

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto:Examencommissie-BK@tudelft.nl)), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	James Allan MacDonald-Nelson
Student number	4773853
Telephone number	
Private e-mail address	

Studio		
Name / Theme	EMU Post-Master in Urbanism Graduation Project	
Main mentor	Birgit Hausleitner (First mentor);	Urban Design
Second mentor	Steffen Nijhuis	Landscape Architecture
External Mentor	Alvise Pagnacco	
Argumentation of choice of the studio	[not applicable]	

Graduation project	
Title of the graduation project	Planning for Uncertainty: Strategies to Address Climate Change and in the context of Agriculture and Urban Development in the Lower Mainland of British Columbia, Canada
Goal	
Location:	Lower Mainland, British Columbia, Canada
The posed problem,	<p>Since the 1970s, the Lower Mainland of British Columbia has experienced some of the highest population growth rates in North America. While there are clear distinctions between city centres, suburban sprawl, agriculture and natural areas, the region can be largely considered urban, productive and industrialized.</p> <p>A recent government initiative to establish the Fraser Valley Innovation Corridor within the Lower Mainland, compounded with predicted risks related to sea level rise, fluvial flooding and drought, calls for an innovative, climate adaptive approach to the spatial and functional organization of agriculture and development in the Lower Mainland.</p>
research questions and	In the context of climate change and urban development, what does an alternative way to design, plan and improve the adaptive capacity of agriculture in the Lower Mainland look like?

design assignment in which these result.	A local spatial/functional strategy for a section of the proposed Fraser Valley Innovation Corridor. Principles will be derived from this design proposal to demonstrate how to integrate agriculture and development into a larger, regional-scale climate adaptive plan.
<p>[This should be formulated in such a way that the graduation project can answer these questions. The definition of the problem has to be significant to a clearly defined area of research and design.]</p>	
<b>Process</b>	
<b>Method description</b>	
<p>First, an analysis involving a '3x3x3' methodology is completed by looking at the Lower Mainland during three time periods (1876, 1949 and 2020), three scales (regional, city and local) and three spatial layers (occupation, infrastructure and nature). In doing so, the intent is to gain a fuller understanding of the spatial and functional elements found within the Lower Mainland on the large scale and identify how land use at the city and local scale accommodates both inhabitants and agricultural activities. At the scale of the region, a risk analysis related to fluvial flooding and sea level rise is conducted to identify areas that are most at risk within the region.</p> <p>At each of the smaller scales, a typological assessment is done to understand the spatial organization of agricultural operations and of urban structures at a city scale. Understanding this spatial structure also allows for an assessment of the processes it supports (ie. Food production, processing, and distribution). In addition, a relational assessment of these typologies to the urban region (*considering the three layers- occupation, infrastructure and nature)</p> <p>A literature review was completed to understand the concept of 'agrarian urbanism' (Waldheim, 2010) and it's roots in the garden city movement.</p> <p>From this a more detailed analysis explores the current trends (regarding agricultural production and distribution, current and proposed employment hubs, residential development pressure, and climate change risk) that are shaping the future of the Lower Mainland. These are used to understand which are the areas of conflict and opportunity and what are the conditions for spatial development</p> <p>From this point, a particular area (at the municipal boundaries between Surrey and Langley Township) is used to explore the possibilities for spatial and functional transformation on a smaller scale. Principles derived from this design exercise will help to establish a larger framework for the entire Lower Mainland.</p>	

## Literature and general practical preference

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- Boswell, M. R., Greve, A. I., Seale, T. L., Boswell, M. R., Greve, A. I., & Seale, T. L. (2012). Climate Change Adaptation Strategies. *Local Climate Action Planning*, 153–182. [https://doi.org/10.5822/978-1-61091-201-3\\_6](https://doi.org/10.5822/978-1-61091-201-3_6)
- Curry, C. L., & Zwiers, F. W. (2018). Examining controls on peak annual streamflow and floods in the Fraser River Basin of British Columbia. *Hydrology and Earth System Sciences*, 22(4), 2285–2309. <https://doi.org/10.5194/hess-22-2285-2018>
- Fujita, M. (2010). The evolution of spatial economics: From Thünen to the new economic geography. *Japanese Economic Review*, 61(1), 1–32. <https://doi.org/10.1111/j.1468-5876.2009.00504.x>
- Kostrowicki, J. (1977). Agricultural typology concept and method. *Agricultural Systems*, 2(1), 33–45. [https://doi.org/10.1016/0308-521X\(77\)90015-4](https://doi.org/10.1016/0308-521X(77)90015-4)
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- Waldheim, C. (2013). Notes toward a history of agrarian urbanism. *Sustaining Cities: Urban Policies, Practices, and Perceptions*, 63–75.

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CCA. (2019). *Canada's top climate change risks: the expert panel on climate change risks and adaptation potential*. <https://cca-reports.ca/wp-content/uploads/2019/07/Report-Canada-top-climate-change-risks.pdf>

McMillan, T., Causley, D., Hanna, K., Lulham, N., Seasons, M., & Boddy, S. (2019). *Local adaptation in Canada: Survey report*. June, 16. <http://ok-ccar.sites.olt.ubc.ca/files/2019/06/Local-Adaptation-in-Canada-Full-web.-1.pdf>

## Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

Understanding large metropolitan regions and how they function, transform and respond to changes in the environment and the economy is a complex task to begin with. When it comes to providing answers concerning how to guide the management and development of these regions, the task becomes that much more complicated. Looking at the Lower Mainland of British Columbia and its regional structure and organization is directly linked to the work I have partaken in while pursuing the MSc European Post-Masters in Urbanism at TU Delft. The program has consistently focused on the study of large metropolitan regions or areas and asked us to analyse and interpret these study areas by producing maps, evaluating risk, and looking at trends for the future. I will use these skills and experience from the last 3 semesters in order to carry out a thesis project that works at a similar scale in a region in Canada.

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

This thesis project aims to not only understand urban regions for only their urban elements, but to explore how agricultural production (in the case of the Lower Mainland in British Columbia) is intertwined with and part of a much larger urban region. Unfortunately, this delta region will also face extreme risks in the future given the effects of climate change. For this reason, alternative land management principles and local design strategies need to work in tandem and across scales in order to create climate adapted regions. This is one of the most pressing issues of our time, to work towards creating sustainable, adapted urban regions where people can continue to live and thrive. This is a crucial topic for Canada and especially the Lower Mainland as it is one of the country's most prosperous and agriculturally productive regions and it provides a vital corridor for trade with the

rest of the world. Safeguarding this part of Canada against disaster while improving its self-reliance and sustainability should not only be a concern for people who live in British Columbia, but for the entire nation.