act of de-territorialization, capitalistic re-territorialization has the byproduct of creating enormous inequality gaps benefiting the few and affecting the many (Sibertin-Blanc, 2010).

A branch of Marxist political theorist has coined the term *metabolic rift* to describe the social division between city and countryside, center and periphery, urban and rural. This division offered the possibility for governing states (political and economic) to apply dominance on landscapes and deemed a fervent contributor to environmental degradation

(Foster as cited by Barca & Bridge, 2015). This notion of the metabolic rift has been used by critical theories to understand how "spatial differentiation" allowed capitalism to encroach on ecological functioning (Barca & Bridge, 2015).

Various spatial practitioners and academics have deconstructed resource dynamics in order to highlight actors of landscape exploitation: the benefactors and the most affected (i.e.: the most vulnerable). Matthew Gandy, in his book, Concrete and Clay: Reworking Nature in New York City (2002) corelates the evolution of the City of New York through the lens of territorial dominance and resource extraction in the Hudson Valley – hundreds of kilometers away from the city. He calls out a *capitalistic urbanism* that looks not only at taming but redirecting resources towards spaces of capital production, i.e. urban spaces. In his book, the author highlights that infrastructure and amenity creations in the name of public access was always juxtaposed with a private agenda geared at capital accumulation (Gandy, 2002). While some might believe that investing into free and public access to drinking water for example originates from an act of equity and justice, Gandy states that those actions were only done to sustain capital production in the industrial city, dependent on a healthy working class (Gandy, 2002). This idea is demonstrated in relations to water infrastructure, mobility infrastructure, and various other amenities in the city. This peered-reviewed book has been coined as one of the first to establish these intricate links between urban space, landscape resources, and capital production.

The act of anthropocentric territorialization driven by the capitalization of landscape resources, although allowing for the development of urban centers, has triggered vast socio-economic inequalities, and created a disconnect between production and consumption. The source of materials is unknown to the consumer in urban space. This invisible process has allowed for the depletion of resources which has triggered an ecological collapse due to transformations in surface and subsurface dynamics. Capitalism can be said to have fundamentally altered ecosystems. While dependent on water, energy,

and materials, cities are based on an exploitative practice which disregards private incentives for resource manipulation.

An Alternative Philosophy: Ecological Humanism

To offer an alternative to the destructive tendencies of capital urbanism and the division of anthropogenic and nature systems, various – sometimes utopic – theorists have argued for a philosophy that integrate pillars of ecological thinking into human rational, leading to the branch of thinking coined *Ecological Humanism*. This movement concerns itself with a realignment of human productivity with ecological capacities and believes in the capabilities of human beings to transform their societies to enhance and let flourish both humanity and nature (Morris, 2017). This branch of philosophical thinking has brought about theories on political, cultural, and social ecology to create constructive bi-lateral relationship and provide guiding ideals toward a more sustainable human habitation of the Earth. Authors such as Whiteside (2002) have argued to surpass the division made between anthropocentric and non-anthropocentric discourse, common in North American academia, to promote and achieve a non-biased conciliation of systems – one that will project towards new synergies in human ecology (Whiteside, 2002).

> *"Face up to the fact that survival in the Anthropocene requires radical social change, replacing fossil capitalism with an ecological civilization, eco-socialism" (Angus, 2016, p.20).*

Gilles Clément, a French landscape designer and theorist, outlined his approach to Ecological Humanism in his book *"The Planetary Garden" and Other Writings* (2015). Clement underlines humanity's dependence on biological and non-biological

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heterogeneity and calls for an ecological management of natural resources. The author believes that symbiotic humanism can be achieve by cultivating Earth like a garden, allowing diversity and regeneration to occur as to not deplete resources and cause further unbalance (Clement, 2015). This philosophy focuses on a culture that integrates human beings with the natural systems that allowed them to evolve. While some believe that humans have surpassed their ecological thresholds some optimist theorists believe in a possible recalibration in power dynamics. For such restructuring, a global political coordination would be needed – supported by renewed social and cultural pillars which integrate ecological rational in anthropogenic development.

From Social Ecology

Within the umbrella of Ecological Humanism, academics have development theories which range from radical to incremental visions related to space, society, politics, and ecology; all have concentrated on an effort to surpass exploitative behaviors and anthropocentric spatial appropriation. Authors such as Murray Bookchin and Dan Chodorkoff have been leading figures in the Ecological Humanism philosophical movement (Morris, 2017). Bookchin was the first thinker to coin the notion of *Social Ecology* in the 1960s. His proposition looked at a reconstructive vision of human to nature relationship by harvesting ecological knowledge as a pillar of a more communitarian societal approach (Venturini et al., 2019). His theory, criticized at times for its radical approach, allowed the formulation of propositions toward an alternative system that would rely on ecological concepts and characteristics to structure social practices. Described by Whiteside (2002), Bookchin's principles relied on "equality, not hierarchy; differentiation, not uniformity; cooperation, not competition" and emphasized self-regulation by "decentralizing processes of dynamic interaction" (Bookchin as cited by Whiteside, 2002, p.275). His neo-anarchist approach to governance brought along much stigma on his writings, but the

fundaments of his thinking and ideals have recently resurfaced to address alternative to environmentally degrading human development. The revival of Bookchin's thinking in the recently published book, *Social Ecology and the Right to the City : Towards Ecological and Democratic Cities (2019)* highlights pragmatic approaches to the theorist's utopic vision of the 1960s which links social issues to environmental urgencies leading to a formulation of just governance practices to respond to the intertwined socio-environmental injustices (Venturini et al., 2019).

> *"Social ecology understands the relationship between ecological and human exploitation and aims to assess and solve the current social and environmental crises, conceived as the direct consequences of capitalism and all forms of domination" (Venturini et al., 2019, p. 13).*

Toward Political Ecology

Political Ecology is a field that seeks to unravel the political forces at work in environmental access, management, and landscape transformations" (Robbins, 2012, p.15). In his book, Paul Robbins (2012) offers a critical viewpoint on Political Ecology and strives to demonstrate the way in which politics are inevitably ecological, and ecology is inherently political. In a similar effort to Social Ecology, theories of Political Ecology forge links between social and environmental justice challenges with a specific angle on the governance structures of urban territories. The body of theories begun in the 1970s and 1980s, at the height of the first American environmental movement – most notably focused on the "struggles over justice in rural land and natural resource management as they related to colonization and immigration" (Bridge, 2015, p 590). While there are many subcategories to the general study that is Political Ecology, authors have, in recent years,

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multiplied perspectives to uncover the deep impacts of human development on the global ecological structure through the dominance of anthropocentric systems. Political Ecology has gained much popularity in the 21st to support viable alternative governance structures to respond to growing socio-economic inequalities, patterns of environmental degradation, rapid depletion of natural resources, and deterioration of ecosystem performance. French scholars have largely contributed to this field of study but have been wildly under-represented in Anglo-Saxon discourse (Whiteside, 2002).

> *"Political Ecology recognizes that the ways we regard nature carry deep implications and often unacknowledged ramifications for how we organize society, assign responsibility for environmental change, and assess social impact" (Demos, 2016, p.16).*

Political urban ecology is a branch of the field, largely inspired by Henri Lefebvre's writing on *The Right to the City*, highlighting the undeniable forces of discrimination which act against, discriminate, and displaces the most vulnerable in urban spaces (Venturini et al., 2019). While the French philosopher dedicated much of his writings to social urban struggles, many theorists have since applied his thinking to ecological problematics. Principles of spatial justice have been related to environmental landscapes and spaces of production outside of city boundaries to theorize on co-constructive exchanges and collaborative management of space (Sack, 1986 ; Harvey, 2008 ; Bridge, 2015). David Harvey, a driving theorist in the fields of social justice, urban resistance, and political ecology has long promoted the theory of *collaborative development* seeking to recalibrate uneven power dynamics between ruling and working classes – this theory has been formulated as well regarding spaces of production and consumption. This idea sanctions agenda-driven decision makers and strives to empower individuals to assert a change in

the spaces they live in and live from. Harvey argues that the possibility for change is more of a "common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization" (Harvey, 2008 : 25).

Political Ecology allows to highlight governance dynamics which have asserted dominance on space and provoked ecological modifications. Applied to resources and landscape transformations, Political Ecology, offers an engagement of governance with communities and ecosystem connecting human and non-human actors in a conscious co-management of space (Latour as cited by Whiteside, 2002). A multi-interactive system of Political Ecology coupling anthropocentric and ecological systems is deemed indispensable in our age of ecological collapse (see Figure 1, Zimmerer, 2015). The theories featured in Political Ecology thinking therefore have a role to play in "one of the most existential and political environmental issues of our time – with serious implications for global geographies, social and environmental justice" (Liverman, 2015).

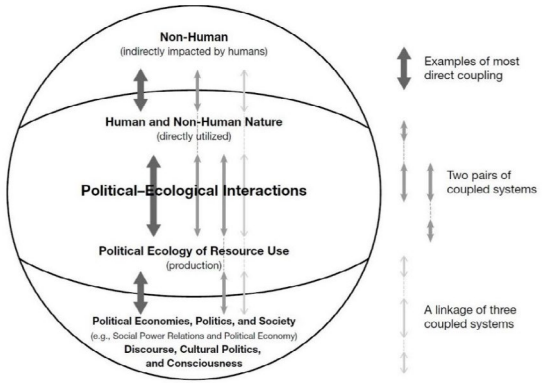

Figure 11.1 Diagram of general political-ecological integration based on coupled factors

Figure 1: Diagram of Political Ecological Interactions – (Zimmerer, 2015, p. 156)

Spatial Reappropriation: Geographic Urbanism

Finally, to relate the previously mentioned theoretical rhetoric to the *spaces* it has created, and it can create, conciliating the process of urban development with territorial ecological dynamics is primordial. Brenner and Schmid, in their study on Planetary Urbanism, stated that spatial practitioners must act with a "foundational reconceptualization" of urbanization processes considering the global socio-spatial and ecological dynamics unfolding (Brenner & Schmid, 2012). Urban and landscape academics and practitioners such as Reed and Lister, Waldheim, Belanger, and others, dive into the notions of *Geographic Urbanism* and *Landscape Urbanism* - relating urban construct to geographic realities, most notably confronting hydrology and geomorphology to resources, infrastructures, and settlements. The *ecogeographical logic* has emerged in order to reconceptualize space as a geographical continuity – breaking up anthropogenic barriers which have been set up by layers of governmental and economic spatial appropriations (Barca & Bridge, 2015). These tools of spatial re-conception allow for the implementation of renewed symbiotic systems which apply a critical lens on normative patterns of territorial occupation.

Pierre Belanger is one of the most notable theorists and spatial practitioners that have focused his research on ecology and landscape infrastructures. He argues that there has been a growing shift in appropriation of infrastructure design projects, which were once driven by civil engineers and financial corporations and is since being reclaimed by urban and landscape architects (Belanger, the New Geographic Landscape). This shift signifies a turning point in how resources could be extracted, moved, altered, and used – as environmental-conscious actors look to get involve in establishing the driving arteries of human development. Belanger, in a 2020 audio-visual testimony, highlighted the power of the landscape as a form of resistance towards socio-economic and cultural injustices, and

against oppressive forms of governance (Belanger, 2020). Gilles Clement also believes in the possibility for landscapes to serve as an act of resistance offering possibilities of eco-reappropriation of spaces once claimed by capital dynamics. In his writing, Clement outlines the 7 points of what he names "gardens of resistance" where acts of extractions are balanced with preservation and organic cycles of growth are favored over enforced order (Clement, 2015).

The act of spatial re-appropriation, although intended as physical intervention, first and foremost, is made through the act of mapping. Mapping is an indispensable tool used to shape understandings of nature, differences, and spatial justice. It can be served to expose claims on resources and destructive processes powered by specific governing actors. Some political ecologist and cartographers have theorized on notions of *participatory-mapping* and *counter-mapping* which would allow for a spatial re-conception and a non-economic claim to the land (Bryan, 2015). Mapping here is implied as an act of collaborative identity formation around spaces that are shared amongst communities and ecosystems. It is through this visual re-appropriation that the first step can be made towards physical change in landscapes to recalibrate dynamics and achieve socio-cultural and ecological symbiotic balance.

Conclusion

In summary, this theoretical review begins by outlining the territorialization processes and the capital forces which have been deployed at the global scale in order to governor and commodify the landscape. This anthropocentric dominance has been argued to be destructive and exploitative of environments and communities provoking severe inequalities, cultural disconnects between people and natural processes, and irreversible changes on ecological systems. This essay positions itself towards a fundamental re-conception of space and power to allow for a renew and symbiotic spatial dialogue

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between man and nature. This radical shift is supported by philosophies which strive to guide such thoughts and change and looks forwards toward a deterritorialization and perhaps an ecological re-territorialization, where human activities enhance ecological processes. In the age of the ecological crisis we are facing, this sense of ownership and anthropocentric perception of space can no longer continue. The possibilities for landscape architect, planners, and urbanist are endless in exposing not only the current process of capital production through environmental process but projecting alternatives. Governmental ambitions drive initial and normative landscape occupation and the primary infrastructure backbones which shape urban spaces. When influenced by financial incentives as oppose to ecological functions, detrimental effects occur in the by-production of benefits. By offering a shift of perspective and multi-collaborative participation, a shift of management with inherently ecological and social values would allow for possibilities of landscape ecology retributions. Only by relating back to earthly processes will we be able to surpass the forces which have led us to our state of ecological crisis.

Finally, while some tools such as counter-mapping were briefly evoked by the end of the essay, an overview of concrete spatial and governance tools would need to be elaborated further to offer insights on design strategies for ecological spatial reappropriation and to go further in the application of political ecology in space.

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10 APPENDIX
10.02 GRADUATION PLAN

GRADUATION PLAN

GRADUATION STUDIO

Name: Transitional Territories, 2020-21

Theme: The Trans-coastal Project: In Land, Sea Wards

First Mentor: Luisa Calabrese, Urban Design

Second Mentor: Joep Storms, Geology

Choice of Studio: I was first motivated to join the Transitional Territories Studio by looking at previous student works, which truly sparked inspiration and innovation. The studio's emphasis on the scale of the territorial: looking at the landscape, beyond land-use boundaries, as a fluid connector of vital living and non-living actors and processes is of great interest to me. The project I proposed and have since been working toward, was interested in breaking conventionalities and linking urban development processes (the construction of the urban project) with territorial dynamics (the territorial project). The studio is also interested in applying a critical perspective to current planetary processes which was reinforced by fascinating theoretical and conceptual understandings of the landscape brought forth by the Transitional Territories mentors and the lecture series. This has, over time, continued to affirm my choice for this studio. As a final addition, the collaboration of the TT studio with the AA Diploma Unit 9 was particularly pertinent for me due to an investigative and forensic pedagogic approach to the field of urbanism and landscape architecture.

GRADUATION PROJECT

Title: From Matter to Urban Politics: Confronting the Seine River Basin to the Grand Paris Urban Project. Toward Reparative Ecologies in the Riverine Territory.

Location: The Grand Paris and the Seine River Basin

Problem Statement: Paris is currently experiencing the largest urban re-development in Europe. This urban project is not only modifying the relationship between the center and periphery of the city but has large implications beyond the urban and into the territorial - particularly the riverine territory of the Seine. This urbanization process is affecting landscape dynamics, material movement, ecological cycles all along the Seine River Basin. The notion, effects, and repercussions of the anthropocentric territory will be questioned as it significantly alters ecologies and depletes environments of natural resources following political decisions towards unilateral economic growth.

Research Question: How can urban development in the Grand Paris become a catalyst toward reparative geo-morphologic, ecological, and fluvial landscapes in the Seine River Basin?

Design Assignment: The Design assignment is divided into three parts. First, a critical cartography atlas which builds an intertwined narrative between the Grand Paris and the Seine River Basin. This Atlas follows the 4 lines of inquiry of the Transitional Territories Studio: Matter, Topos, Habitat, and Geopolitics. Second, a forensic exploration of urban matter associated to the current urban transition process will be performed – this will allow to spatially follow matter through economic and political decision frameworks. Finally, a reparative vision of the territorial will be proposed, using the anthropogenic matter as the basis of the landscape. This vision will create co-temporalities between geological and political time frames and provide a co-constructive approach to building the urban project.

PROCESS

Method Description: This project will be based off a diligent literature review which began around broad theories and with time has focused on context specific and subject specific insights. Multi-axis analyses are performed under the framework of the critical zone (from the geological substrate to the atmospheric processes) and the transect (from the source to the coast). Finally, cartography, photography and drawing are the main visual tools used to represent the findings and propose alternatives and interventions.

Literature and general practical preferences: The literature read for this project range in specificity and subject matter: from broad understanding of the field of Landscape Urbanism and Ecology - Waldheim (2016) and Belanger (2014) – to specific subject focused literature – Gandy (2002) and Whiteside (2002). The literature also ranges in thematic focus: from planetary environmental studies – Latour (2020) and Brenner & Schmid (2012) - to political and sociological discourse – Harvey (2012) and Demos (2016). Moreover, mainstream media and current events have feed into the project's narrative to reinforce its societal relevance.

REFLECTION

What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (Urbanism), and your master program (MSc AUBS)?

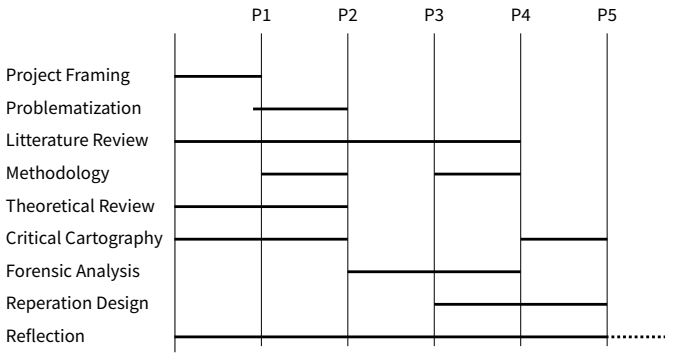
My research project looks at exposing and redefining the urban project as a territorial project. In the spirit of the studio's perspective, urbanism is explored far beyond the conventional urban boundaries to offer an integrated understanding of landscape dynamics. The analysis performed in this project looks to uncover processes related to the current wave of urbanization occurring in the Seine River Basin's Critical Zone. This relational outlook creates links between the urban and territorial, society and environment, land and water, and culture and matter. The field of urbanism is also expanded here to integrate multi-disciplinary lenses to fully grasp the context's problematics: including sociology, political science, landscape ecology, and geology.

What is the relevance of your graduation work in the larger social, professional, and scientific framework?

First and foremost, the Parisian Region is the most populated and one of the most influential urban regions in Europe. The city is the site of the internationally signed climate-agreement, the COP21, which symbolized a paradigm shift back in 2015 underlining environmental ambitions at a planetary scale. Since the agreements, while global emissions have remained stagnant if not increased (disregarding the Covid-19 impacts on society, which are still too recent to exemplify an actual long-lasting shift), local ambitions in the city have increased with hopes to minimize ecological imprints and recalibrate urban environments and ecologies.

This research project looks to add to the continued effort to envision innovative ways to propel the Parisian Urban region into a new era of urban living. It follows the current large-scale urban transition occurring in Paris, a transition that is redefining city limits, establishing new socio-spatial urban relationships, and projecting the urban region in the 21st Century. The temporal relevance of this project is highlighted by this ongoing redevelopment project - that although set in motion less than a decade ago - is expected to last for at least another decade and leave long lasting effects on the city's fabric, identity, and eco-system.

This project is based on the Transitional Territories vision of understanding the urban project through the territorial scale. Here, the project looks at decomposing the processes of urban development and linking it to landscapes of externalities that reach far beyond conventional city boundaries. This project explores the possibility for a co-constructive relationship between urban dynamics and fluvial, ecological, and geo-morphologic functioning. This correlation of processes is essential as we face an ongoing climate crisis that is largely caused by anthropocentric pressures stemming from urbanization processes.



Research Schedule
made by author (2021)

From Matter to Urban Politics:
Confronting the Grand Paris Urban Project to the Seine River Basin

Hadrien Cassan

Transitional Territories
2020-21