Appendix

I. Manning's coefficient

For the roughness coefficient of the floodplains and the channels the Manning's coefficient is used. Several desing values for the coefficient have been examined. In the book '*Hydrologic analysis and design*' from McCuen, 2005 the table here below gives the most extensive desing values for the Manning range.

	Manning *n* Range[b]
I. Unlined open channels[c]	
A. Earth, uniform section	
1. Clean, recently completed	0.016–0.018
2. Clean, after weathering	0.018–0.020
3. With short grass, few weeds	0.022–0.027
4. In graveled soil, uniform section, clean	0.022–0.025
B. Earth, fairly uniform section	
1. No vegetation	0.022–0.025
2. Grass, some weeds	0.025–0.030
3. Dense weeds or aquatic plants in deep channels	0.030–0.035
4. Sides, clean gravel bottom	0.025–0.030
5. Sides, clean, cobble bottom	0.030–0.040
C. Dragline excavated or dredged	
1. No vegetation	0.028–0.033
2. Light brush on banks	0.035–0.050
D. Rock	
1. Based on design section	0.035
2. Based on actual mean section	
a. Smooth and uniform	0.035–0.040
b. Jagged and irregular	0.040–0.045
E. Channels not maintained, weeds and brush uncut	
1. Dense weeds, high as flow depth	0.08–0.12
2. Clean bottom, brush on sides	0.05–0.08
3. Clean bottom, brush on sides, highest stage of flow	0.07–0.11
4. Dense brush, high-stage	0.10–0.14
II. Roadside channels and swales with maintained vegetation[d,e] (values shown are for velocities of 2 and 6 ft/sec):	
A. Depth of flow up to 0.7 ft	
1. Bermuda grass, Kentucky bluegrass, buffalo grass	
a. Mowed to 2 in.	0.07–0.045
b. Length 4 to 6 in.	0.09–0.05
2. Good stand, any grass	
a. Length about 12 in.	0.18–0.09
b. Length about 24 in.	0.30–0.15
3. Fair stand, any grass	
a. Length about 12 in.	0.14–0.08
b. Length about 24 in.	0.25–0.13

[a]Estimates are by Bureau of Public Roads unless otherwise noted and are for straight alignment. A small increase in value of *n* may be made for channel alignment other than straight.

[b]Ranges of section I are for good to fair construction. For poor-quality construction, use larger values of *n*.

[c]For important work and where accurate determination of water profiles is necessary, the designer is urged to consult the following references and to select *n* by comparison of the specific conditions with the channels tested: *Flow of Water in Irrigation and Similar Canals*, by F.C. Scobey, U.S. Department of Agriculture, Technical Bulletin 652, February 1939 and *Flow of Water in Drainage Channels*, by C.E. Ramser, U.S. Department of Agriculture, Technical Bulletin 129, November 1929.

[d]*Handbook of Channel Design for Soil and Water Conservation*, prepared by the Stillwater Outdoor Hydraulic Laboratory in cooperation with the Oklahoma Agricultural Experiment Station, published by the Soil Conservation Service, U.S. Department of Agriculture, Publ. SCS-TP-61, March 1947, rev. June 1954.

[e]*Flow of Water in Channels Protected by Vegetative Linings*, W.O. Ree and V.J. Palmer, Division of Drainage and Water Control Research, Soil Conservation Service, U.S. Dept. of Agriculture Tech. Bull. 967, February, 1949.

II. Real river values

In chapter 4, the ratio term between the forcing term and the channel characteristics term showed a better insight in the type of river area. These tables are the ratio terms for real rivers, derived from the forcing term and the channel characteristics term.

River	Meuse		
Location	Venlo - Nijmegen		
Source	paper by Spaargaren, 2002		
	Minimum	Maximum	Mean
Qtot	1200	2000	1600
Bc	80	150	115
nc	0.03	0.05	0.04
zb	7.5	12	9.75
Rc	6.3	10.3	8.3
ib	7E-05	2E-04	1E-04
1e term	1.7E+07	1.0E+07	1.2E+07
2e term	6.8E+04	1.7E+05	1.2E+05
ratio	251	59	103

River	Rhine		
Location	Middle Rhine: Bingen-Bonn		
Source	Wikipedia		
	Minimum	Maximum	Mean
Qtot	2000	16000	9000
Bc	300	400	350
nc	0.03	0.05	0.04
zb	7.5	20	13.75
Rc	7.1	18.2	12.7
ib	1E-03	2E-03	1E-03
1e term	1.6E+06	8.8E+06	6.3E+06
2e term	2.8E+05	1.1E+06	6.6E+05
ratio	6	8	10

River	Nile		
Location	Aswan-Edfou		
Source	www.aldokkan.com/geography/nile.htm		
	Minimum	Maximum	Mean
Qtot	3000	10000	6500
Bc	350	2800	1575
nc	0.03	0.05	0.04
zb	30	8	11
Rc	25.6	8.0	10.8
ib	8E-05	1E-04	7E-05
1e term	3.9E+07	1.0E+08	9.7E+07
2e term	3.0E+06	1.8E+06	2.1E+06
ratio	13	57	45

River	Chao Phraya		
Location	Nakhon Sawan - Bangkok		
Source	Wikipedia		
	Minimum	Maximum	Mean
Qtot	2300	6500	4400
Bc	200	1200	700
nc	0,03	0,05	0,04
zb	5	20	12,5
Rc	4,8	19,4	12,1
ib	6,7E-04	6,7E-05	3,7E-05
1e term	3,4E+07	9,7E+07	6,5E+07
2e term	9,4E+04	3,5E+06	8,3E+06
ratio	363	43	77

III. Conditions of the simulations for 2D schematization

Table IIIII-1 The conditions in which the simulations for the tests differ from each other. In tests 3 and 4 the parameter B_c is taken as an example for the other three parameters

	Case	Boundary conditions		Delay in boundaries		Slope perpendicular direction of channel	Parameters				Type of class
		Upstream	Downstream	Up	Down		B_c	n_c	z_b	n_f	C/DA
Test **1**		Q[m/s^3]	h[m]	t_Q	t_h	[-]	min./max				
1-1	A	Constant	0	0	0	no	min.	min.	min.	min.	C
1-1	B	Triangle	0	0	0	no	min.	min.	min.	min.	C
1-1	C	Parabolic	0	0	0	no	min.	min.	min.	min.	C
1-2	A	Constant	Constant	0	0	no	min.	min.	min.	min.	C
1-2	B	Constant	Tide	0	0	no	min.	min.	min.	min.	C
1-2	C	Constant	Storm surge	0	0	no	min.	min.	min.	min.	C
1-2	D	Constant	Storm surge+tide	0	0	no	min.	min.	min.	min.	C
1-3	A	Parabolic	Storm surge+tide	0	0	no	min.	min.	min.	min.	C
1-3	B	Parabolic	Storm surge+tide	26	0	no	min.	min.	min.	min.	C
1-3	C	Parabolic	Storm surge+tide	0	26	no	min.	min.	min.	min.	C
1-3	D	Parabolic	Storm surge+tide	26	26	no	min.	min.	min.	min.	C
Test **2**											
2-1	A	Constant	0	0	0	yes	min.	min.	min.	min.	C
2-1	B	Triangle	0	0	0	yes	min.	min.	min.	min.	C
2-1	C	Parabolic	0	0	0	yes	min.	min.	min.	min.	C
2-2	A	Constant	Constant	0	0	yes	min.	min.	min.	min.	C
2-2	B	Constant	Tide	0	0	yes	min.	min.	min.	min.	C
2-2	C	Constant	Storm surge	0	0	yes	min.	min.	min.	min.	C
2-2	D	Constant	Storm surge+tide	0	0	yes	min.	min.	min.	min.	C
2-3	A	Parabolic	Storm surge+tide	0	0	yes	min.	min.	min.	min.	C
2-3	B	Parabolic	Storm surge+tide	26	0	yes	min.	min.	min.	min.	C
2-3	C	Parabolic	Storm surge+tide	0	26	yes	min.	min.	min.	min.	C
2-3	D	Parabolic	Storm surge+tide	26	26	yes	min.	min.	min.	min.	C
Test 3-1											
3-1-1	A	Constant	0	0	0	no	max.	min.	min.	min.	C
3-1-1	B	Triangle	0	0	0	no	max.	min.	min.	min.	C
3-1-1	C	Parabolic	0	0	0	no	max.	min.	min.	min.	C
3-1-2	A	Constant	Constant	0	0	no	max.	min.	min.	min.	C
3-1-2	B	Constant	Tide	0	0	no	max.	min.	min.	min.	C
3-1-2	C	Constant	Storm surge	0	0	no	max.	min.	min.	min.	C
3-1-2	D	Constant	Storm surge+tide	0	0	no	max.	min.	min.	min.	C
3-1-3	A	Parabolic	Storm surge+tide	0	0	no	max.	min.	min.	min.	C
3-1-3	B	Parabolic	Storm surge+tide	26	0	no	max.	min.	min.	min.	C
3-1-3	C	Parabolic	Storm surge+tide	0	26	no	max.	min.	min.	min.	C
3-1-3	D	Parabolic	Storm surge+tide	26	26	no	max.	min.	min.	min.	C
Test 3-2											
3-2-1	A	Constant	0	0	0	yes	max.	min.	min.	min.	C
3-2-1	B	Triangle	0	0	0	yes	max.	min.	min.	min.	C
3-2-1	C	Parabolic	0	0	0	yes	max.	min.	min.	min.	C
3-2-2	A	Constant	Constant	0	0	yes	max.	min.	min.	min.	C
3-2-2	B	Constant	Tide	0	0	yes	max.	min.	min.	min.	C
3-2-2	C	Constant	Storm surge	0	0	yes	max.	min.	min.	min.	C
3-2-2	D	Constant	Storm surge+tide	0	0	yes	max.	min.	min.	min.	C
3-2-3	A	Parabolic	Storm surge+tide	0	0	yes	max.	min.	min.	min.	C
3-2-3	B	Parabolic	Storm surge+tide	26	0	yes	max.	min.	min.	min.	C
3-2-3	C	Parabolic	Storm surge+tide	0	26	yes	max.	min.	min.	min.	C
3-2-3	D	Parabolic	Storm surge+tide	26	26	yes	max.	min.	min.	min.	C
Test **1**											
1-1	A	Constant	0	0	0	no	min.	min.	min.	min.	DA
1-1	B	Triangle	0	0	0	no	min.	min.	min.	min.	DA
1-1	C	Parabolic	0	0	0	no	min.	min.	min.	min.	DA
1-2	A	Constant	Constant	0	0	no	min.	min.	min.	min.	DA

1-2	B	Constant	Tide	0	0	no	min.	min.	min.	min.	DA
1-2	C	Constant	Storm surge	0	0	no	min.	min.	min.	min.	DA
1-2	D	Constant	Storm surge+tide	0	0	no	min.	min.	min.	min.	DA
1-3	A	Parabolic	Storm surge+tide	0	0	no	min.	min.	min.	min.	DA
1-3	B	Parabolic	Storm surge+tide	26	0	no	min.	min.	min.	min.	DA
1-3	C	Parabolic	Storm surge+tide	0	26	no	min.	min.	min.	min.	DA
1-3	D	Parabolic	Storm surge+tide	26	26	no	min.	min.	min.	min.	DA
Test **2**											
2-1	A	Constant	0	0	0	yes	min.	min.	min.	min.	DA
2-1	B	Triangle	0	0	0	yes	min.	min.	min.	min.	DA
2-1	C	Parabolic	0	0	0	yes	min.	min.	min.	min.	DA
2-2	A	Constant	Constant	0	0	yes	min.	min.	min.	min.	DA
2-2	B	Constant	Tide	0	0	yes	min.	min.	min.	min.	DA
2-2	C	Constant	Storm surge	0	0	yes	min.	min.	min.	min.	DA
2-2	D	Constant	Storm surge+tide	0	0	yes	min.	min.	min.	min.	DA
2-3	A	Parabolic	Storm surge+tide	0	0	yes	min.	min.	min.	min.	DA
2-3	B	Parabolic	Storm surge+tide	26	0	yes	min.	min.	min.	min.	DA
2-3	C	Parabolic	Storm surge+tide	0	26	yes	min.	min.	min.	min.	DA
2-3	D	Parabolic	Storm surge+tide	26	26	yes	min.	min.	min.	min.	DA
Test 3-1											
3-1-1	A	Constant	0	0	0	no	max.	min.	min.	min.	DA
3-1-1	B	Triangle	0	0	0	no	max.	min.	min.	min.	DA
3-1-1	C	Parabolic	0	0	0	no	max.	min.	min.	min.	DA
3-1-2	A	Constant	Constant	0	0	no	max.	min.	min.	min.	DA
3-1-2	B	Constant	Tide	0	0	no	max.	min.	min.	min.	DA
3-1-2	C	Constant	Storm surge	0	0	no	max.	min.	min.	min.	DA
3-1-2	D	Constant	Storm surge+tide	0	0	no	max.	min.	min.	min.	DA
3-1-3	A	Parabolic	Storm surge+tide	0	0	no	max.	min.	min.	min.	DA
3-1-3	B	Parabolic	Storm surge+tide	26	0	no	max.	min.	min.	min.	DA
3-1-3	C	Parabolic	Storm surge+tide	0	26	no	max.	min.	min.	min.	DA
3-1-3	D	Parabolic	Storm surge+tide	26	26	no	max.	min.	min.	min.	DA
Test 3-2											
3-2-1	A	Constant	0	0	0	yes	max.	min.	min.	min.	DA
3-2-1	B	Triangle	0	0	0	yes	max.	min.	min.	min.	DA
3-2-1	C	Parabolic	0	0	0	yes	max.	min.	min.	min.	DA
3-2-2	A	Constant	Constant	0	0	yes	max.	min.	min.	min.	DA
3-2-2	B	Constant	Tide	0	0	yes	max.	min.	min.	min.	DA
3-2-2	C	Constant	Storm surge	0	0	yes	max.	min.	min.	min.	DA
3-2-2	D	Constant	Storm surge+tide	0	0	yes	max.	min.	min.	min.	DA
3-2-3	A	Parabolic	Storm surge+tide	0	0	yes	max.	min.	min.	min.	DA
3-2-3	B	Parabolic	Storm surge+tide	26	0	yes	max.	min.	min.	min.	DA
3-2-3	C	Parabolic	Storm surge+tide	0	26	yes	max.	min.	min.	min.	DA
3-2-3	D	Parabolic	Storm surge+tide	26	26	yes	max.	min.	min.	min.	DA

Table III-2 The minimum and maximum values for the parameters that are examined in the 2D flow case study

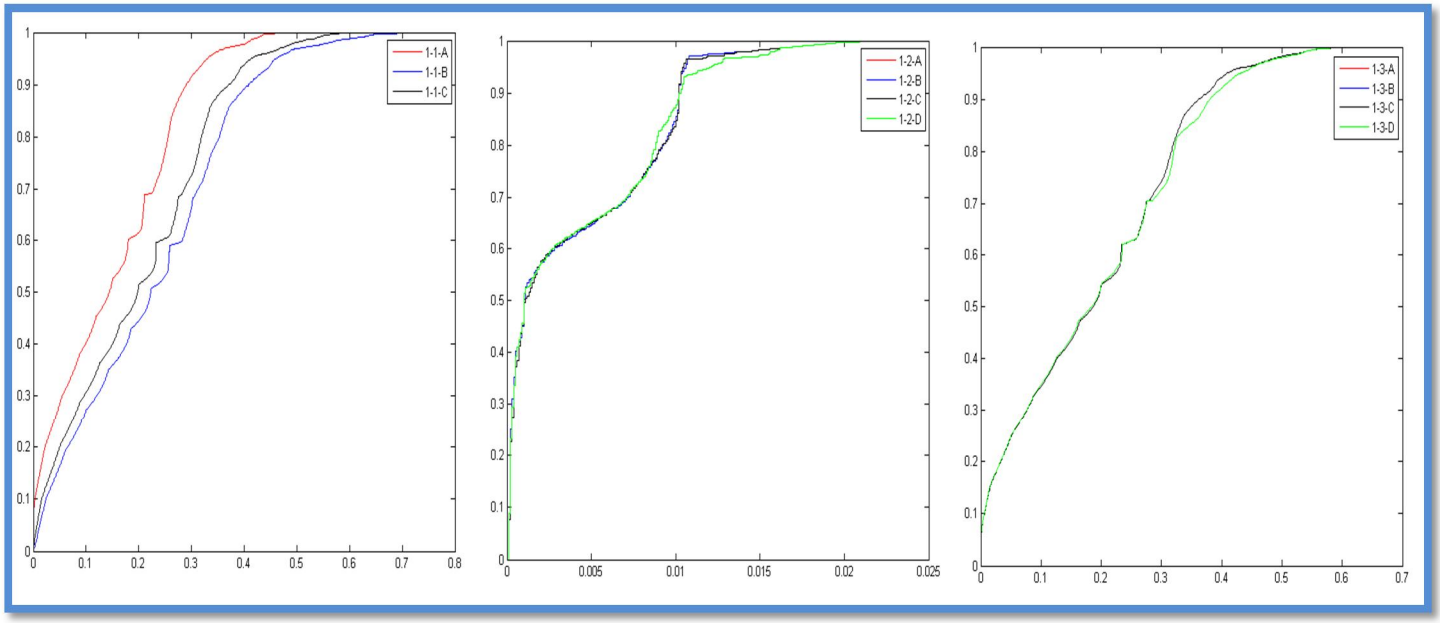
		Width of channel: B_c [m]	Roughness of channel: n_c [s/m$^{1/3}$]	Bed level: z_b [m]	Roughness of floodplain: n_f [s/m$^{1/3}$]
Class C	Min	10	0.03	1	0.035
	Max.	50	0.05	5	0.07
Class DA	Min	50	0.03	1	0.035
	Max.	100	0.05	5	0.07

IV. Results of simulations for 2D schematization

Class C test 1: Boundary conditions

Class C test 1:Water depth

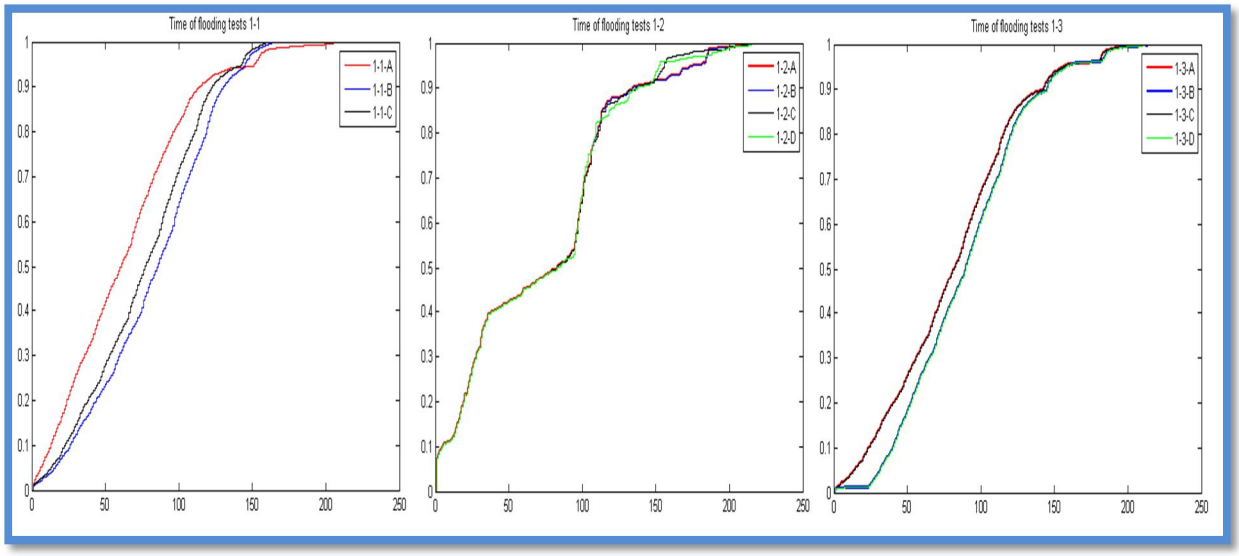
Empirical cumulative distribution for water depth



Test 1	Median	Angle				
test 1-1-A	0.1443	68.74	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-1-B	0.2225	63.22	-0.5419	0.0802	0.6222	3
test 1-1-C	0.1981	67.09	-0.3728	0.0240	0.3968	2
test 1-2-A	0.001	89.14	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-2-B	0.001	89.14	0	0	0	0
test 1-2-C	0.001	89.15	0	-5.36E-05	0.0001	1
test 1-2-D	0.001	89.18	0	-4.28E-04	0.0004	1
test 1-3-A	0.187	64.41	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-3-B	0.184	64.65	0.01604	-0.00387	0.0199	1
test 1-3-C	0.187	64.41	0	0	0	0
test 1-3-D	0.184	64.65	0.01604	-0.00387	0.0199	1

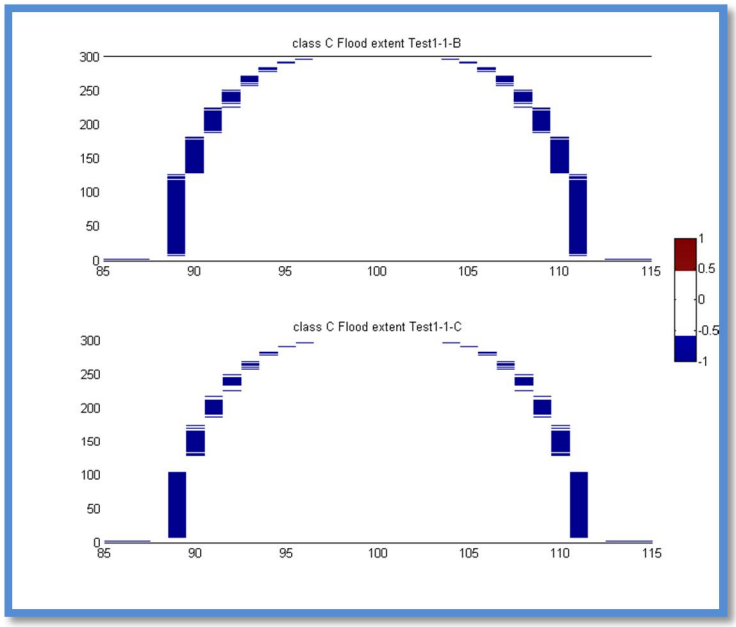
Class C test 1:Onset time of flooding

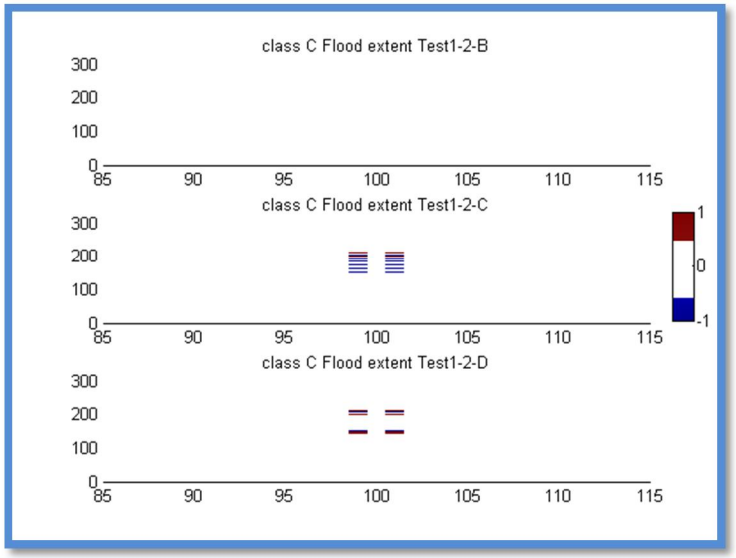
Empirical cumulative distribution for onset time of flooding

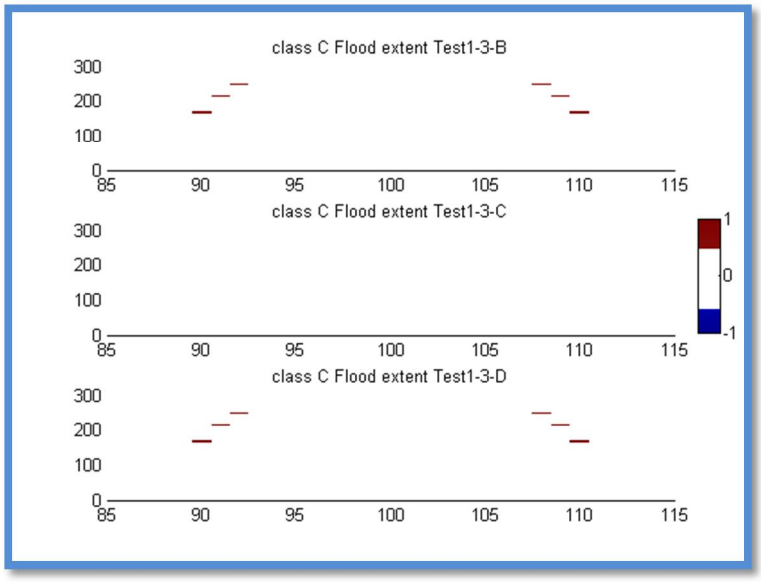


Test 1	Median	Angle				
test 1-1-A	60	0.477	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-1-B	85	0.513	0.417	0.075	0.491	3
test 1-1-C	76	0.430	0.267	0.100	0.367	2
test 1-2-A	83	0.313	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-2-B	83	0.313	0.000	0.000	0	0
test 1-2-C	80	0.310	0.036	0.009	0.045	1
test 1-2-D	83	0.315	0.000	0.009	0.009	1
test 1-3-A	81	0.458	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 1-3-B	89	0.506	0.099	0.103	0.202	1
test 1-3-C	81	0.458	0.000	0.000	0.000	0
test 1-3-D	89	0.506	0.099	0.103	0.202	1

Class C test 1:Flood extent



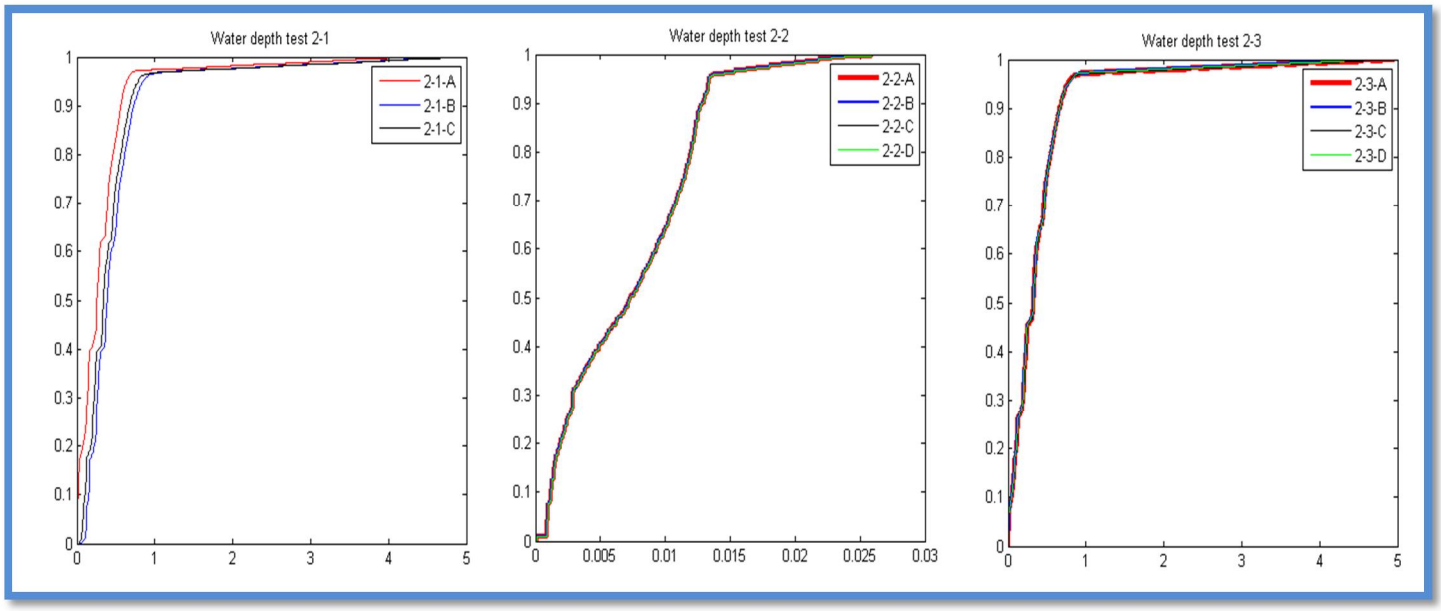




Class C test 2: Slope in the perpendicular direction of channel

Class C test 2:Water depth

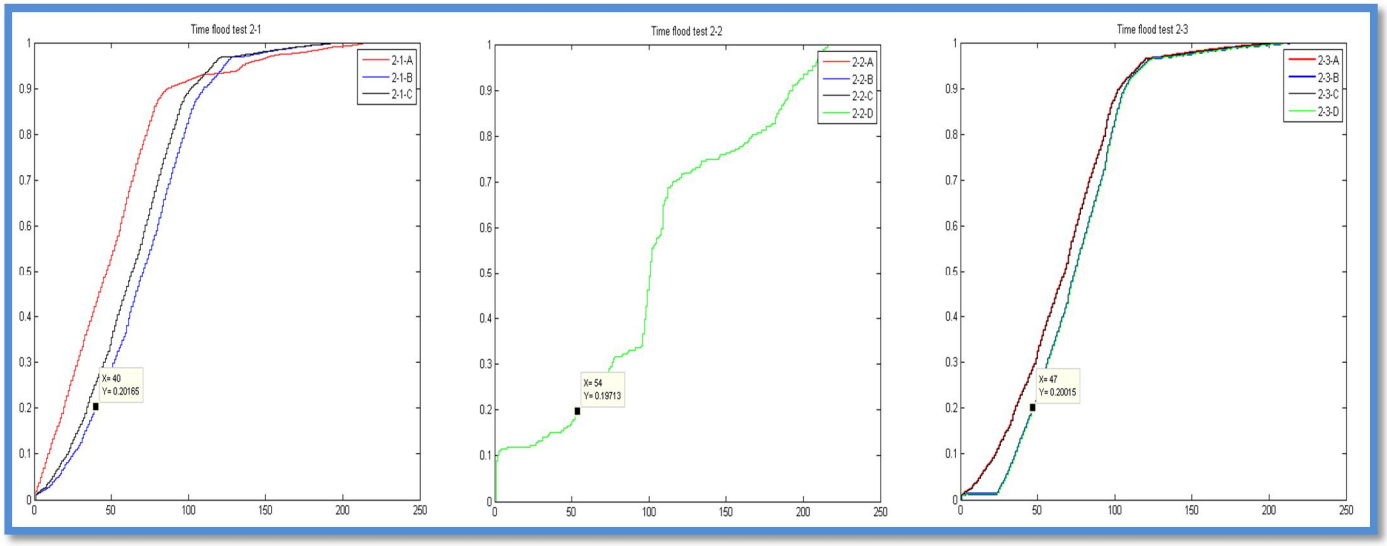
Empirical cumulative distribution



Test 2	Median	Angle				
test 2-1-A	0.2563	57.26	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-1-B	0.3876	56.70	0.512	0.010	0.522	3
test 2-1-C	0.3407	57.58	0.329	0.006	0.335	2
test 2-2-A	0.0072	89.05	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-2-B	0.0072	89.05	0	0	0	0
test 2-2-C	0.0072	89.05	0	0	0	0
test 2-2-D	0.0072	89.05	0	0	0	0
test 2-3-A	0.326	54.24	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-3-B	0.3247	54.06	0.00399	0.00335	0.00734	1
test 2-3-C	0.326	54.24	0.00000	0.00000	0.00000	0
test 2-3-D	0.3247	54.06	0.00399	0.00335	0.00734	1

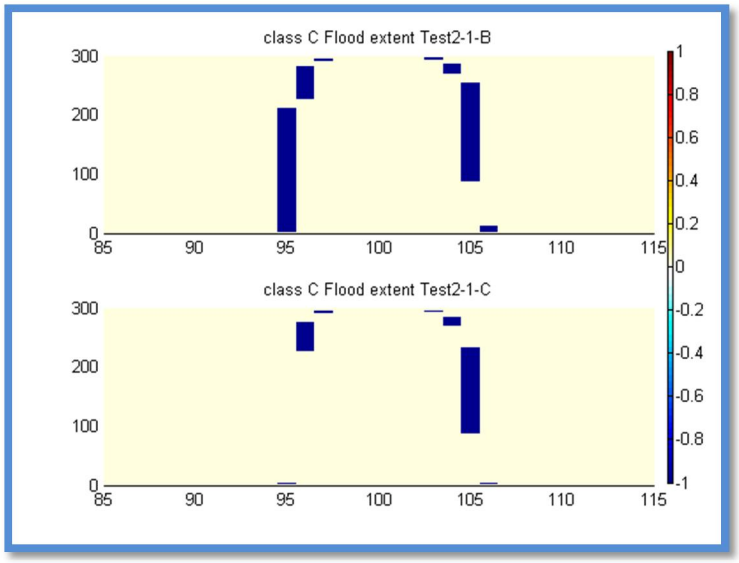
Class C test 2:Onset time of flooding

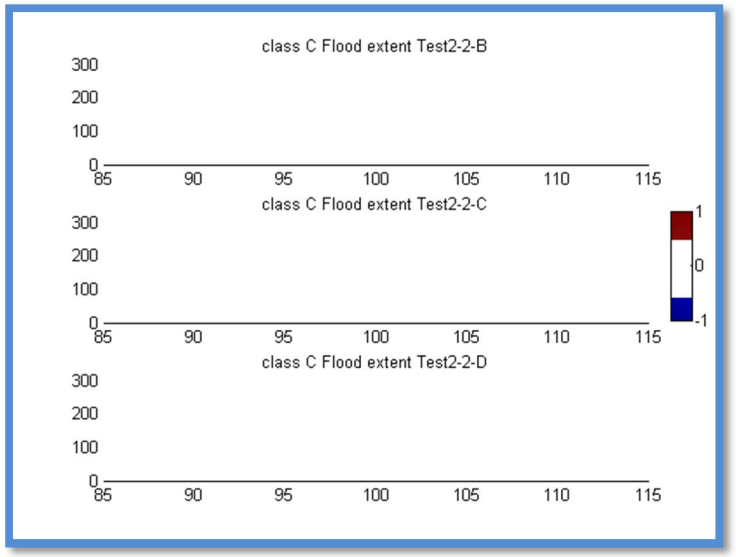
Empirical cumulative distribution

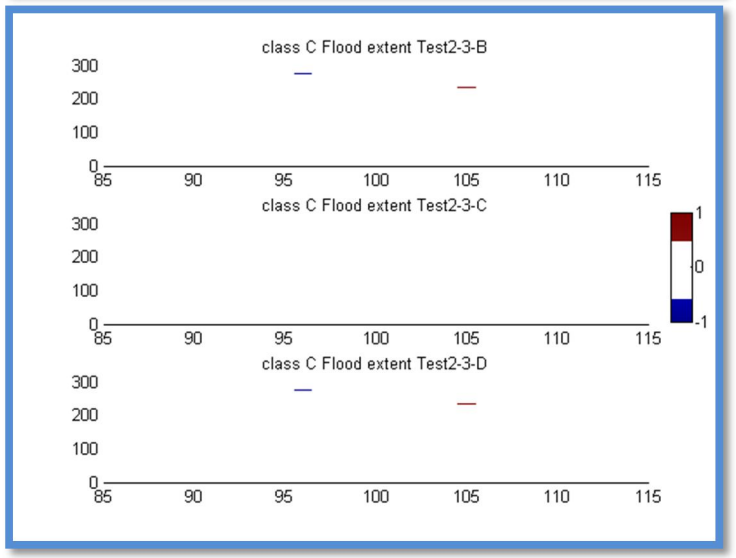


Test 2	Median	Angle				
test 2-1-A	46	0.6486	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-1-B	70	0.6139	0.5217	0.0536	0.5753	3
test 2-1-C	63	0.6366	0.3696	0.0185	0.3881	2
test 2-2-A	100	0.3097	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-2-B	100	0.3097	0	0	0	0
test 2-2-C	100	0.3097	0	0	0	0
test 2-2-D	100	0.3097	0	0	0	0
test 2-3-A	67	0.5927	Δ_{median}	Δ_{angle}	$F_{difference}$	Factor of influence
test 2-3-B	74	0.6740	0.1045	0.1372	0.2417	1
test 2-3-C	67	0.5927	0	0	0	0
test 2-3-D	74	0.6740	0.1045	0.1372	0.2417	1

Class C test 2: Flood extent



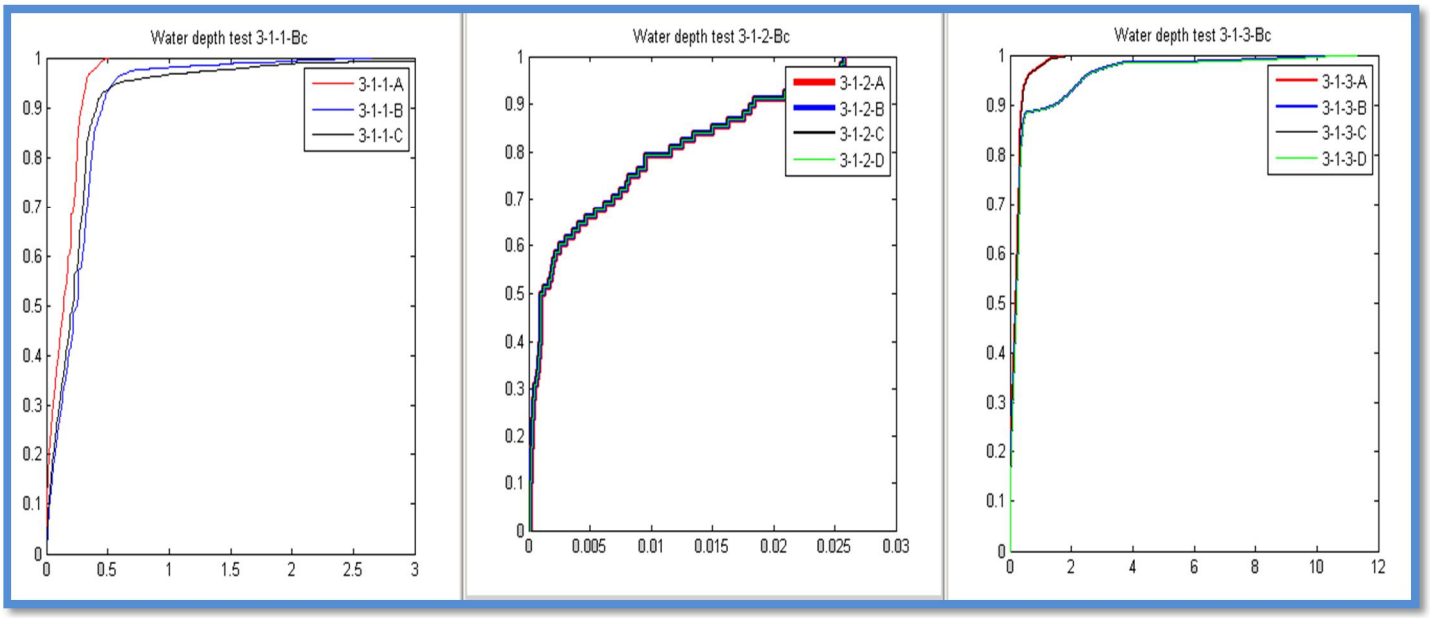




Class C test 3: Varying parameters

Class C test 3:Channel width: Water depth

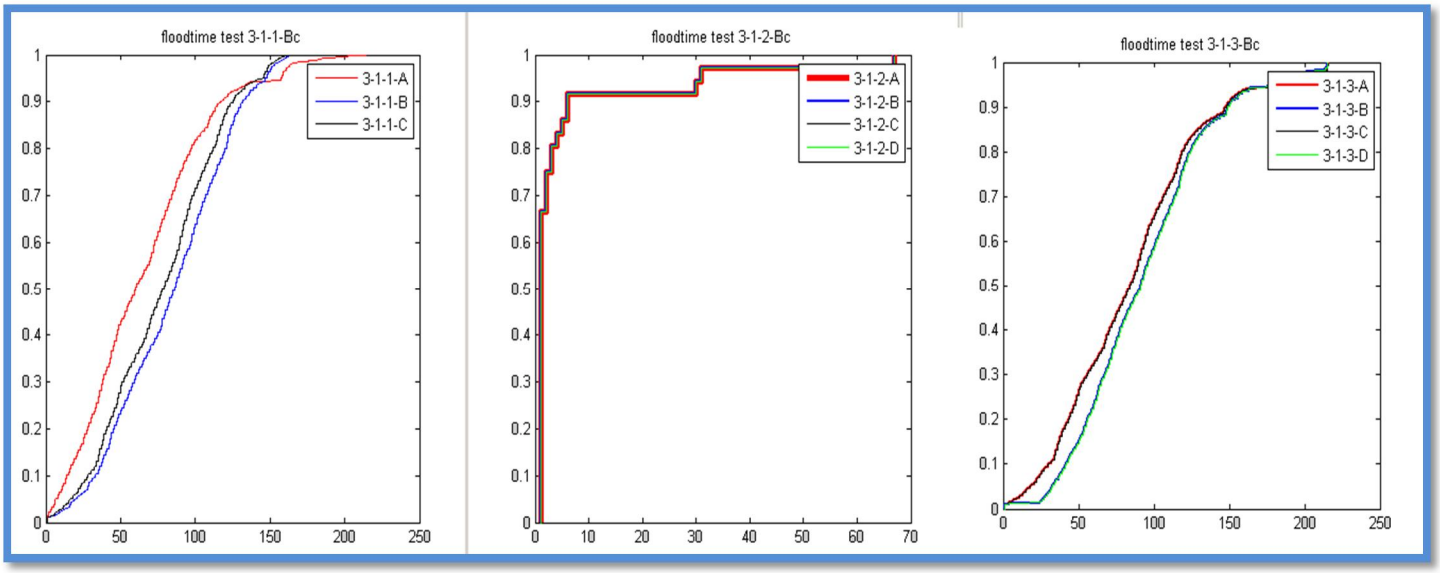
Empirical cumulative distribution tests 3-1 Bc



	Test 3 Bc		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	0.1397	69.3	0.1443	68.74	0.04
test 1-1-B	0.2466	63.6	0.2225	63.22	0.10
test 1-1-C	0.2159	66.1	0.1981	67.09	0.10
test 1-2-A	0.001	88.9	0.001	89.14	0
test 1-2-B	0.001	88.9	0.001	89.14	0
test 1-2-C	0.001	88.9	0.001	89.15	0
test 1-2-D	0.001	88.9	0.001	89.18	0
test 1-3-A	0.1956	64.5	0.187	64.41	0.05
test 1-3-B	0.2279	62.1	0.184	64.65	0.23
test 1-3-C	0.1956	64.5	0.187	64.41	0.05
test 1-3-D	0.2279	62.1	0.184	64.65	0.23

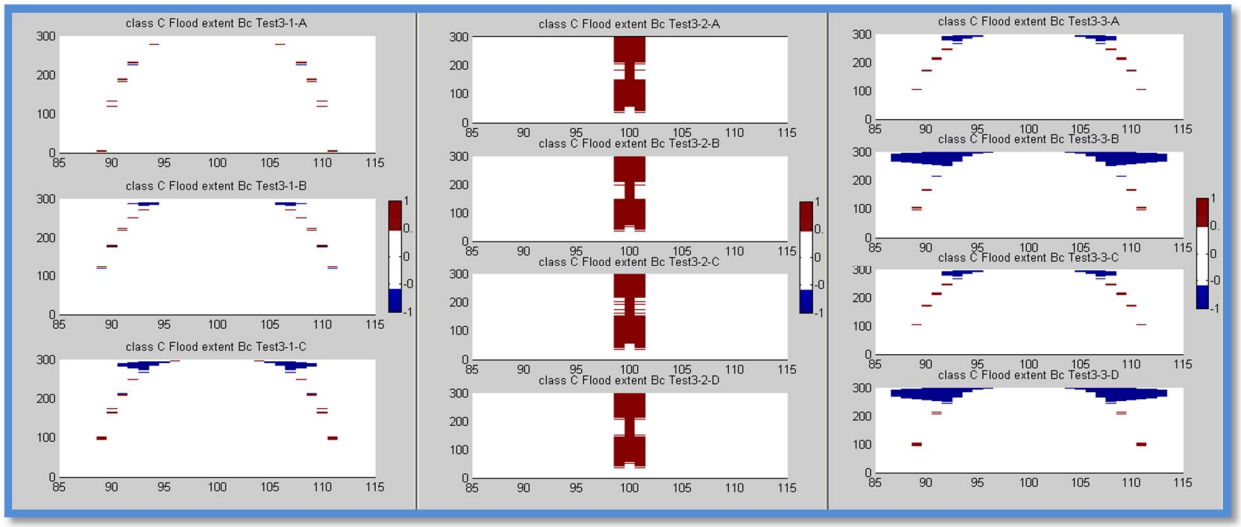
Class C test 3:Channel width: Onset time of flooding

Empirical cumulative distribution tests 3-1 Bc



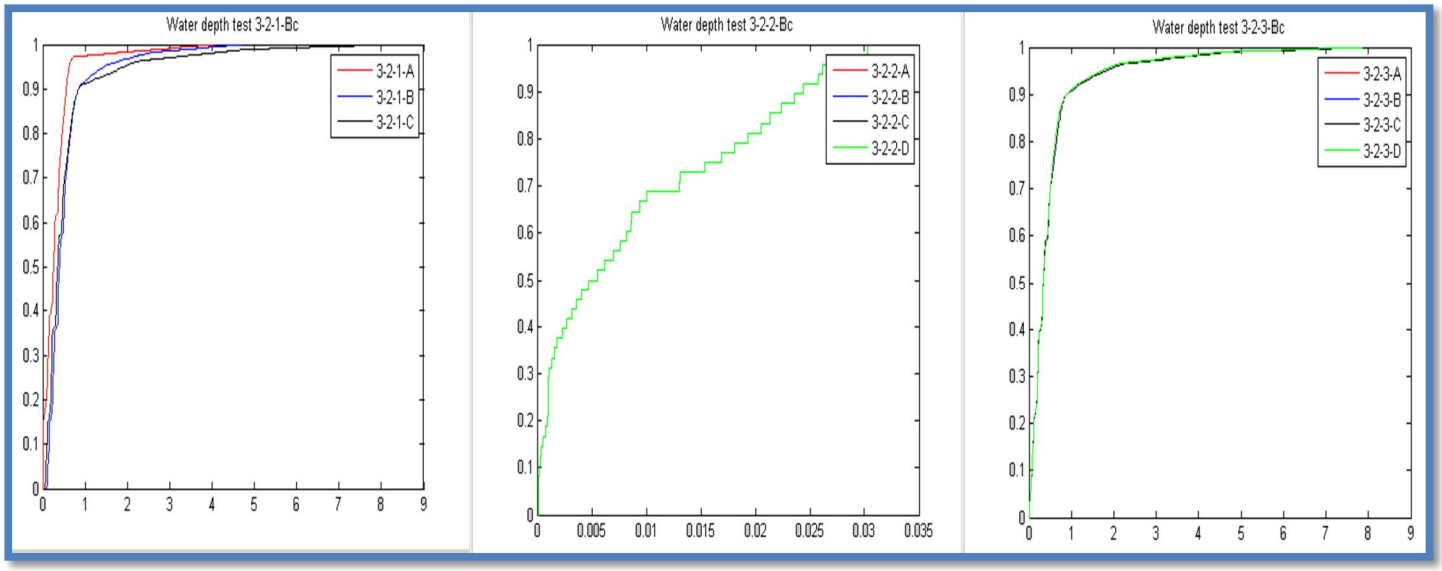
	Test 3 Bc		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**60**	**0.498**	**60**	**0.477**	0.04
test 1-1-B	86	0.465	85	0.513	0.11
test 1-1-C	79	0.484	76	0.430	0.16
test 1-2-A	**1**	**16.699**	**83**	**0.313**	134.43
test 1-2-B	1	16.699	83	0.313	134.43
test 1-2-C	1	16.699	80	0.310	131.92
test 1-2-D	1	16.699	83	0.315	133.95
test 1-3-A	**84**	**0.452**	**81**	**0.458**	0.05
test 1-3-B	91	0.506	89	0.506	0.02
test 1-3-C	84	0.452	81	0.458	0.05
test 1-3-D	91	0.506	89	0.506	0.02

Class C test 3:Channel width: Flood extent



Class C test 3:Channel width: Water depth

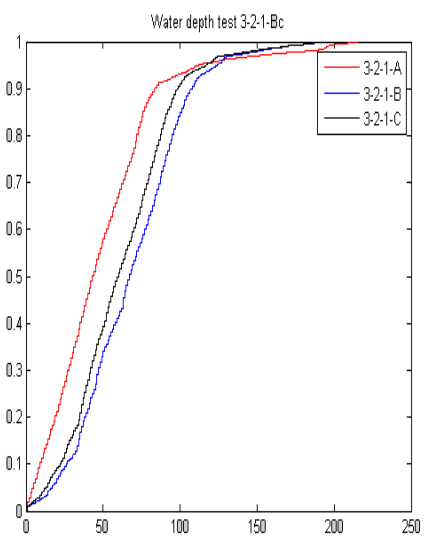
Empirical cumulative distribution

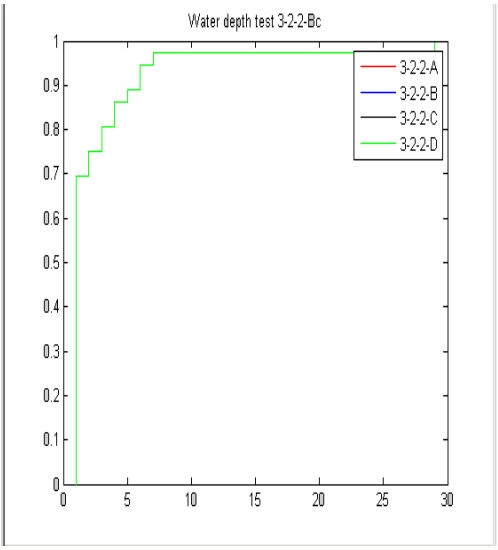


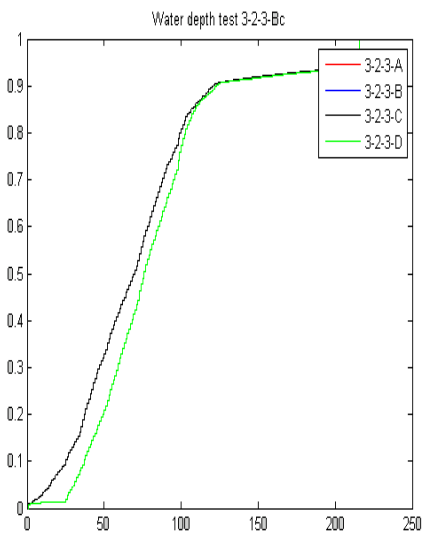
	Test 3-2 Bc		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.2528	57.7	0.2563	57.3	0.02
test 2-1-B	0.3964	54.5	0.3876	56.7	0.06
test 2-1-C	0.3537	52.9	0.3407	57.6	0.12
test 2-2-A	0.0047	88.4	0.0072	89.0	0.54
test 2-2-B	0.0047	88.4	0.0072	89.0	0.54
test 2-2-C	0.0047	88.4	0.0072	89.0	0.54
test 2-2-D	0.0047	88.4	0.0072	89.0	0.54
test 2-3-A	0.3373	48.0	0.326	54.2	0.15
test 2-3-B	0.333	49.5	0.3247	54.1	0.11
test 2-3-C	0.3373	48.0	0.326	54.2	0.15
test 2-3-D	0.333	49.5	0.3247	54.1	0.11

Class C test 3:Channel width: Onset time of flooding

Empirical cumulative distribution for onset time of flood



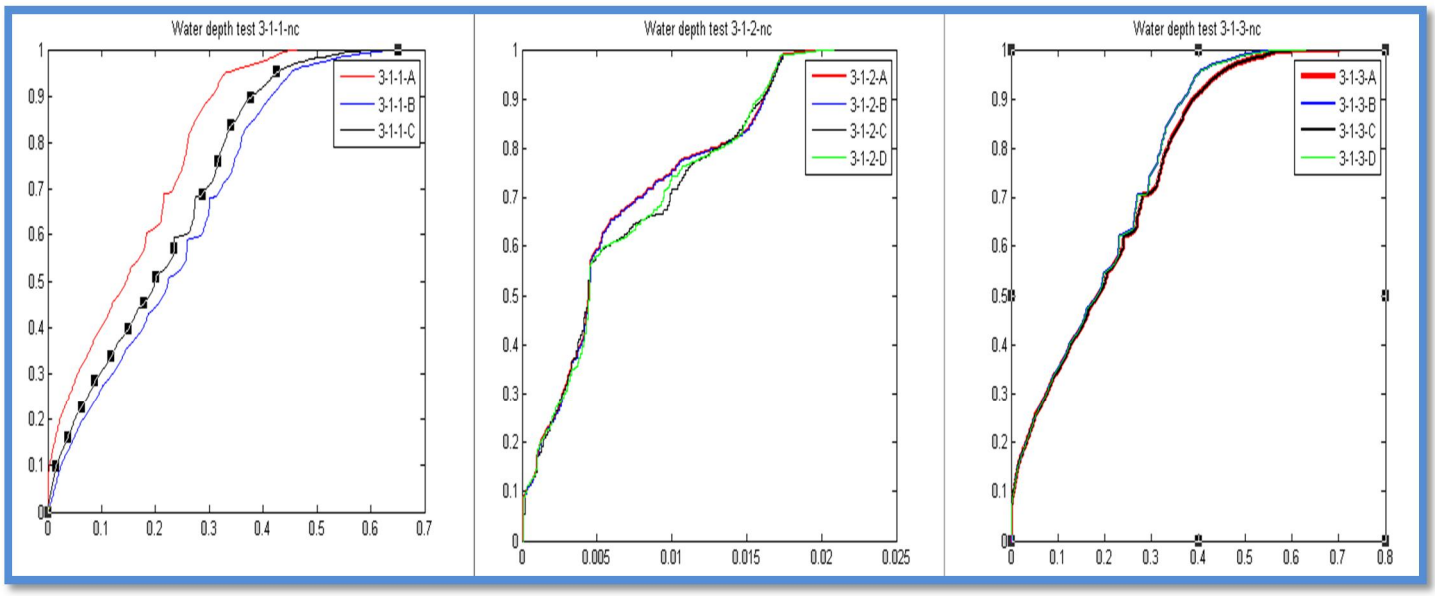




	Test 3-2 Bc		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	43	0.649	46	0.6486	0.07
test 2-1-B	67	0.603	70	0.6139	0.06
test 2-1-C	60	0.661	63	0.6366	0.09
test 2-2-A	1	16.699	100	0.3097	151.92
test 2-2-B	1	16.699	100	0.3097	151.92
test 2-2-C	1	16.699	100	0.3097	151.92
test 2-2-D	1	16.699	100	0.3097	151.92
test 2-3-A	70	0.546	67	0.5927	0.12
test 2-3-B	76	0.637	74	0.6740	0.08
test 2-3-C	70	0.546	67	0.5927	0.12
test 2-3-D	76	0.637	74	0.6740	0.08

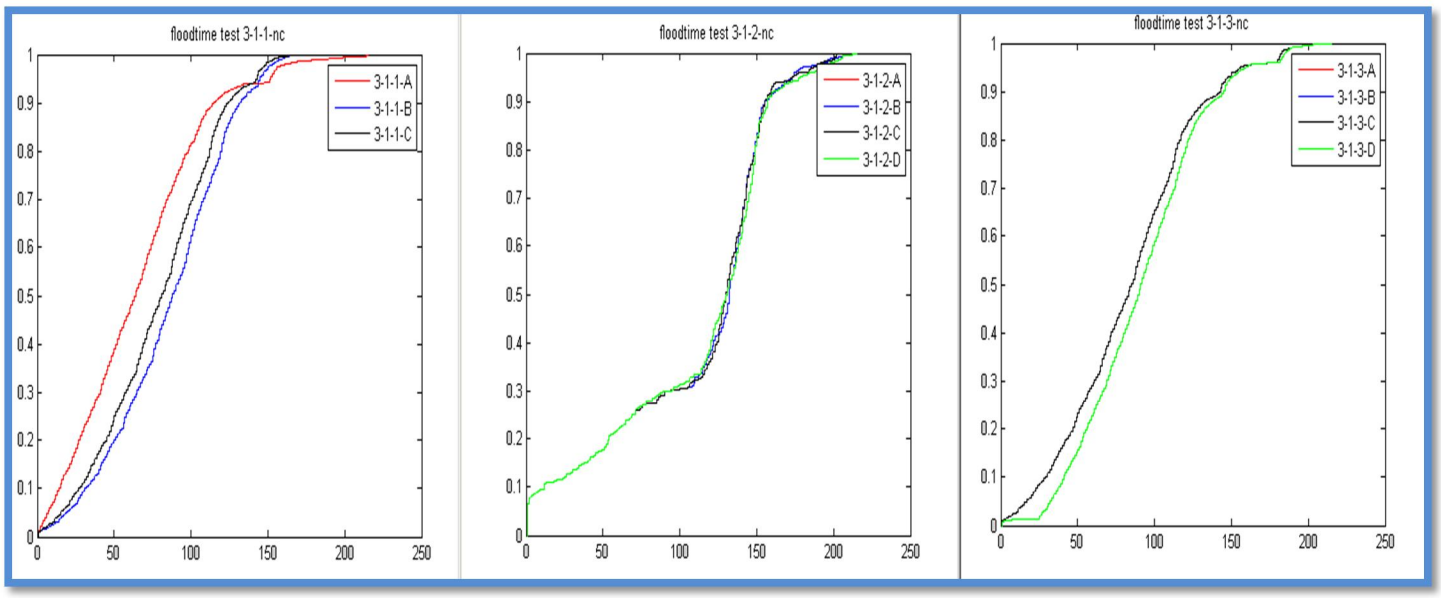
Class C test 3:Channel roughness coefficient: Water depth

Empirical cumulative distribution for water depth tests 3 n_c



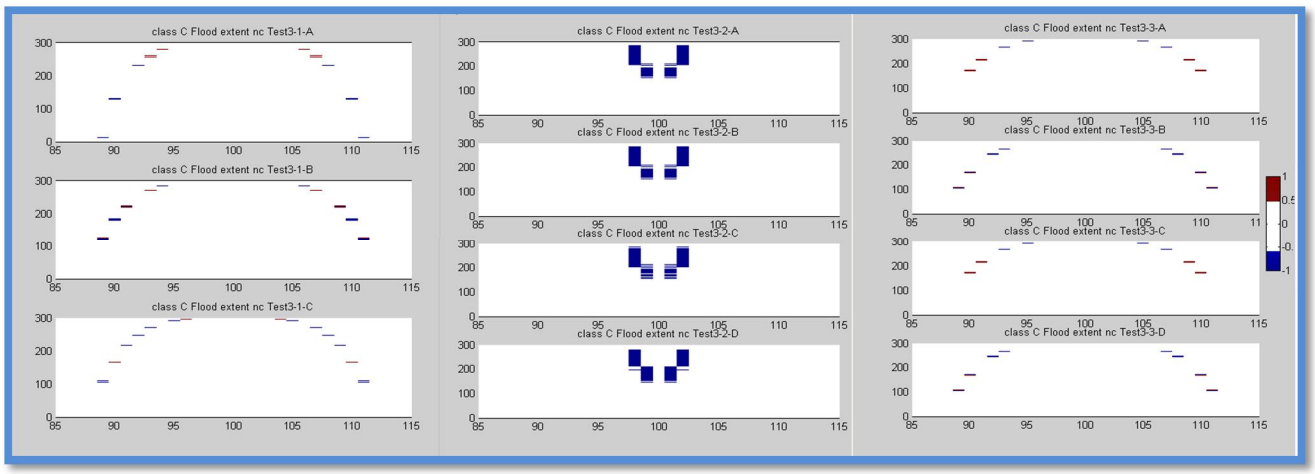
	Test **3** n_c		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**0.1459**	**68.42**	0.1443	68.74	0.02
test 1-1-B	0.2237	64.02	0.2225	63.22	0.02
test 1-1-C	0.1996	65.22	0.1981	67.09	0.04
test 1-2-A	**0.0045**	**88.90**	0.001	89.14	0.78
test 1-2-B	0.0045	88.90	0.001	89.14	0.78
test 1-2-C	0.0044	88.88	0.001	89.15	0.78
test 1-2-D	0.0045	88.85	0.001	89.18	0.78
test 1-3-A	**0.1871**	**63.31**	0.187	64.41	0.02
test 1-3-B	0.1850	64.32	0.184	64.65	0.01
test 1-3-C	0.1871	63.31	0.187	64.41	0.02
test 1-3-D	0.1850	64.32	0.184	64.65	0.01

Class C test 3:Channel roughness coefficient: Onset time of flooding test 3-1



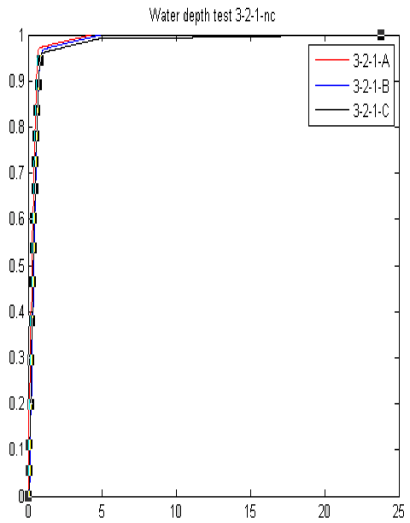
	Test 3 n_c		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**64**	**0.484**	**60**	**0.477**	0.08
test 1-1-B	88	0.498	85	0.513	0.06
test 1-1-C	81	0.513	76	0.430	0.26
test 1-2-A	**132**	**0.362**	**83**	**0.313**	0.53
test 1-2-B	132	0.362	83	0.313	0.53
test 1-2-C	130	0.362	80	0.310	0.55
test 1-2-D	131	0.362	83	0.315	0.51
test 1-3-A	**85**	**0.491**	**81**	**0.458**	0.12
test 1-3-B	91	0.521	89	0.506	0.05
test 1-3-C	85	0.491	81	0.458	0.12
test 1-3-D	91	0.521	89	0.506	0.05

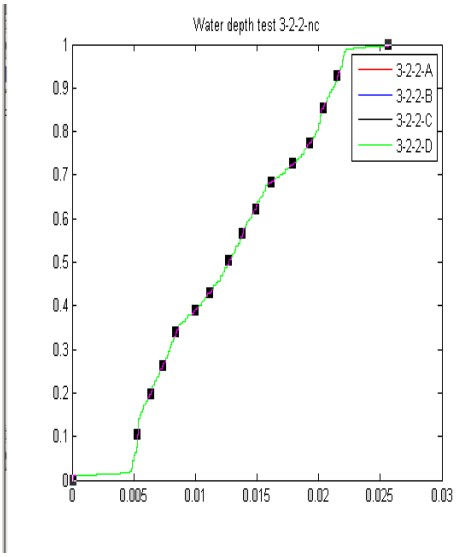
Class C test 3:Channel roughness coefficient: Flood extent test 3-1

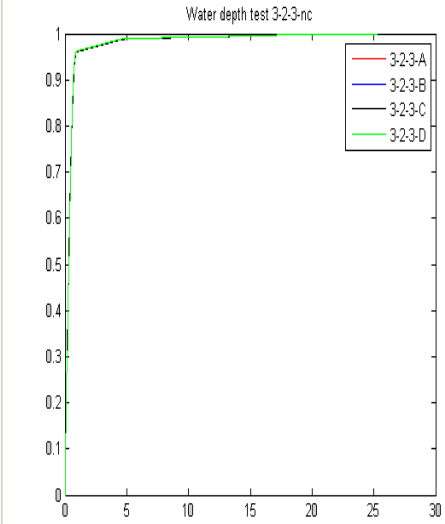


Class C test 3:Channel roughness coefficient: Water depth test 3-2

Empirical cumulative distribution



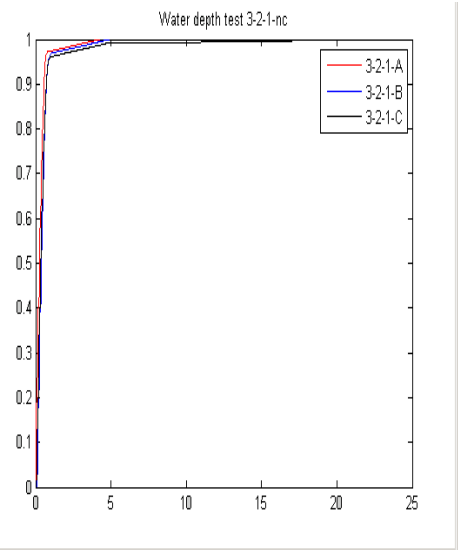


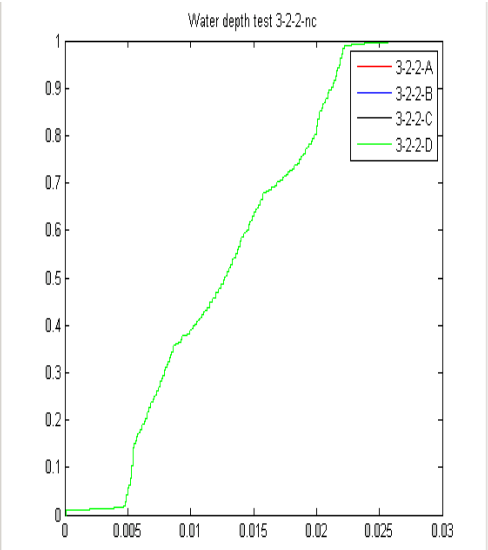


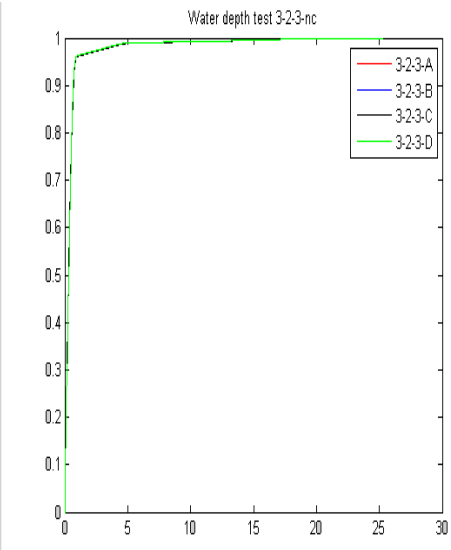
	Test 3-2 nc		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.258	57.04	0.2563	57.3	0.01
test 2-1-B	0.3868	57.05	0.3876	56.7	0.01
test 2-1-C	0.3362	55.20	0.3407	57.6	0.05
test 2-2-A	0.0127	88.72	0.0072	89.0	0.44
test 2-2-B	0.0127	88.72	0.0072	89.0	0.44
test 2-2-C	0.0127	88.72	0.0072	89.0	0.44
test 2-2-D	0.0127	88.72	0.0072	89.0	0.44
test 2-3-A	0.3242	52.67	0.326	54.2	0.03
test 2-3-B	0.3337	53.26	0.3247	54.1	0.04
test 2-3-C	0.3242	52.67	0.326	54.2	0.03
test 2-3-D	0.3337	53.26	0.3247	54.1	0.04

Class C test 3:Channel roughness coefficient: Onset time of flooding test 3-2

Empirical cumulative distribution



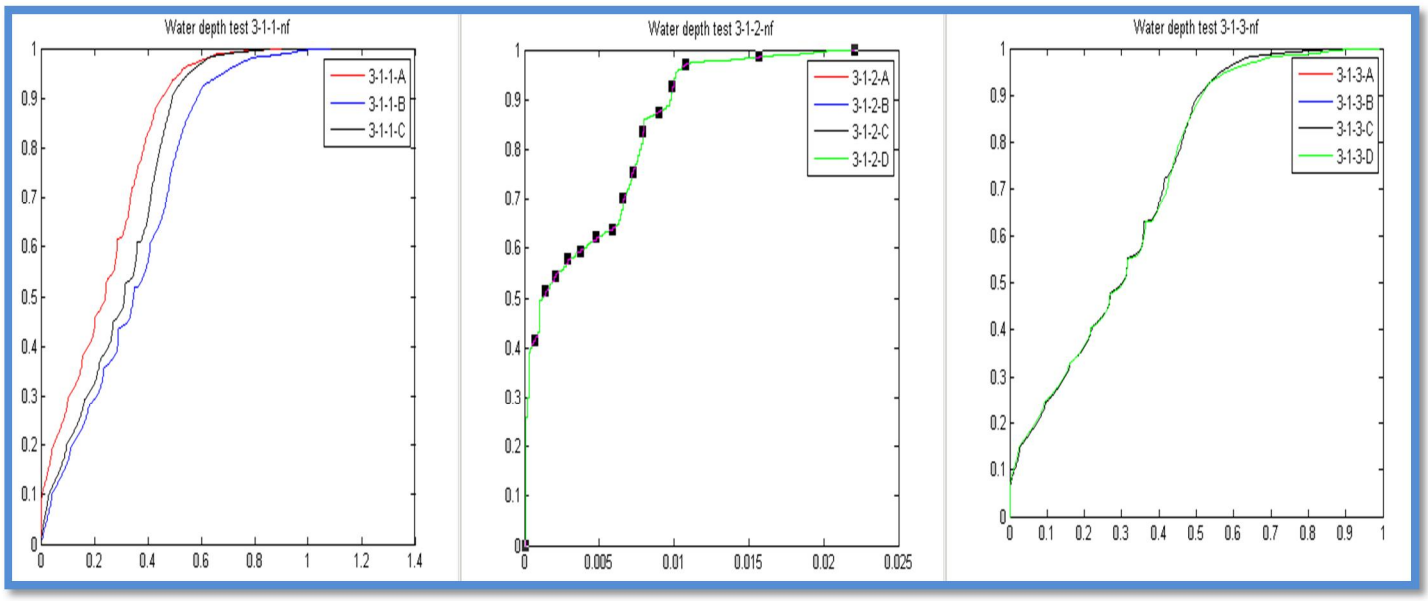




	Test 3-2 nc		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	47	0.637	46	0.6486	0.04
test 2-1-B	71	0.614	70	0.6139	0.01
test 2-1-C	64	0.614	63	0.6366	0.05
test 2-2-A	106	0.366	100	0.3097	0.24
test 2-2-B	106	0.366	100	0.3097	0.24
test 2-2-C	106	0.366	100	0.3097	0.24
test 2-2-D	106	0.366	100	0.3097	0.24
test 2-3-A	68	0.593	67	0.5927	0.01
test 2-3-B	75	0.688	74	0.6740	0.03
test 2-3-C	68	0.593	67	0.5927	0.01
test 2-3-D	75	0.688	74	0.6740	0.03

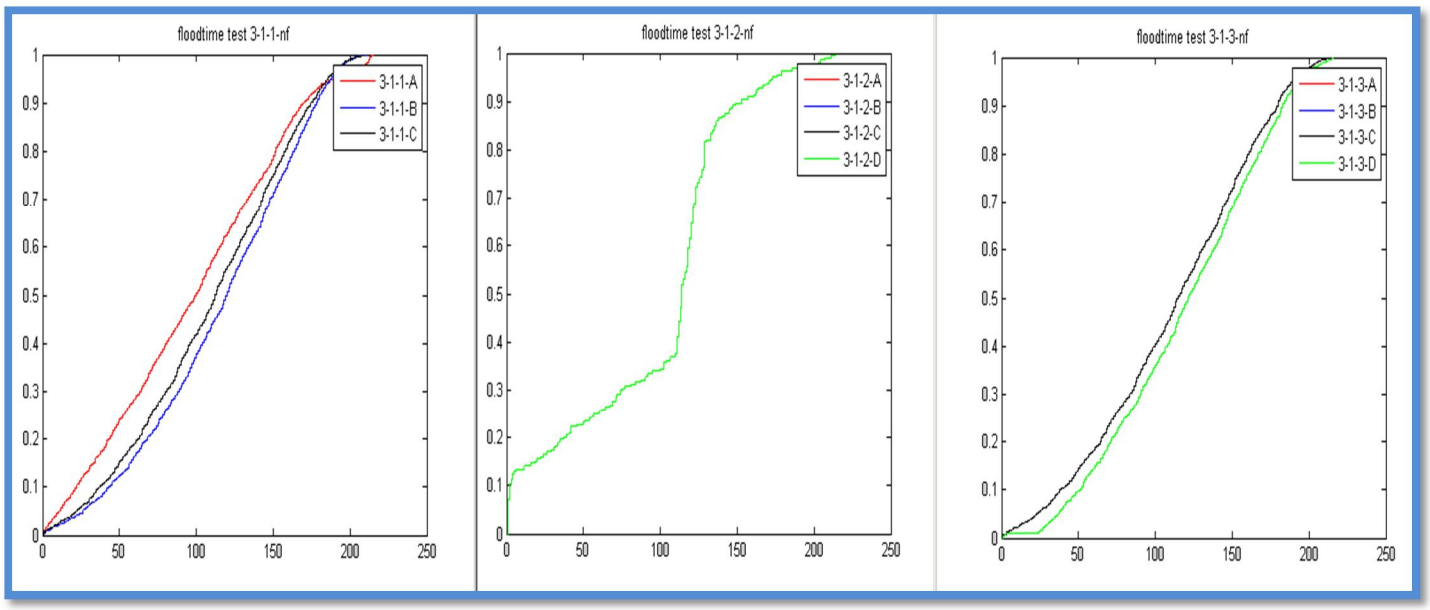
Class C test 3:Floodplain roughness coefficient: Water depth tests 3-1

Empirical cumulative distribution



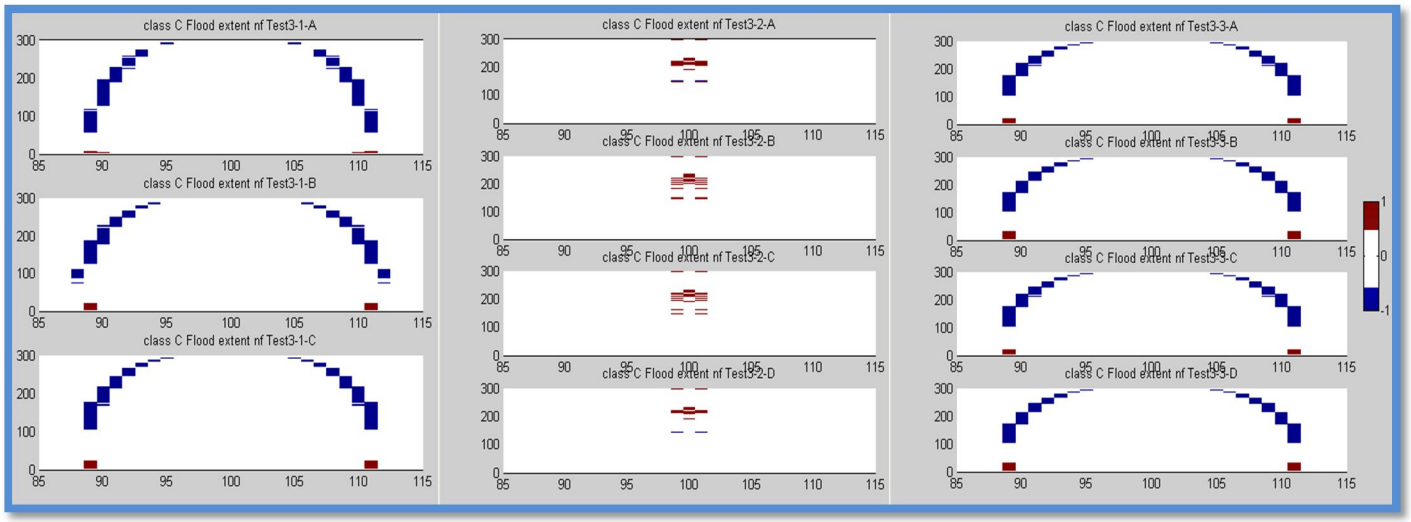
	Test **3** n_f		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**0.2412**	**60.56**	0.1443	68.74	0.52
test 1-1-B	0.3472	56.82	0.2225	63.22	0.46
test 1-1-C	0.3127	59.70	0.1981	67.09	0.48
test 1-2-A	**0.0012**	**89.27**	0.001	89.14	0.17
test 1-2-B	0.0012	89.27	0.001	89.14	0.17
test 1-2-C	0.0012	89.27	0.001	89.15	0.17
test 1-2-D	0.0012	89.27	0.001	89.18	0.17
test 1-3-A	**0.3018**	**57.14**	0.187	64.41	0.49
test 1-3-B	0.3054	57.29	0.184	64.65	0.51
test 1-3-C	0.3018	57.14	0.187	64.41	0.49
test 1-3-D	0.3054	57.29	0.184	64.65	0.51

Class C test 3:Floodplain roughness coefficient: Onset time of flooding tests 3-1



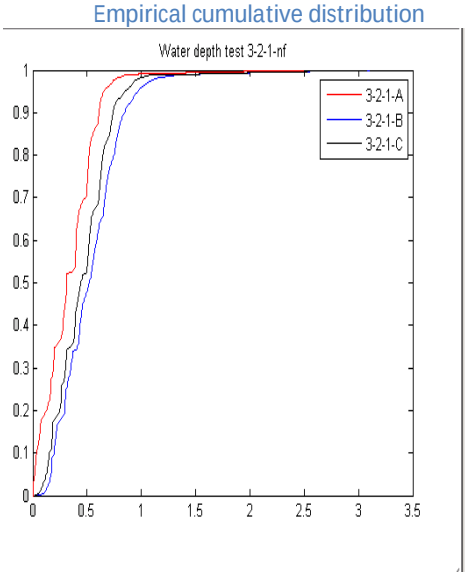
	Test 3 n_f		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**100**	**0.3154**	**60**	**0.477**	0.74
test 1-1-B	120	0.3619	85	0.513	0.59
test 1-1-C	112	0.3581	76	0.430	0.49
test 1-2-A	**114**	**0.3737**	**83**	**0.313**	0.47
test 1-2-B	114	0.3737	83	0.313	0.47
test 1-2-C	114	0.3737	80	0.310	0.50
test 1-2-D	114	0.3737	83	0.315	0.46
test 1-3-A	**115**	**0.3544**	**81**	**0.458**	0.52
test 1-3-B	121	0.3581	89	0.506	0.56
test 1-3-C	115	0.3544	81	0.458	0.52
test 1-3-D	121	0.3581	89	0.506	0.56

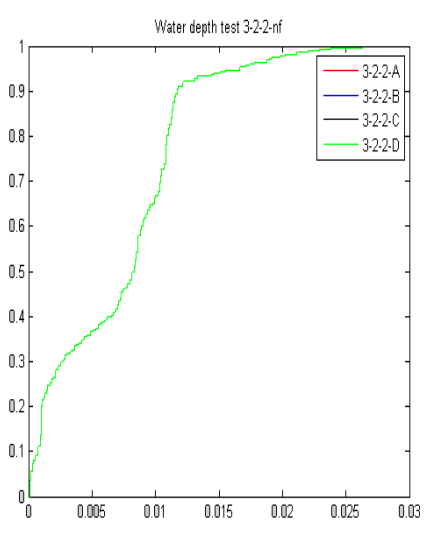
Class C test 3:Floodplain roughness coefficient: Flood extent tests 3-1

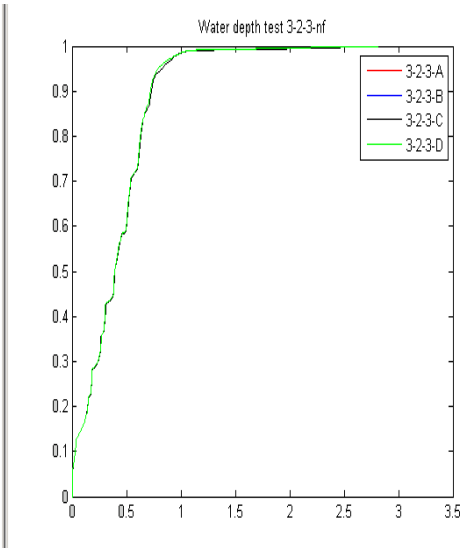


Class C test 3:Floodplain roughness coefficient: Water depth tests 3-2

Empirical cumulative distribution



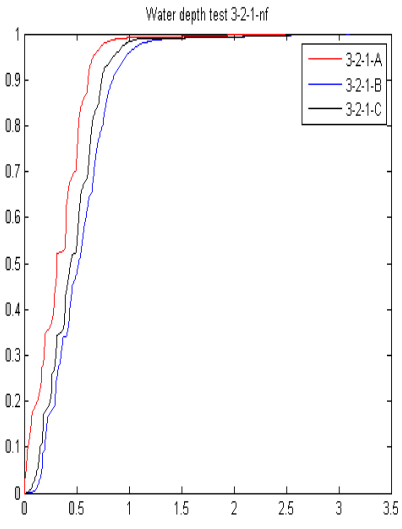


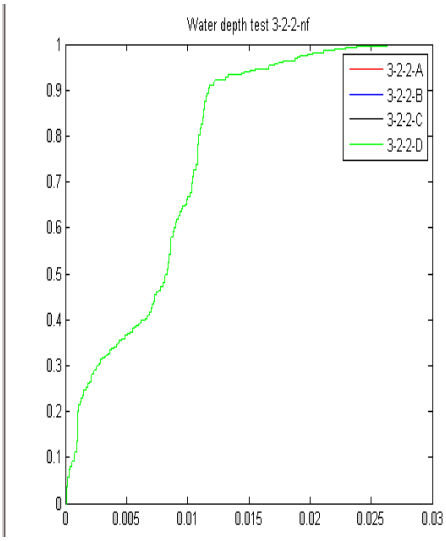


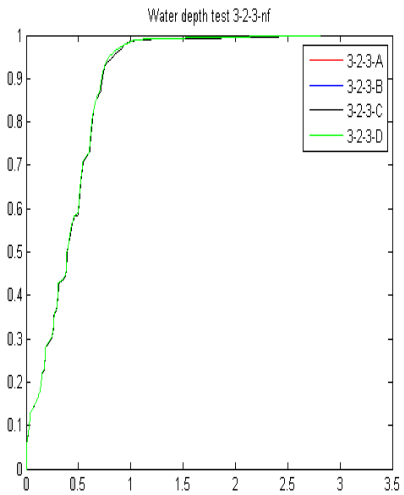
	Test 3-2 nc		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.3127	56.78	0.2563	57.3	0.19
test 2-1-B	0.5184	53.15	0.3876	56.7	0.31
test 2-1-C	0.4426	56.32	0.3407	57.6	0.25
test 2-2-A	0.0082	89.05	0.0072	89.0	0.12
test 2-2-B	0.0082	89.05	0.0072	89.0	0.12
test 2-2-C	0.0082	89.05	0.0072	89.0	0.12
test 2-2-D	0.0082	89.05	0.0072	89.0	0.12
test 2-3-A	0.3928	50.84	0.326	54.2	0.23
test 2-3-B	0.388	51.19	0.3247	54.1	0.22
test 2-3-C	0.3928	50.84	0.326	54.2	0.23
test 2-3-D	0.388	51.19	0.3247	54.1	0.22

Class C test 3:Floodplain roughness coefficient: Onset time of flooding tests 3-2

Empirical cumulative distribution



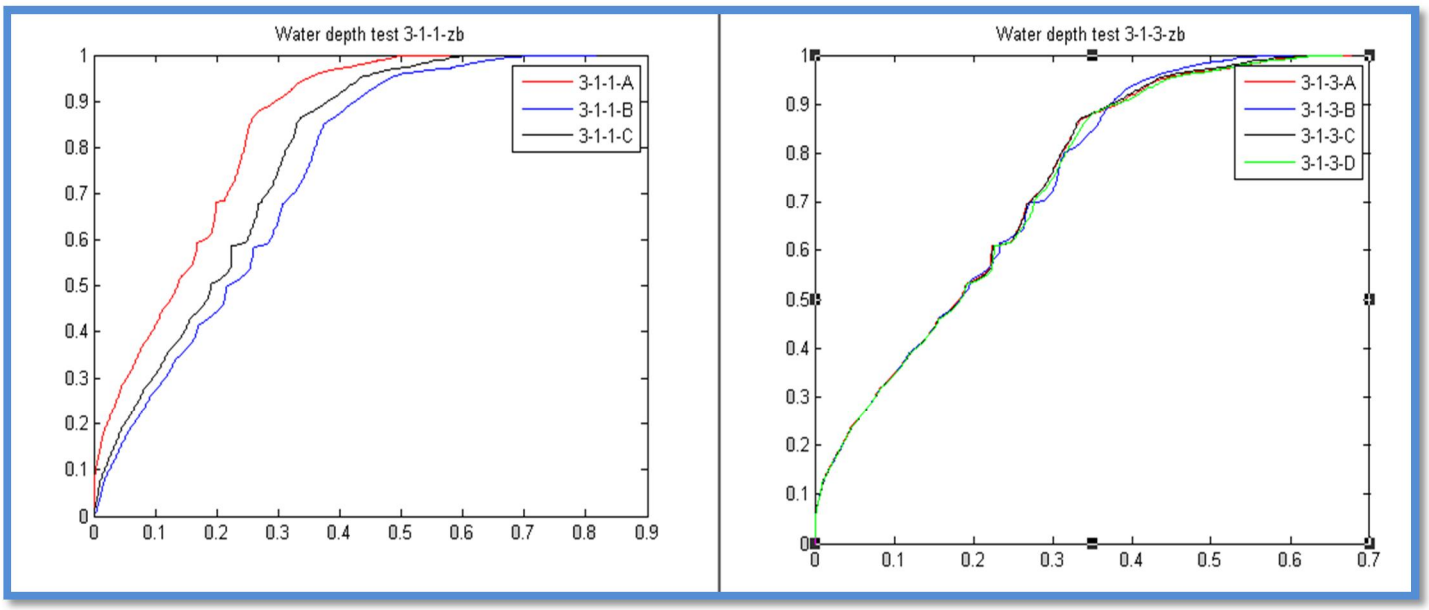




	Test 3-**2** nf		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	77	0.3863	46	0.6486	0.81
test 2-1-B	101	0.4142	70	0.6139	0.63
test 2-1-C	94	0.4092	63	0.6366	0.69
test 2-2-A	112	0.3508	100	0.3097	0.24
test 2-2-B	112	0.3508	100	0.3097	0.24
test 2-2-C	112	0.3508	100	0.3097	0.24
test 2-2-D	112	0.3508	100	0.3097	0.24
test 2-3-A	101	0.3951	67	0.5927	0.67
test 2-3-B	107	0.4142	74	0.6740	0.69
test 2-3-C	101	0.3951	67	0.5927	0.67
test 2-3-D	107	0.4142	74	0.6740	0.69

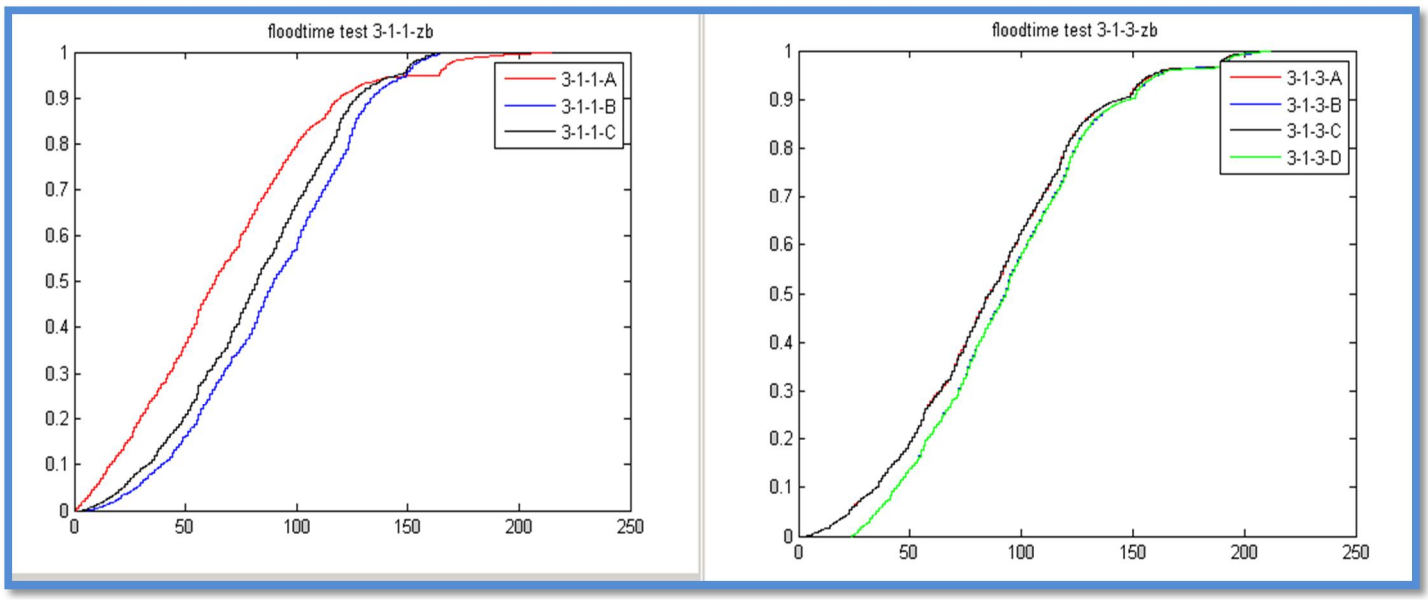
Class C test 3:Bed level of channel: Water depth tests 3-1

Empirical cumulative distribution



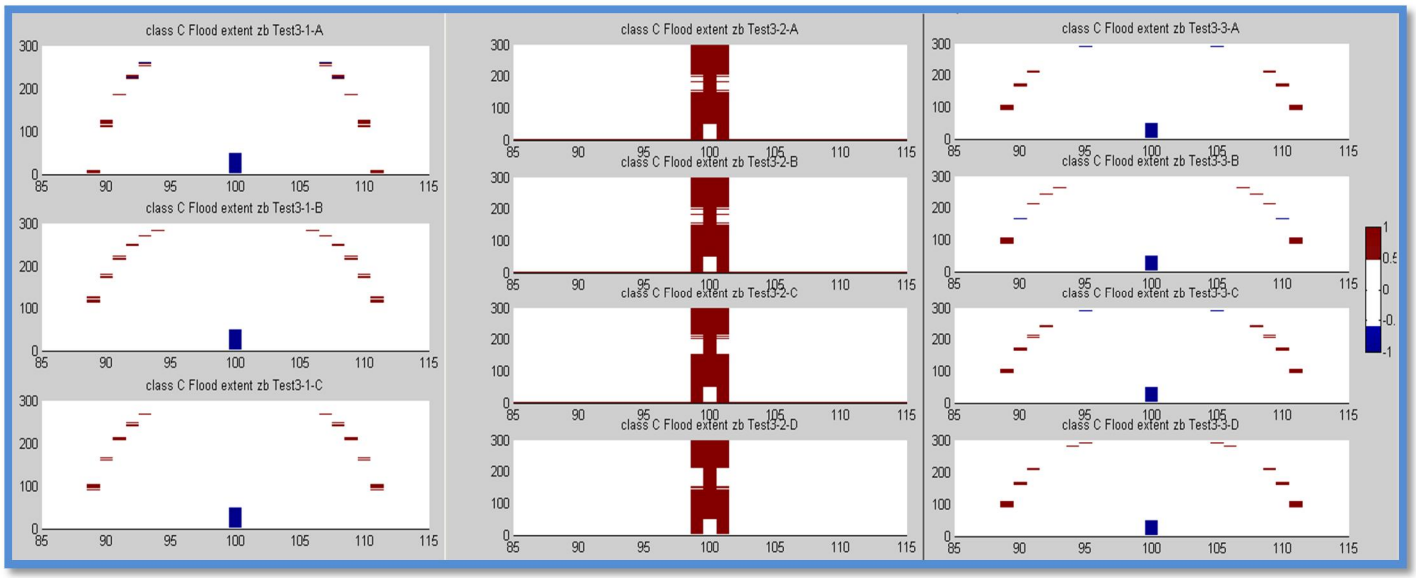
	Test **3** z_b		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**0.1361**	**69.61**	0.1443	68.74	0.07
test 1-1-B	0.2205	63.89	0.2225	63.22	0.02
test 1-1-C	0.1906	66.23	0.1981	67.09	0.05
test 1-2-A	**0**	**0**	0.001	89.14	1
test 1-2-B	0	0	0.001	89.14	1
test 1-2-C	0	0	0.001	89.15	1
test 1-2-D	0	0	0.001	89.18	1
test 1-3-A	**0.183**	**65.16**	0.187	64.41	0.03
test 1-3-B	0.1838	64.99	0.184	64.65	0.01
test 1-3-C	0.1846	65.27	0.187	64.41	0.03
test 1-3-D	0.1846	64.85	0.184	64.65	0.01

Class C test 3:Bed level of channel: Onset time of flooding tests 3-1

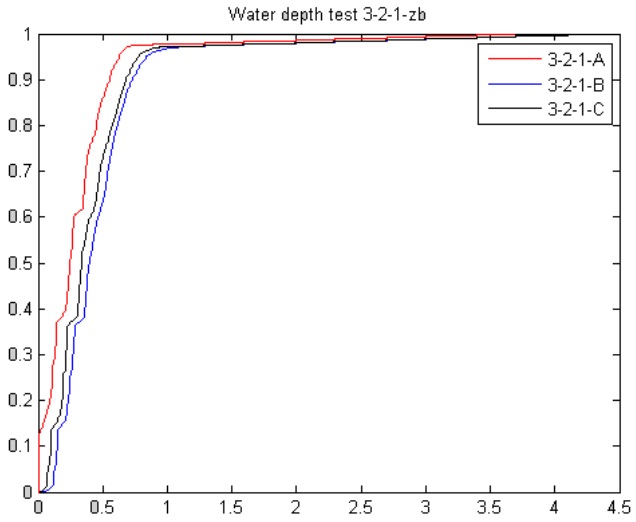


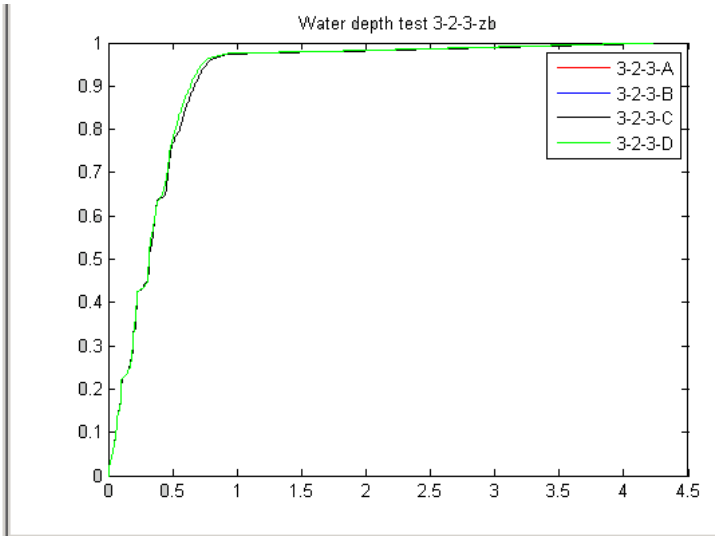
	Test **3** z_b		Test 1		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	**63**	**0.4911**	**60**	**0.477**	0.08
test 1-1-B	90	0.5131	85	0.513	0.06
test 1-1-C	82	0.5131	76	0.430	0.27
test 1-2-A	**0**	**0**	**83**	**0.313**	1
test 1-2-B	0	0	83	0.313	1
test 1-2-C	0	0	80	0.310	1
test 1-2-D	0	0	83	0.315	1
test 1-3-A	**86**	**0.4982**	**81**	**0.458**	0.15
test 1-3-B	93	0.5209	89	0.506	0.07
test 1-3-C	86	0.4982	81	0.458	0.15
test 1-3-D	93	0.5209	89	0.506	0.07

Class C test 3:Bed level of channel: Flood extent tests 3-1



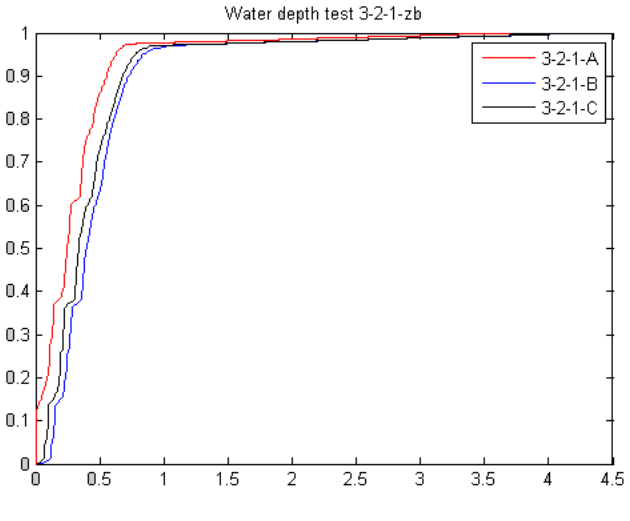
Class C test 3:Bed level of channel: Water depth tests 3-2

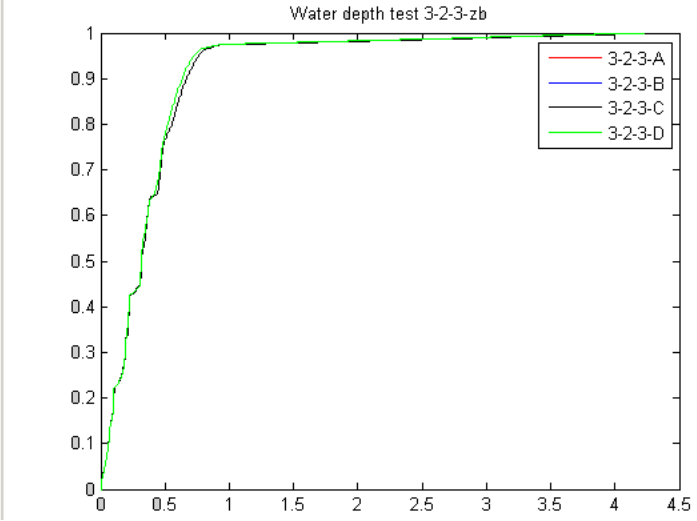




	Test 3-2 z_b		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.2435	59.06	0.2563	57.3	0.08
test 2-1-B	0.3958	57.37	0.3876	56.7	0.03
test 2-1-C	0.3357	57.14	0.3407	57.6	0.02
test 2-2-A	0	0	0.0072	89.0	0
test 2-2-B	0	0	0.0072	89.0	0
test 2-2-C	0	0	0.0072	89.0	0
test 2-2-D	0	0	0.0072	89.0	0
test 2-3-A	0.3183	53.03	0.326	54.2	0.05
test 2-3-B	0.3144	54.88	0.3247	54.1	0.05
test 2-3-C	0.3183	53.03	0.326	54.2	0.05
test 2-3-D	0.3144	54.88	0.3247	54.1	0.05

Class C test 3:Bed level of channel: Onset time of flooding tests 3-2





	Test 3-**2** z_b		Test 2		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	47	0.6486	46	0.6486	0.02
test 2-1-B	72	0.6366	70	0.6139	0.06
test 2-1-C	64	0.6486	63	0.6366	0.03
test 2-2-A	0	0	100	0.3097	1
test 2-2-B	0	0	100	0.3097	1
test 2-2-C	0	0	100	0.3097	1
test 2-2-D	0	0	100	0.3097	1
test 2-3-A	70	0.6139	67	0.5927	0.08
test 2-3-B	78	0.6611	74	0.6740	0.07
test 2-3-C	70	0.6139	67	0.5927	0.08
test 2-3-D	78	0.6611	74	0.6740	0.07

Class DA tests 1. Boundary conditions

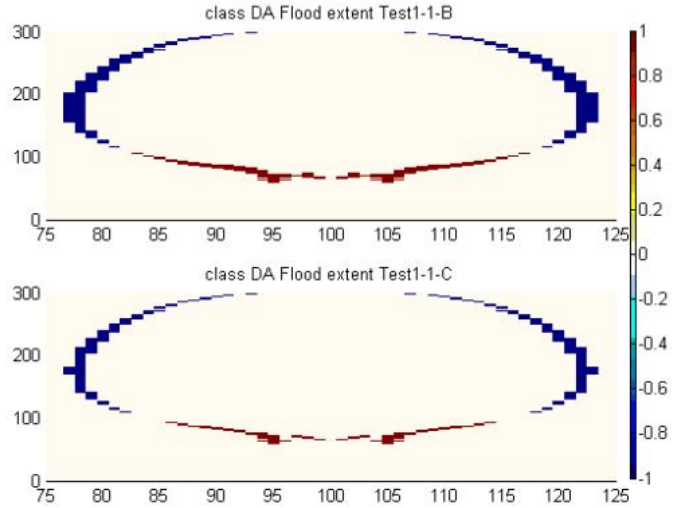
Class DA tests 1Water depth

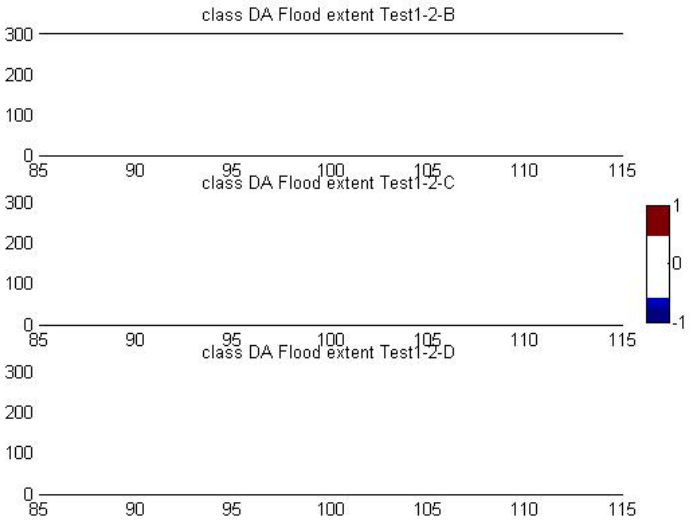
	Test 1-1 class DA		
	Median	Angle	
test 1-1-A	**0.2238**	**70.957**	$F_{difference}$
test 1-1-B	0.3107	66.869	0.446
test 1-1-C	0.2846	68.993	0.299
test 1-2-A	**0.0172**	**87.195**	$F_{difference}$
test 1-2-B	0.0172	87.195	0
test 1-2-C	0.0172	87.195	0
test 1-2-D	0.0172	87.195	0
test 1-3-A	**0.2798**	**67.510**	$F_{difference}$
test 1-3-B	0.2718	65.947	0.052
test 1-3-C	0.28	67.502	0.001
test 1-3-D	0.2718	65.947	0.052

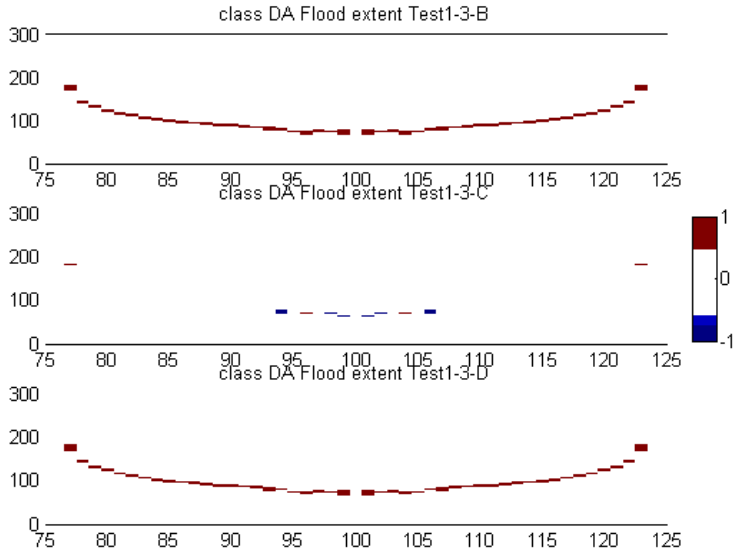
Class DA tests 1Time of flood

	Test 1-1 class DA		
	Median	Angle	
test 1-1-A	**117**	**0.2841**	$F_{difference}$
test 1-1-B	135	0.3274	0.3062
test 1-1-C	128	0.3183	0.2144
test 1-2-A	**113**	**0.2841**	$F_{difference}$
test 1-2-B	113	0.2841	0
test 1-2-C	113	0.2841	0
test 1-2-D	113	0.2841	0
test 1-3-A	**130**	**0.3213**	$F_{difference}$
test 1-3-B	136	0.3274	0.0652
test 1-3-C	130	0.3213	0.0000
test 1-3-D	136	0.3274	0.0652

Class DA tests **1** Flood extent







Class DA tests 2. Slope in perpendicular direction of channel

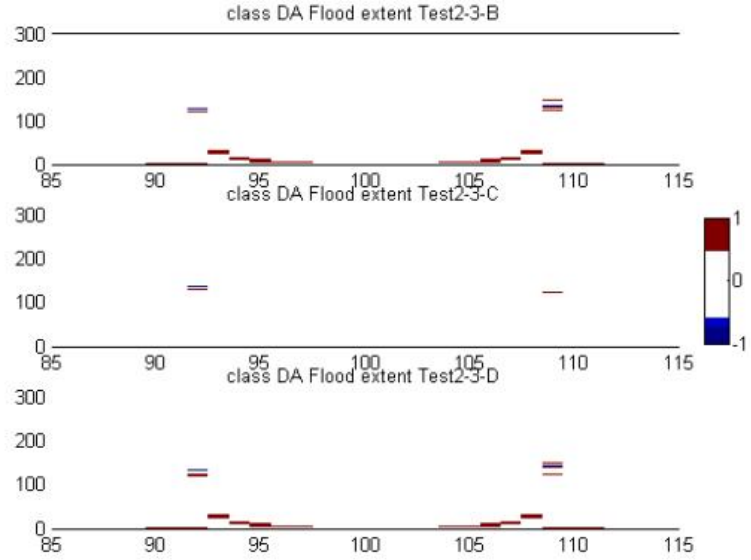
Class DA tests 2:Water depth

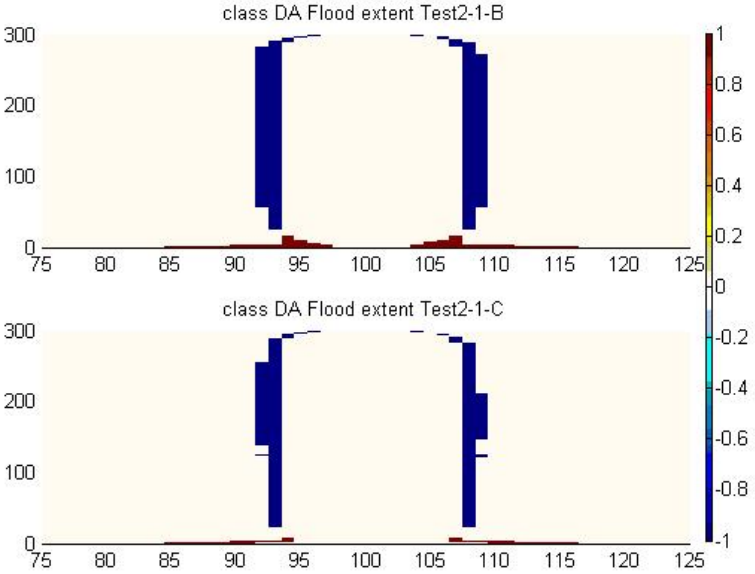
	Test 2-1 class DA		
	Median	Angle	
test 2-1-A	0.3955	56.09	$F_{difference}$
test 2-1-B	0.5547	56.08	0.403
test 2-1-C	0.5144	56.23	0.303
test 2-2-A	0.0697	88.82	$F_{difference}$
test 2-2-B	0.0697	88.62	0.0023
test 2-2-C	0.0697	88.52	0.0033
test 2-2-D	0.0697	88.82	0
test 2-3-A	0.4195	52.16	$F_{difference}$
test 2-3-B	0.4175	50.14	0.044
test 2-3-C	0.4195	52.16	0
test 2-3-D	0.4175	50.13	0.044

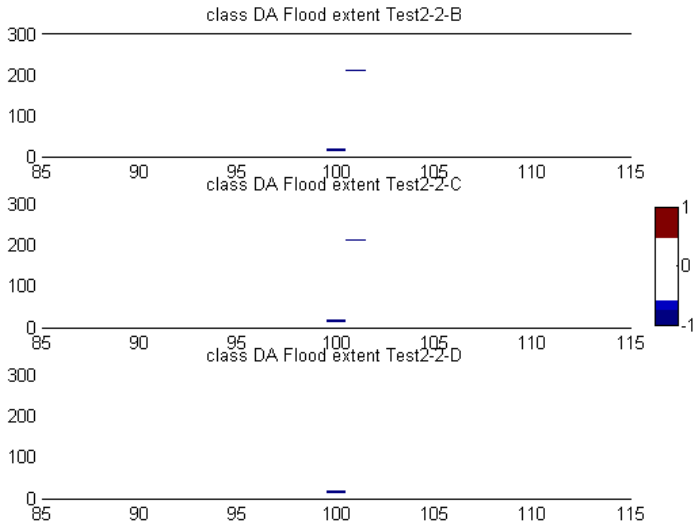
Class DA tests 2:Time of flood

	Test 4-2 class DA		
	Median	Angle	
test 2-1-A	100	0.2865	$F_{difference}$
test 2-1-B	124	0.2989	0.2835
test 2-1-C	116	0.2989	0.2035
test 2-2-A	102	0.2509	$F_{difference}$
test 2-2-B	102	0.2565	0.0224
test 2-2-C	102	0.2565	0.0224
test 2-2-D	102	0.2546	0.0148
test 2-3-A	122	0.3097	$F_{difference}$
test 2-3-B	129	0.3213	0.0948
test 2-3-C	122	0.3125	0.0091
test 2-3-D	129	0.3213	0.0948

Class DA tests 2:Flood extent







Class DA tests 3. Varying parameters

Class DA tests 3:Channel width: Water depth

	Test 3 Bc class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	0.2216	70.565	0.2238	70.957	0.02
test 1-1-B	0.3070	66.291	0.3107	66.869	0.02
test 1-1-C	0.2820	68.496	0.2846	68.993	0.02
test 1-2-A	0.0627	81.320	0.0172	87.195	0.79
test 1-2-B	0.0671	81.469	0.0172	87.195	0.81
test 1-2-C	0.0570	82.255	0.0172	87.195	0.75
test 1-2-D	0.0606	81.965	0.0172	87.195	0.78
test 1-3-A	0.2742	66.853	0.2798	67.510	0.03
test 1-3-B	0.2650	65.321	0.2718	65.947	0.04
test 1-3-C	0.2742	66.845	0.28	67.502	0.03
test 1-3-D	0.2648	65.274	0.2718	65.947	0.04
	Test 3 Bc class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.3911	56.09	0.3955	56.09	0.01
test 2-1-B	0.5518	56.11	0.5547	56.08	0.01
test 2-1-C	0.5103	56.24	0.5144	56.23	0.01
test 2-2-A	0.4589	50.16	0.0697	88.82	1.28
test 2-2-B	0.4505	50.13	0.0697	88.62	1.28
test 2-2-C	0.394	50.19	0.0697	88.52	1.26
test 2-2-D	0.3915	50.20	0.0697	88.82	1.26
test 2-3-A	0.4165	52.36	0.4195	52.16	0.01
test 2-3-B	0.4147	52.08	0.4175	50.14	0.05
test 2-3-C	0.4165	52.41	0.4195	52.16	0.01
test 2-3-D	0.4146	52.08	0.4175	50.13	0.05

Class DA tests 3:Channel width: Time of flood

	Test 3 Bc class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	117	0.2841	117	0.2841	0.00
test 1-1-B	135	0.3305	135	0.3274	0.01
test 1-1-C	128	0.3183	128	0.3183	0.00
test 1-2-A	145	0.2176	113	0.2841	0.45
test 1-2-B	143	0.2218	113	0.2841	0.43
test 1-2-C	127	0.2964	113	0.2841	0.15
test 1-2-D	126	0.3042	113	0.2841	0.17
test 1-3-A	129	0.3213	130	0.3213	0.01
test 1-3-B	135	0.3243	136	0.3274	0.02
test 1-3-C	130	0.3243	130	0.3213	0.01
test 1-3-D	135	0.3305	136	0.3274	0.02
	Test 3 Bc class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$

test 2-1-A	100	0.2889	100	0.2865	0.01
test 2-1-B	124	0.3016	124	0.2989	0.01
test 2-1-C	117	0.3016	116	0.2989	0.02
test 2-2-A	96	0.3581	102	0.2509	0.49
test 2-2-B	94	0.3508	102	0.2565	0.45
test 2-2-C	101	0.4646	102	0.2565	0.82
test 2-2-D	101	0.4709	102	0.2546	0.86
test 2-3-A	120	0.3154	122	0.3097	0.04
test 2-3-B	127	0.3213	129	0.3213	0.02
test 2-3-C	120	0.3154	122	0.3125	0.03
test 2-3-D	126	0.3213	129	0.3213	0.02

Class DA tests 3:Channel roughness coefficient: Water depth

	Test **3** n_c class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	0.2240	71.017	0.2238	70.957	0.00
test 1-1-B	0.3113	66.991	0.3107	66.869	0.00
test 1-1-C	0.2849	69.101	0.2846	68.993	0.00
test 1-2-A	0.0178	87.004	0.0172	87.195	0.04
test 1-2-B	0.0178	87.004	0.0172	87.195	0.04
test 1-2-C	0.0178	87.004	0.0172	87.195	0.04
test 1-2-D	0.0178	87.004	0.0172	87.195	0.04
test 1-3-A	0.2806	67.649	0.2798	67.510	0.00
test 1-3-B	0.2730	66.075	0.2718	65.947	0.01
test 1-3-C	0.2806	67.649	0.28	67.502	0.00
test 1-3-D	0.2719	65.915	0.2718	65.947	0.00
	Test 3 nc class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.397	56.22	0.3955	56.09	0.01
test 2-1-B	0.8178	53.90	0.5547	56.08	0.36
test 2-1-C	0.522	56.15	0.5144	56.23	0.02
test 2-2-A	0.0917	86.83	0.0697	88.82	0.26
test 2-2-B	0.075	89.70	0.0697	88.62	0.08
test 2-2-C	0.075	89.70	0.0697	88.52	0.08
test 2-2-D	0.075	89.70	0.0697	88.82	0.08
test 2-3-A	0.421	49.19	0.4195	52.16	0.06
test 2-3-B	0.4209	49.34	0.4175	50.14	0.02
test 2-3-C	0.421	49.19	0.4195	52.16	0.06
test 2-3-D	0.5331	49.11	0.4175	50.13	0.24

Class DA tests 3:Channel roughness coefficient: Time of flood

	Test **3** n_c class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$

test 1-1-A	117	0.2841	117	0.2841	0.00
test 1-1-B	136	0.3274	135	0.3274	0.01
test 1-1-C	129	0.3154	128	0.3183	0.02
test 1-2-A	116	0.2841	113	0.2841	0.03
test 1-2-B	116	0.2841	113	0.2841	0.03
test 1-2-C	116	0.2841	113	0.2841	0.03
test 1-2-D	116	0.2841	113	0.2841	0.03
test 1-3-A	128	0.3213	130	0.3213	0.02
test 1-3-B	135	0.3274	136	0.3274	0.01
test 1-3-C	130	0.3183	130	0.3213	0.01
test 1-3-D	136	0.3243	136	0.3274	0.01
	Test 3 nc class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	60	0.4775	100	0.2865	1.33
test 2-1-B	123	0.2865	124	0.2989	0.05
test 2-1-C	78	0.4709	116	0.2989	1.06
test 2-2-A	100	0.2624	102	0.2509	0.07
test 2-2-B	86	0.2964	102	0.2565	0.34
test 2-2-C	86	0.2964	102	0.2565	0.34
test 2-2-D	86	0.2964	102	0.2546	0.35
test 2-3-A	103	0.3778	122	0.3097	0.40
test 2-3-B	110	0.3906	129	0.3213	0.39
test 2-3-C	103	0.3778	122	0.3125	0.39
test 2-3-D	126	0.3125	129	0.3213	0.05

Class DA tests 3: Flood plain roughness coefficient: Water depth

	Test **3** n_f class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	0.3512	61.109	0.2238	70.957	0.50
test 1-1-B	0.4785	55.713	0.3107	66.869	0.52
test 1-1-C	0.4429	58.194	0.2846	68.993	0.51
test 1-2-A	0.0106	85.967	0.0172	87.195	0.64
test 1-2-B	0.0105	85.967	0.0172	87.195	0.65
test 1-2-C	0.0105	85.977	0.0172	87.195	0.65
test 1-2-D	0.0105	85.977	0.0172	87.195	0.65
test 1-3-A	0.4280	56.125	0.2798	67.510	0.51
test 1-3-B	0.4162	53.821	0.2718	65.947	0.53
test 1-3-C	0.4280	56.125	0.28	67.502	0.51
test 1-3-D	0.4162	53.821	0.2718	65.947	0.53
	Test 3 nf class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.5166	56.09	0.3955	56.09	0.23
test 2-1-B	0.6941	56.08	0.5547	56.08	0.20
test 2-1-C	0.6251	56.23	0.5144	56.23	0.18

test 2-2-A	0.0077	88.82	0.0697	88.82	8.05
test 2-2-B	0.0077	88.62	0.0697	88.62	8.05
test 2-2-C	0.0069	88.52	0.0697	88.52	9.10
test 2-2-D	0.0069	88.82	0.0697	88.82	9.10
test 2-3-A	0.5973	52.16	0.4195	52.16	0.30
test 2-3-B	0.5885	50.14	0.4175	50.14	0.29
test 2-3-C	0.5973	52.16	0.4195	52.16	0.30
test 2-3-D	0.5885	50.13	0.4175	50.13	0.29

Class DA tests 3: Flood plain roughness coefficient: Time of flood

	Test **3** n_f class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	116	0.2546	117	0.2841	0.11
test 1-1-B	133	0.3338	135	0.3274	0.03
test 1-1-C	124	0.3154	128	0.3183	0.04
test 1-2-A	113	0.2750	113	0.2841	0.03
test 1-2-B	113	0.2750	113	0.2841	0.03
test 1-2-C	113	0.2750	113	0.2841	0.03
test 1-2-D	113	0.2750	113	0.2841	0.03
test 1-3-A	126	0.3154	130	0.3213	0.05
test 1-3-B	135	0.3243	136	0.3274	0.02
test 1-3-C	126	0.3154	130	0.3213	0.05
test 1-3-D	135	0.3243	136	0.3274	0.02
	Test 3 nc class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	107	0.2865	100	0.2865	0.07
test 2-1-B	127	0.2989	124	0.2989	0.02
test 2-1-C	120	0.2989	116	0.2989	0.03
test 2-2-A	97	0.2509	102	0.2509	0.05
test 2-2-B	97	0.2565	102	0.2565	0.05
test 2-2-C	97	0.2565	102	0.2565	0.05
test 2-2-D	97	0.2546	102	0.2546	0.05
test 2-3-A	123	0.3097	122	0.3097	0.01
test 2-3-B	129	0.3213	129	0.3213	0.00
test 2-3-C	124	0.3125	122	0.3125	0.02
test 2-3-D	129	0.3213	129	0.3213	0.00

Class DA tests 3: Bed level of channel: Water depth

	Test **3** z_b class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	0.2249	71.308	0.2238	70.957	0.01
test 1-1-B	0.3111	67.510	0.3107	66.869	0.01
test 1-1-C	0.2835	69.586	0.2846	68.993	0.01
test 1-2-A	0	0	0.0172	87.195	0

test 1-2-B	0	0	0.0172	87.195	0
test 1-2-C	0	0	0.0172	87.195	0
test 1-2-D	0	0	0.0172	87.195	0
test 1-3-A	0.2778	67.666	0.2798	67.510	0.01
test 1-3-B	0.2709	66.171	0.2718	65.947	0.01
test 1-3-C	0.2778	67.649	0.28	67.502	0.01
test 1-3-D	0.2705	66.115	0.2718	65.947	0.01
	Test 3 zb class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	0.3878	56.09	0.3955	56.09	0.02
test 2-1-B	0.5493	56.05	0.5547	56.08	0.01
test 2-1-C	0.5074	56.24	0.5144	56.23	0.01
test 2-2-A	0	0	0.0697	88.82	1
test 2-2-B	0	0	0.0697	88.62	1
test 2-2-C	0	0	0.0697	88.52	1
test 2-2-D	0	0	0.0697	88.82	1
test 2-3-A	0.4149	52.13	0.4195	52.16	0.01
test 2-3-B	0.4129	52.87	0.4175	50.14	0.07
test 2-3-C	0.4148	52.13	0.4195	52.16	0.01
test 2-3-D	0.4129	52.94	0.4175	50.13	0.07

Class DA tests 3: Bed level of channel: Time of flood

	Test **3** z_b class DA		Test 1 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 1-1-A	117	0.2818	117	0.2841	0.01
test 1-1-B	135	0.3305	135	0.3274	0.01
test 1-1-C	129	0.3183	128	0.3183	0.01
test 1-2-A	0	0	113	0.2841	0.10
test 1-2-B	0	0	113	0.2841	0.09
test 1-2-C	0	0	113	0.2841	0.25
test 1-2-D	0	0	113	0.2841	0.26
test 1-3-A	130	0.3213	130	0.3213	0
test 1-3-B	136	0.3305	136	0.3274	0.01
test 1-3-C	130	0.3213	130	0.3213	0
test 1-3-D	136	0.3274	136	0.3274	0
	Test 3 zb class DA		Test 2 class DA		
	Median	Angle	Median	Angle	$F_{difference}$
test 2-1-A	101	0.2841	100	0.2865	0.02
test 2-1-B	125	0.3042	124	0.2989	0.03
test 2-1-C	117	0.2989	116	0.2989	0.01
test 2-2-A	0	0	102	0.2509	1
test 2-2-B	0	0	102	0.2565	1
test 2-2-C	0	0	102	0.2565	1
test 2-2-D	0	0	102	0.2546	1
test 2-3-A	119	0.3154	122	0.3097	0.04

test 2-3-B	126	0.3213	129	0.3213	0.02
test 2-3-C	119	0.3154	122	0.3125	0.03
test 2-3-D	125	0.3213	129	0.3213	0.03

V. Flood maps 2011 Thailand flood event

In this section the flood images from satellites processed by ArcGIS are presented.

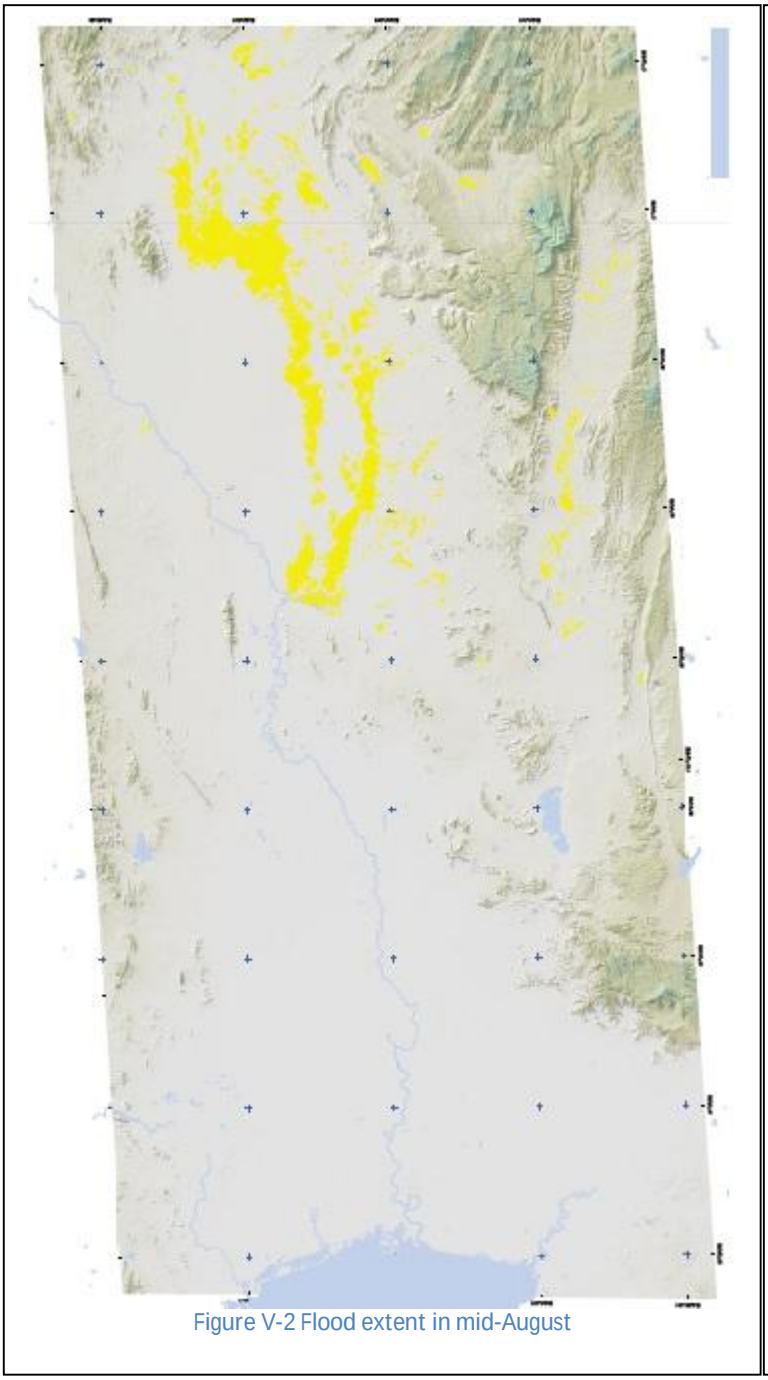


Figure V-2 Flood extent in mid-August

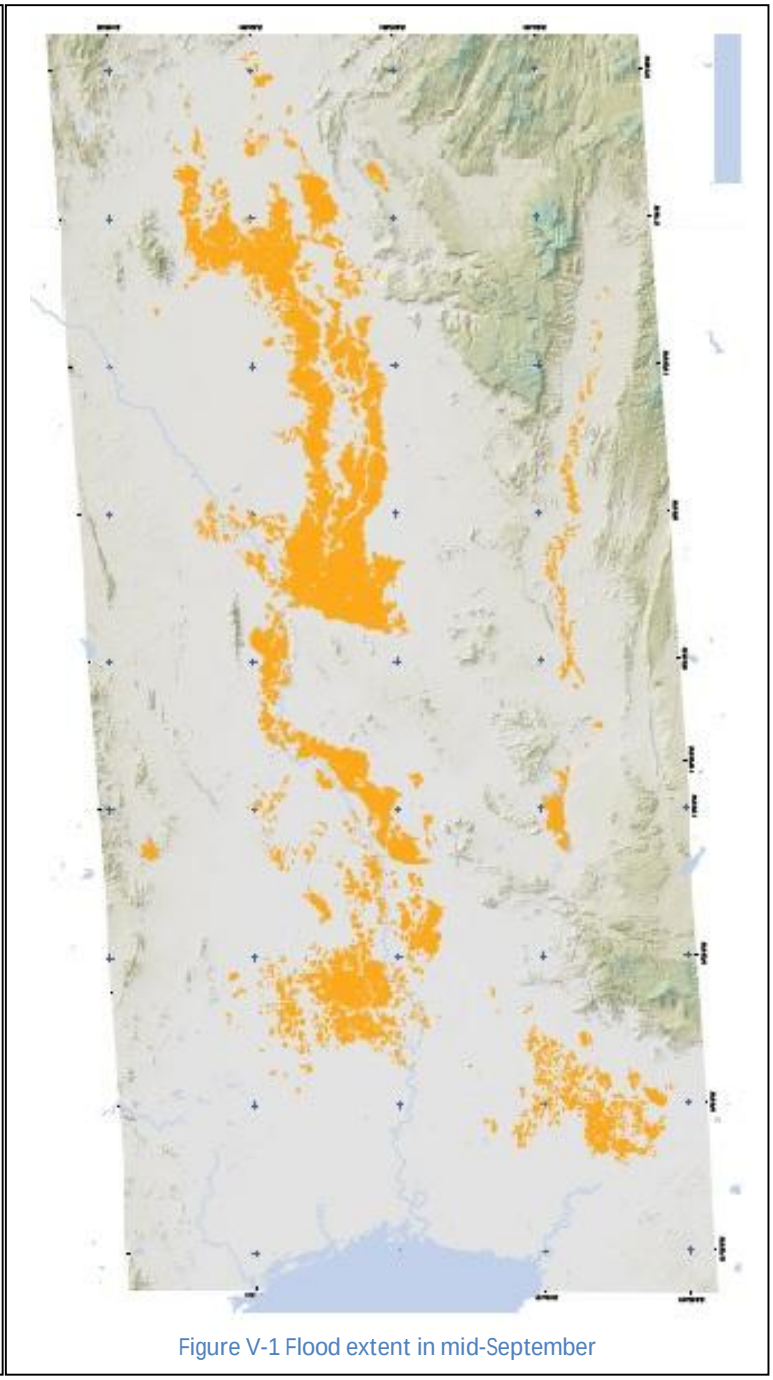


Figure V-1 Flood extent in mid-September

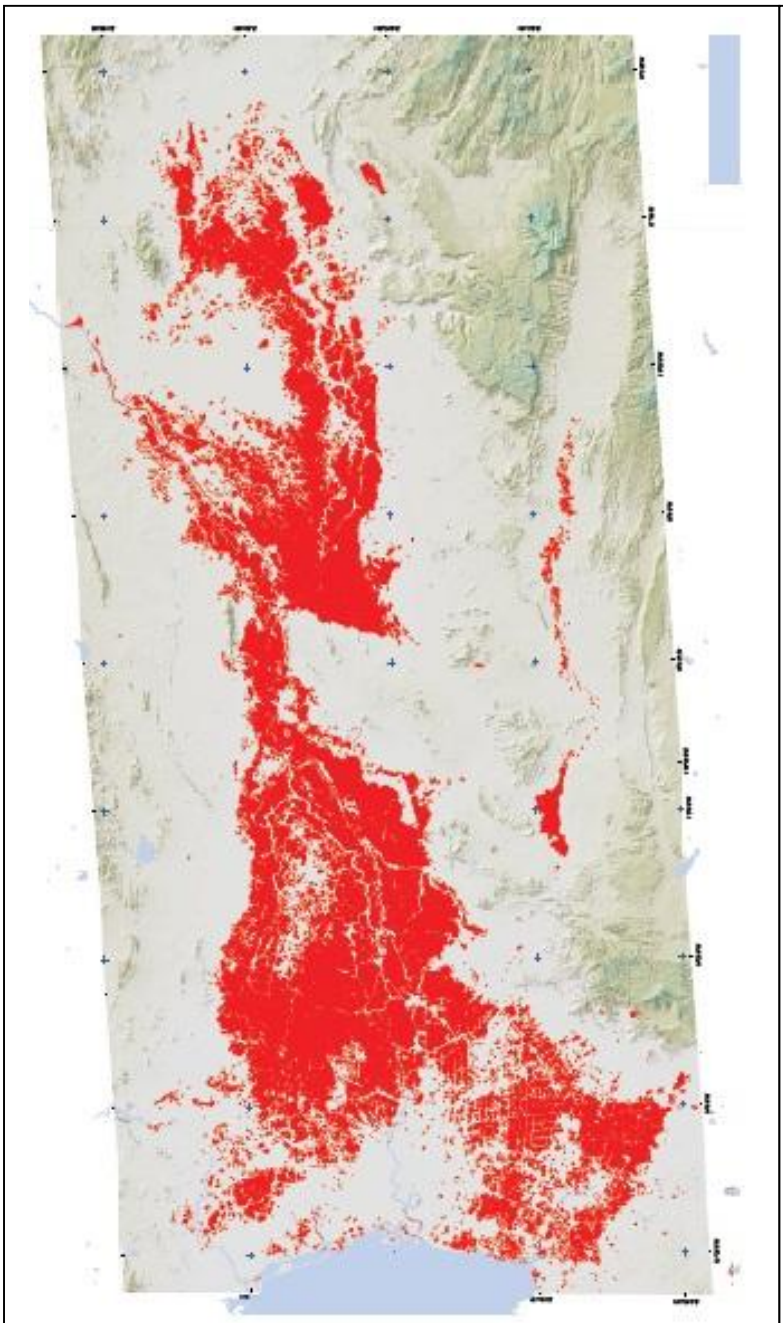


Figure V-4 Flood extent in mid-October

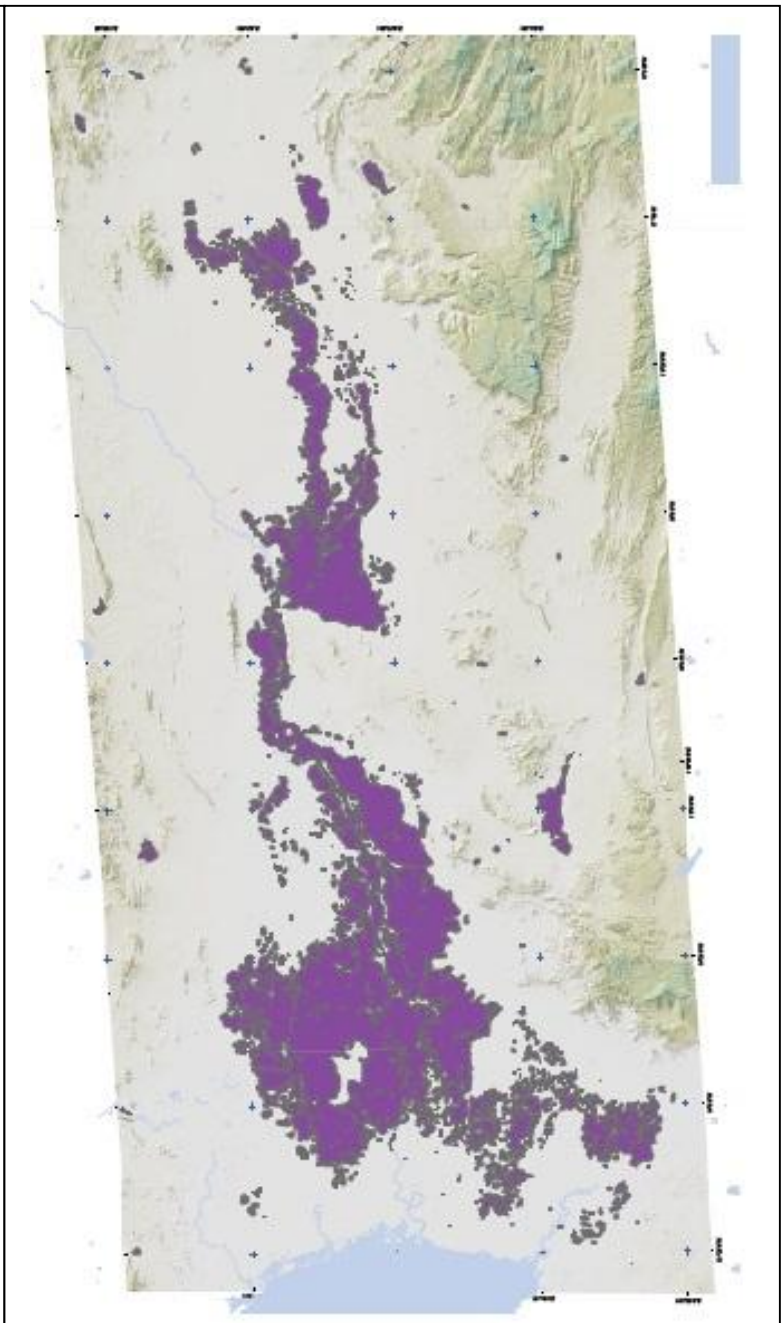


Figure V-3 Flood extent in mid-November

VI. Discharges for points

In this section the discharges for the simulation period of the rapid model and the calibrated and validated Deltares model are given.

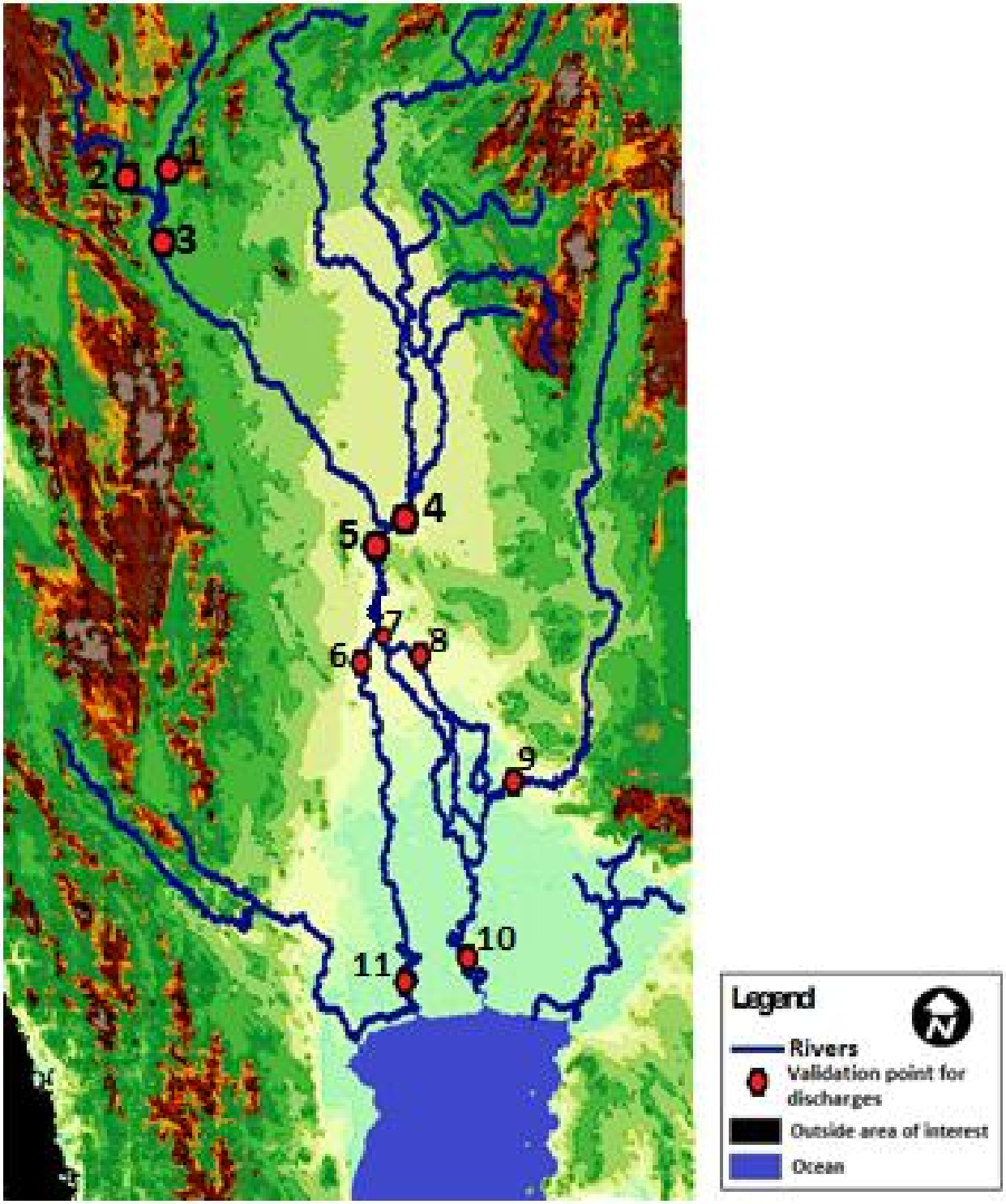
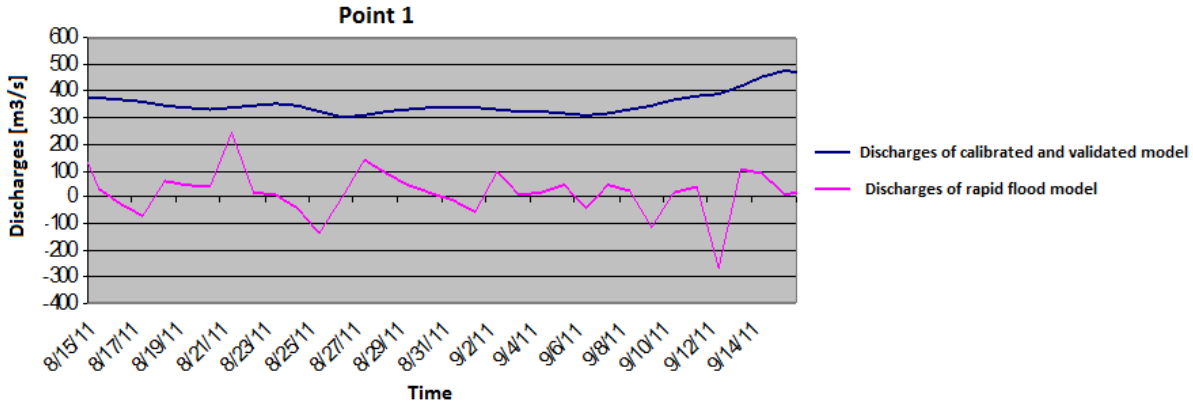
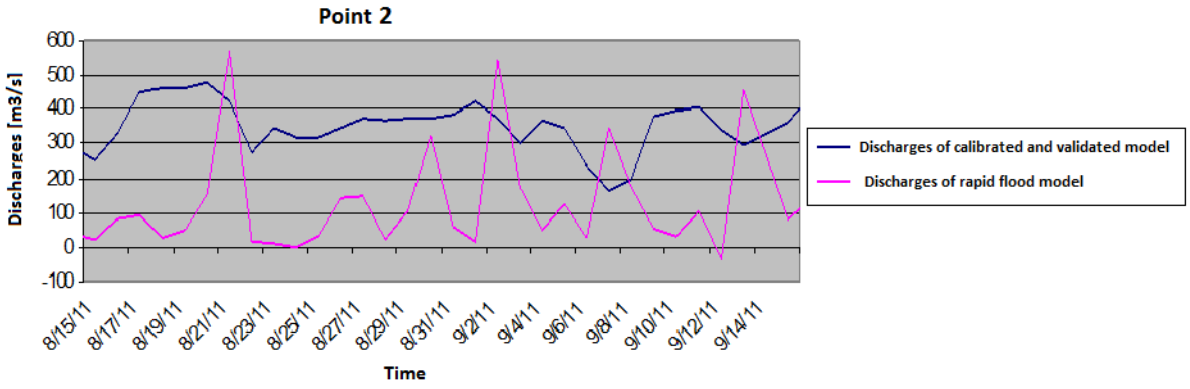
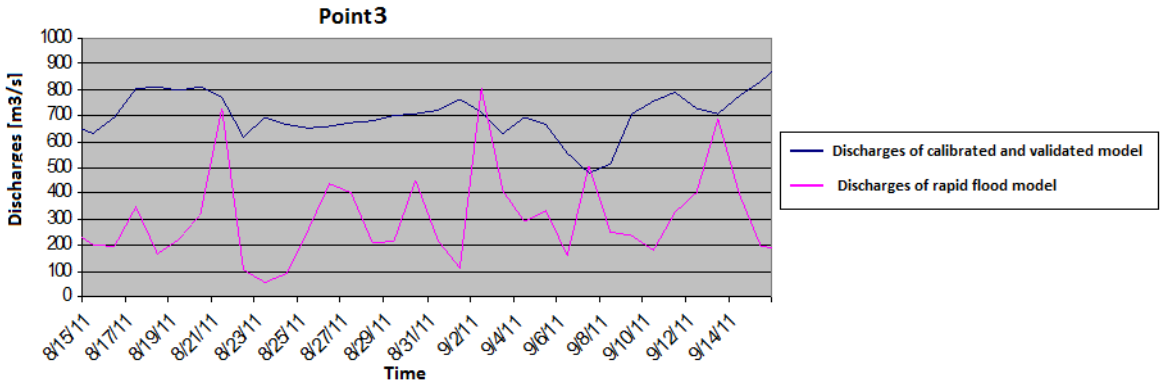


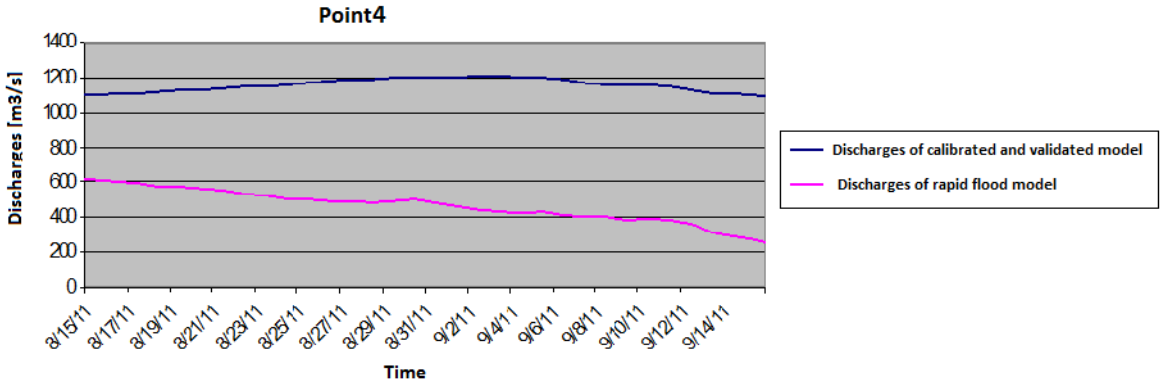
Figure VI-1 Discharge points

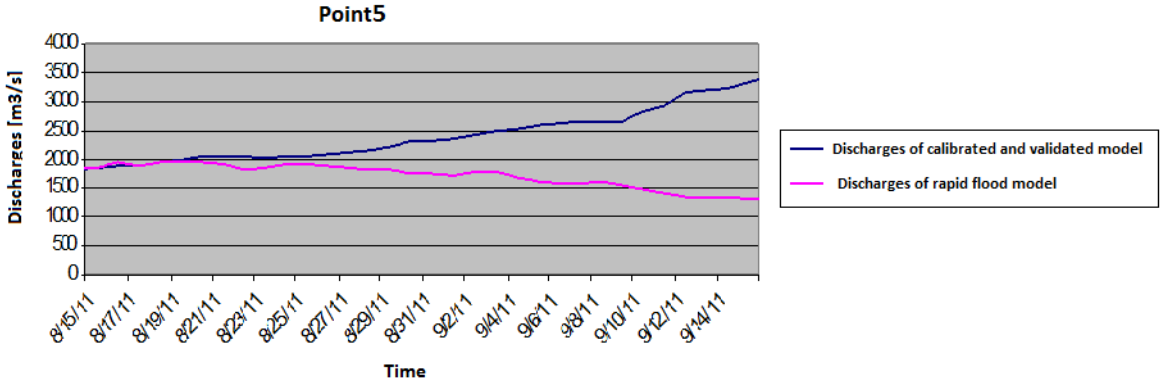
Mid-September

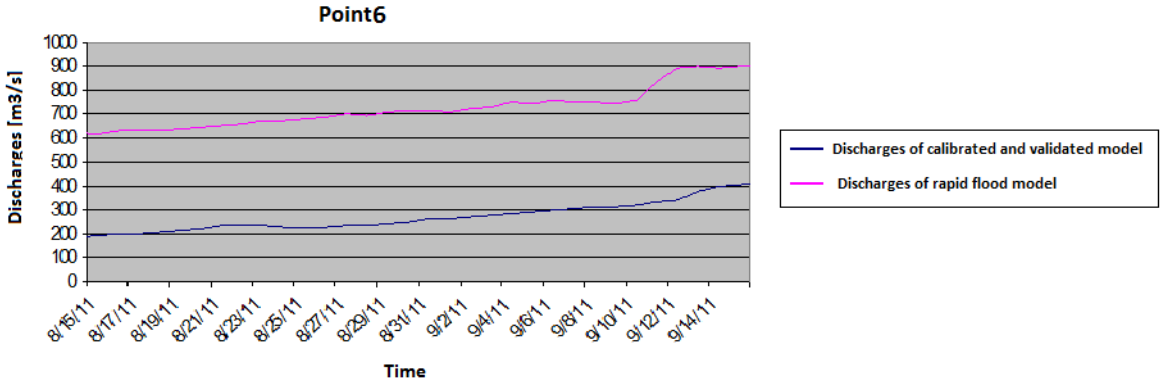


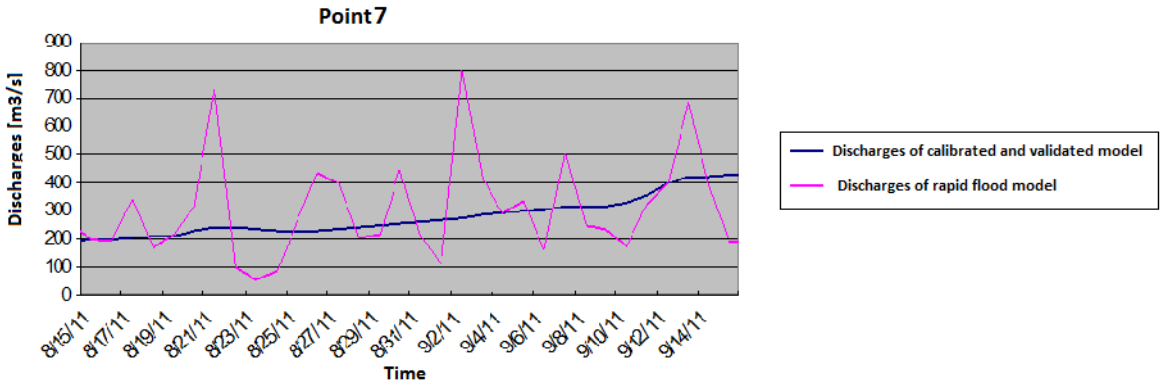


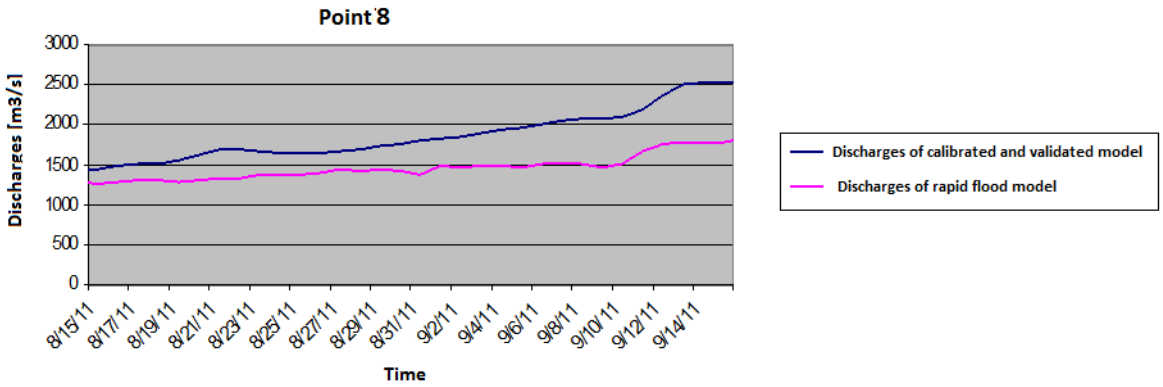


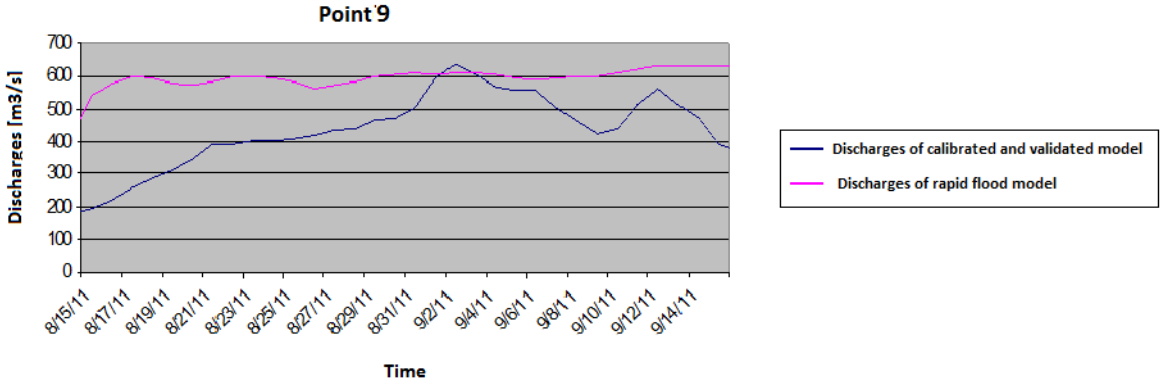


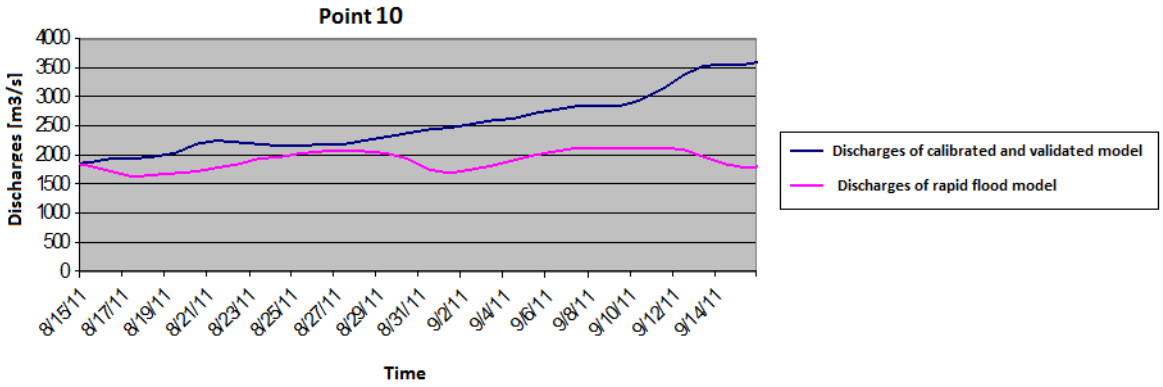

Point5
Discharges [m3/s]
4000
3500
3000
2500
2000
1500
1000
500
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

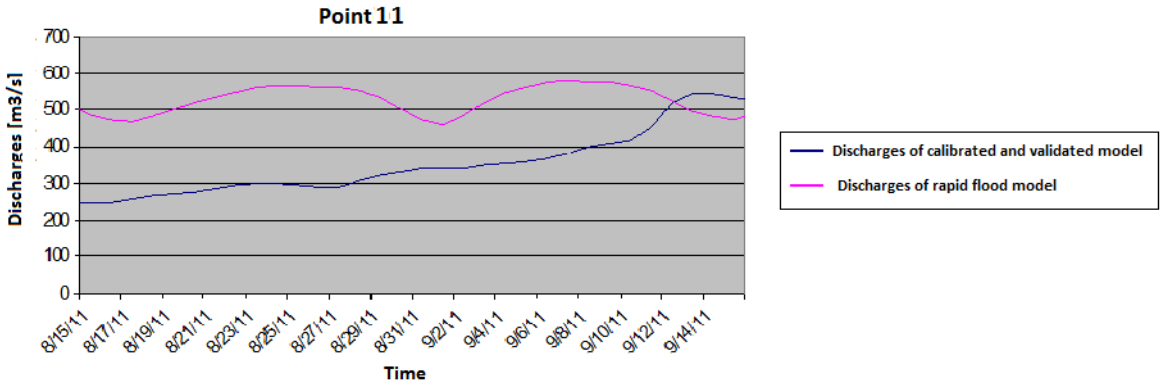

Point6
Discharges [m3/s]
1000
900
800
700
600
500
400
300
200
100
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point7
Discharges [m3/s]
900
800
700
600
500
400
300
200
100
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

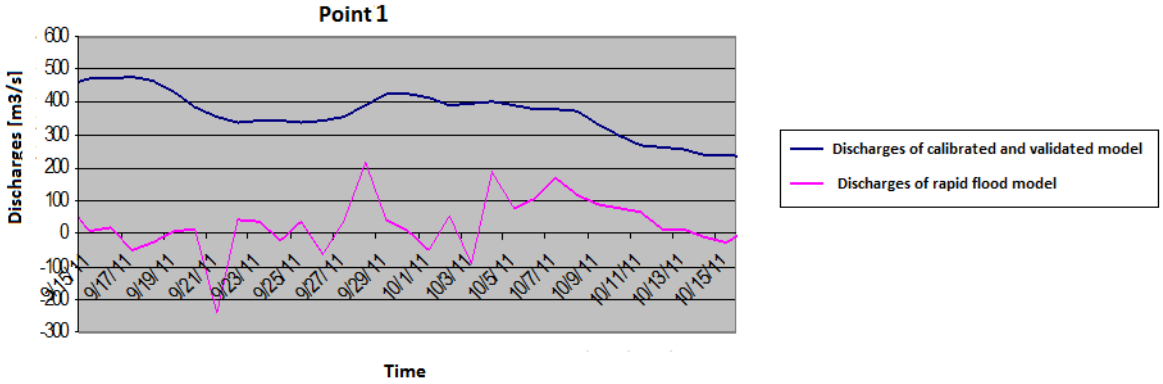

Point8
Discharges [m3/s]
3000
2500
2000
1500
1000
500
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

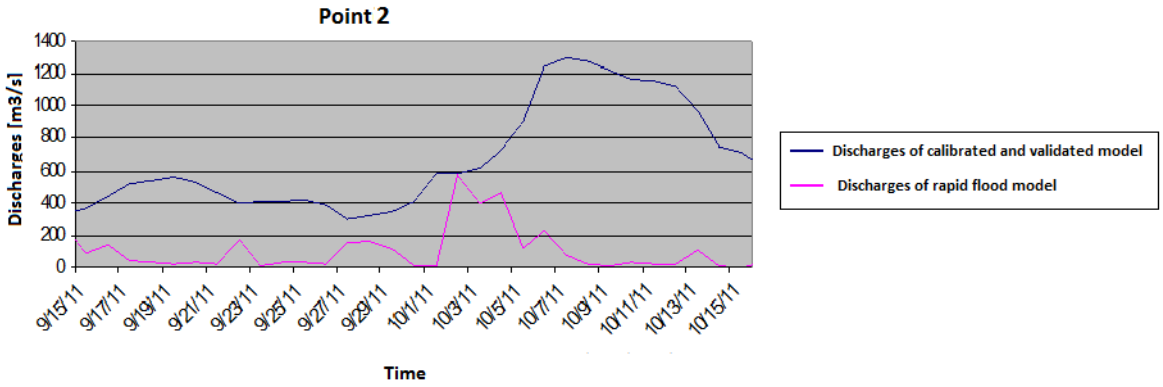

Point 9
Discharges [m3/s]
700
600
500
400
300
200
100
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

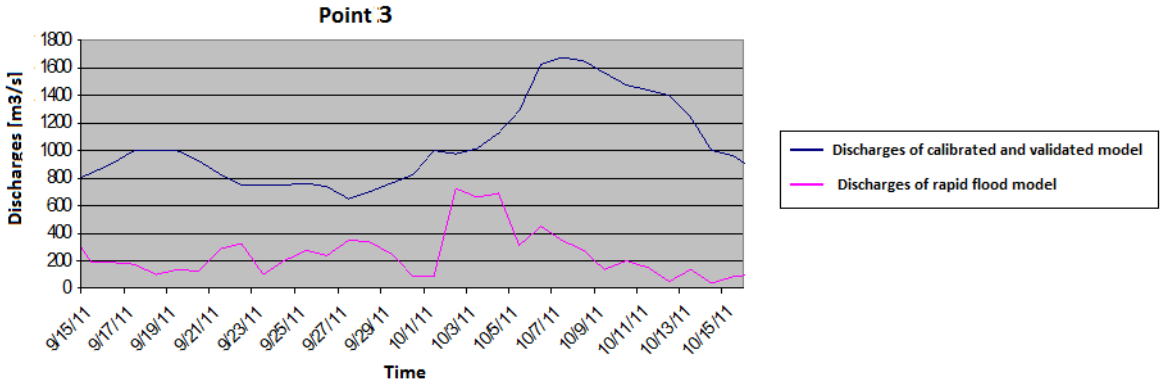

Point 10
Discharges [m3/s]
4000
3500
3000
2500
2000
1500
1000
500
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

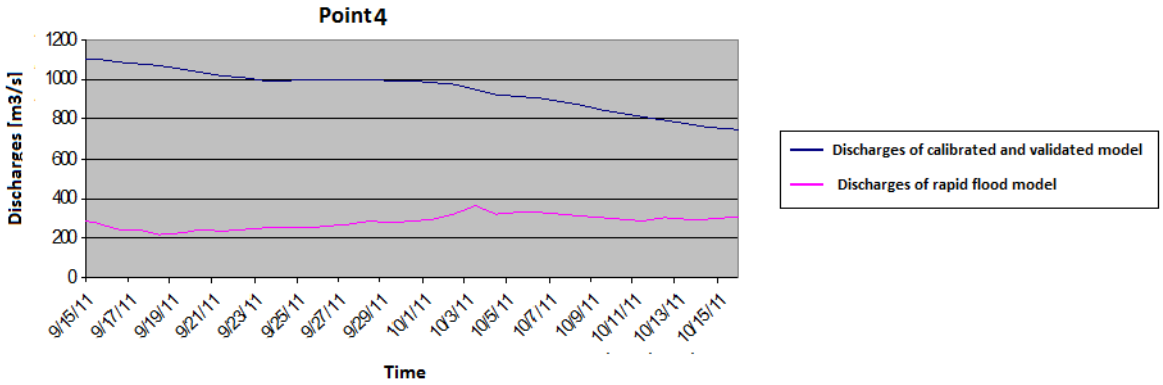

Point 11
Discharges [m3/s]
700
600
500
400
300
200
100
0
8/15/11
8/17/11
8/19/11
8/21/11
8/23/11
8/25/11
8/27/11
8/29/11
8/31/11
9/2/11
9/4/11
9/6/11
9/8/11
9/10/11
9/12/11
9/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

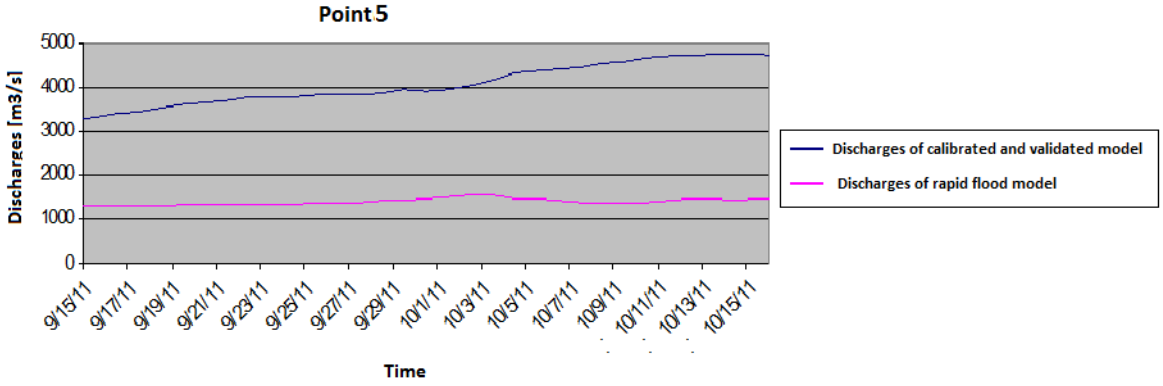
Mid October

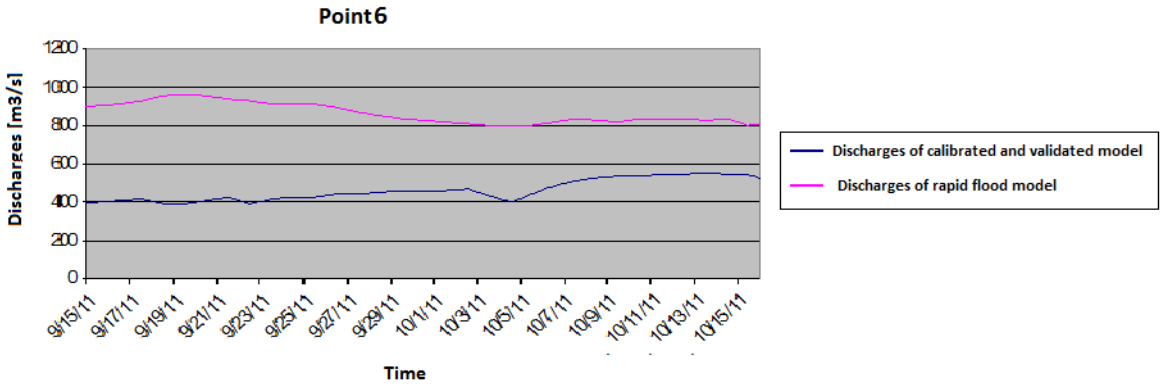

Point 1
Discharges [m3/s]
600
500
400
300
200
100
0
-100
-200
-300
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

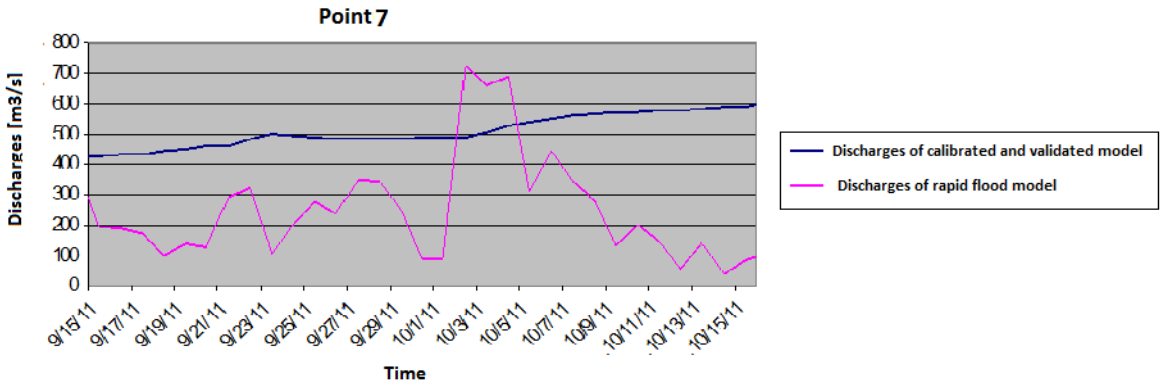

Point 2
Discharges [m3/s]
1400
1200
1000
800
600
400
200
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

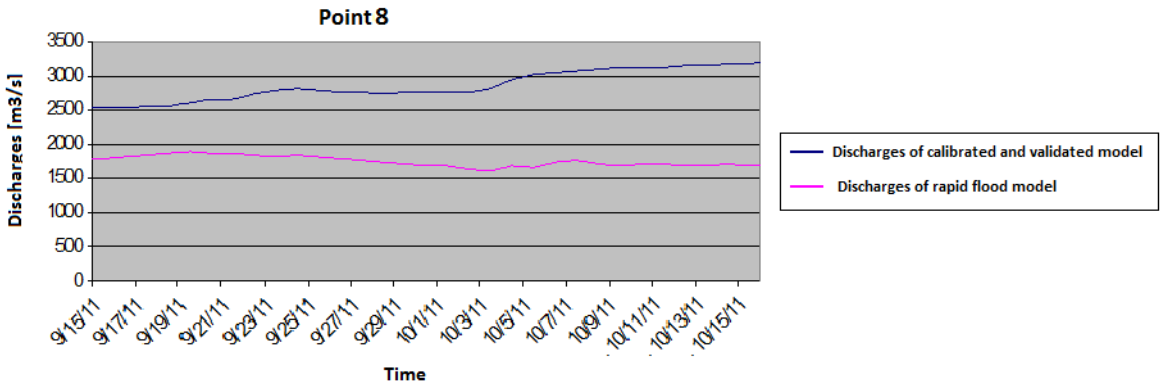

Point 3
Discharges [m3/s]
1800
1600
1400
1200
1000
800
600
400
200
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

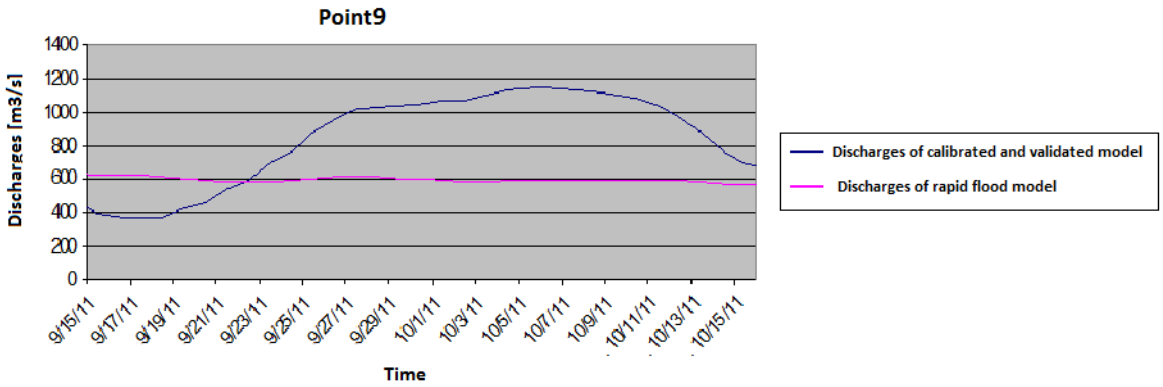

Point 4
Discharges [m3/s]
1200
1000
800
600
400
200
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

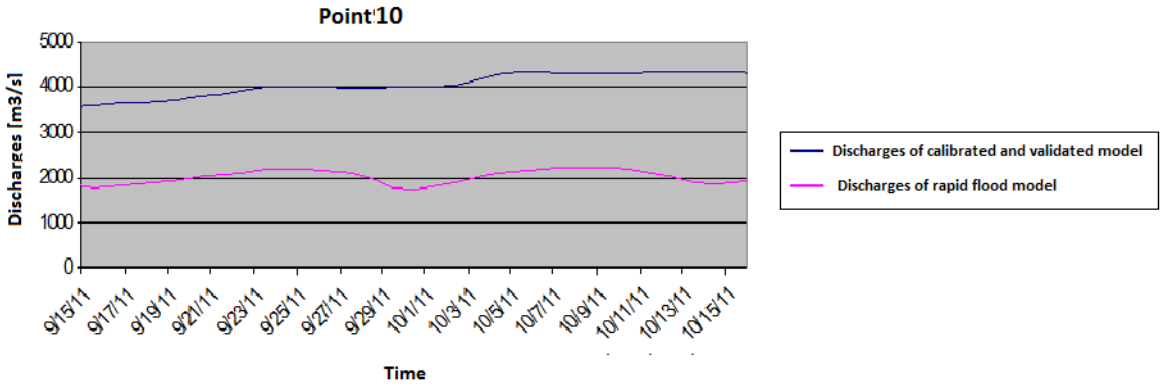

Point 5
Discharges [m3/s]
5000
4000
3000
2000
1000
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

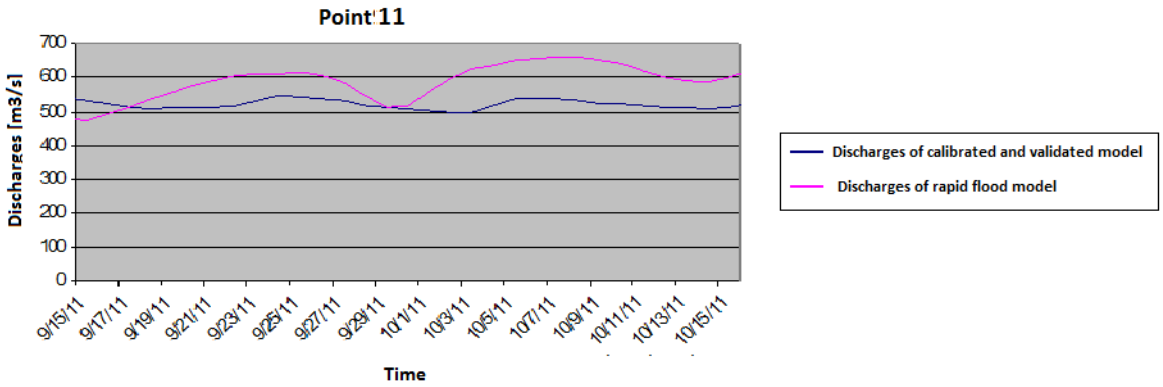

Point 6
Discharges [m3/s]
1200
1000
800
600
400
200
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point 7
Discharges [m3/s]
800
700
600
500
400
300
200
100
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

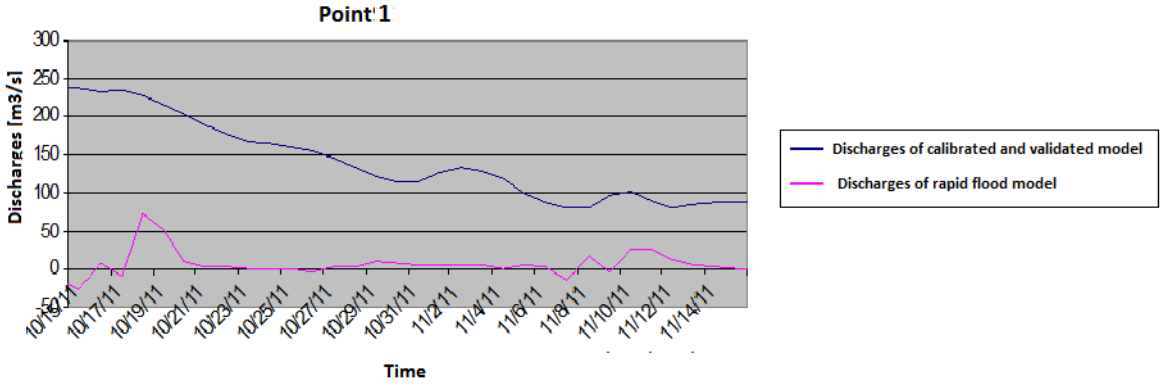

Point 8
Discharges [m3/s]
3500
3000
2500
2000
1500
1000
500
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

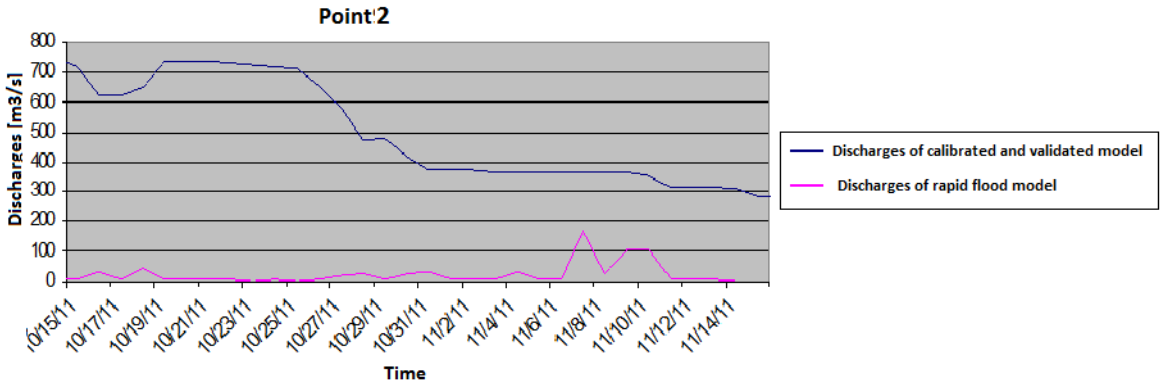

Point9
Discharges [m3/s]
1400
1200
1000
800
600
400
200
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

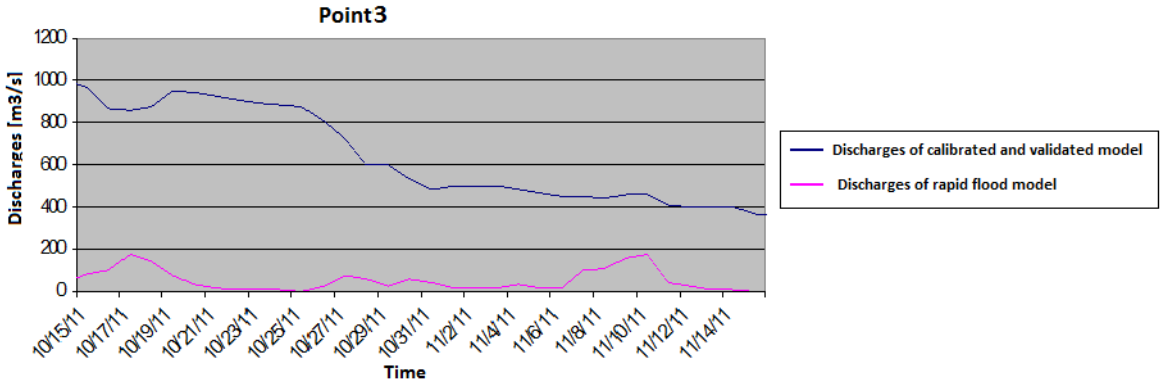

Point10
Discharges [m3/s]
5000
4000
3000
2000
1000
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

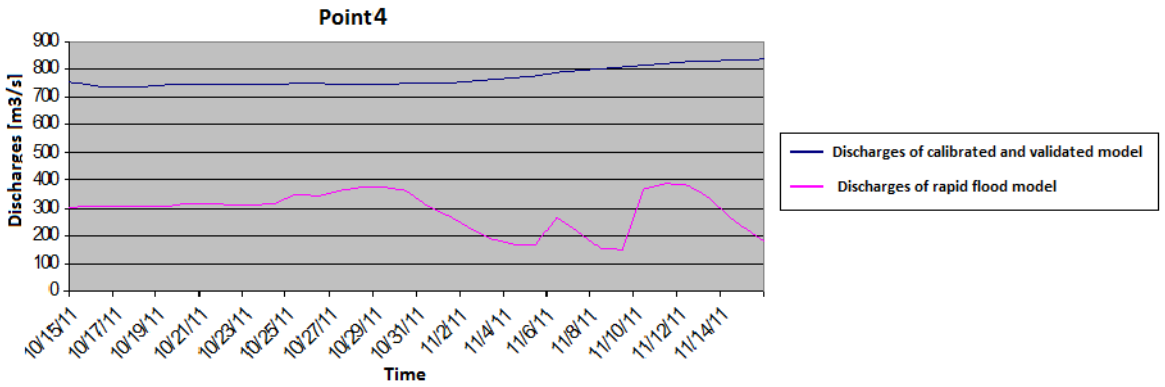

Point11
Discharges [m3/s]
700
600
500
400
300
200
100
0
9/15/11
9/17/11
9/19/11
9/21/11
9/23/11
9/25/11
9/27/11
9/29/11
10/1/11
10/3/11
10/5/11
10/7/11
10/9/11
10/11/11
10/13/11
10/15/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

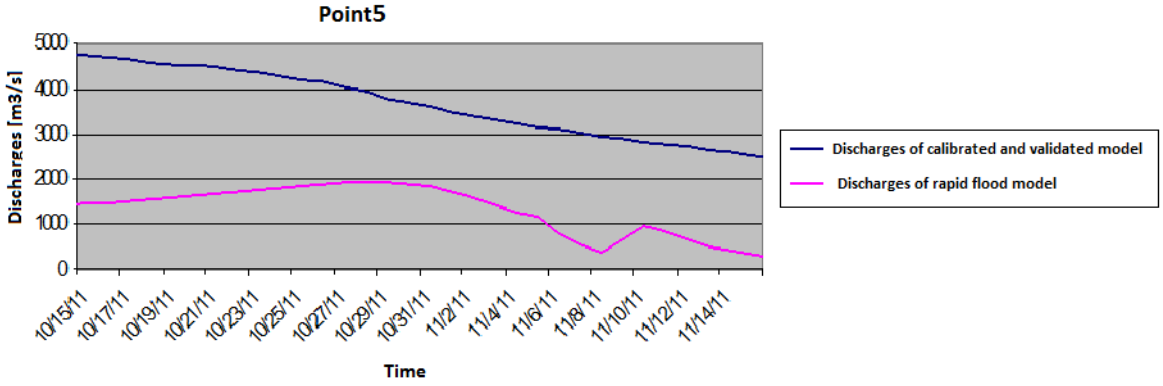
Mid November

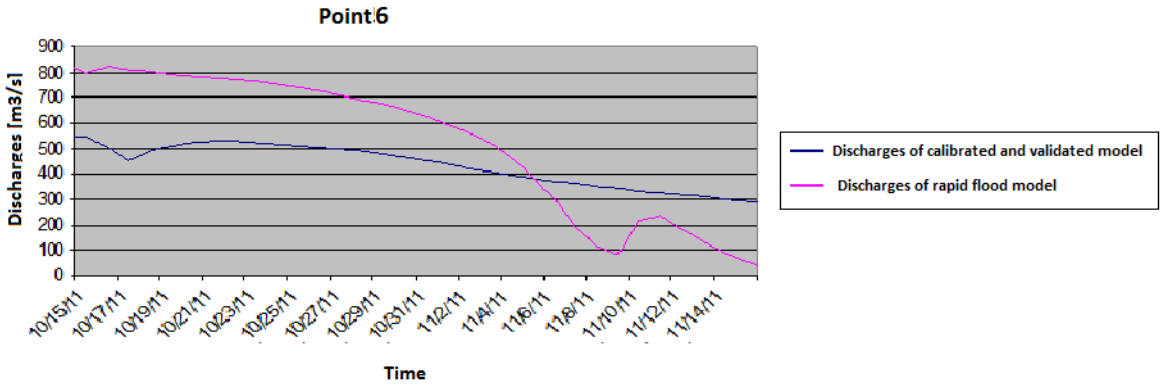


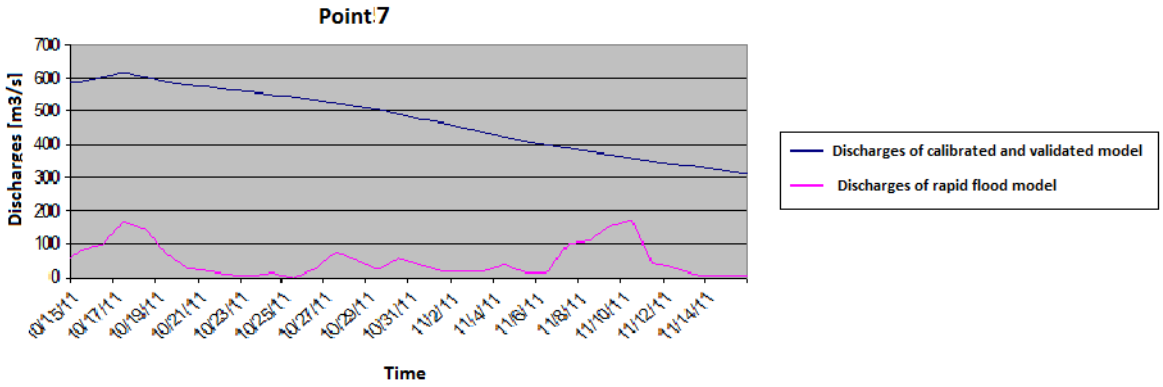


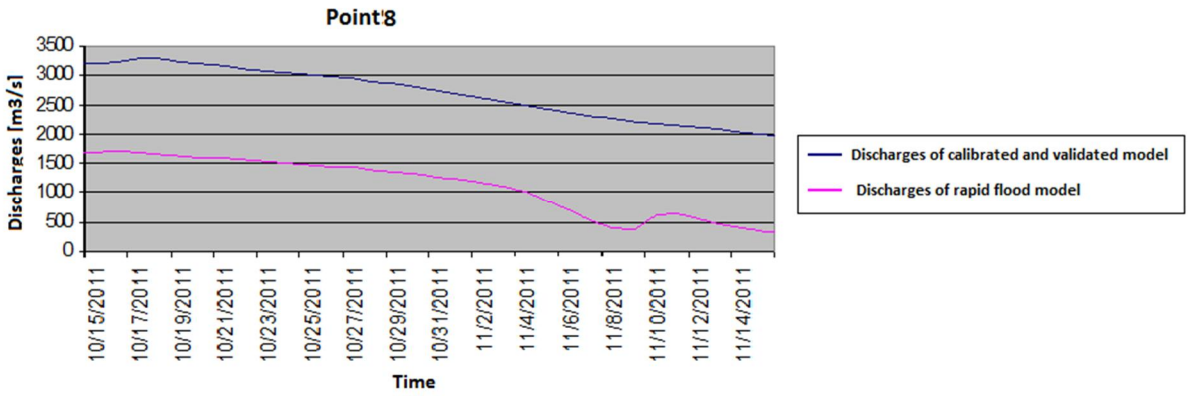


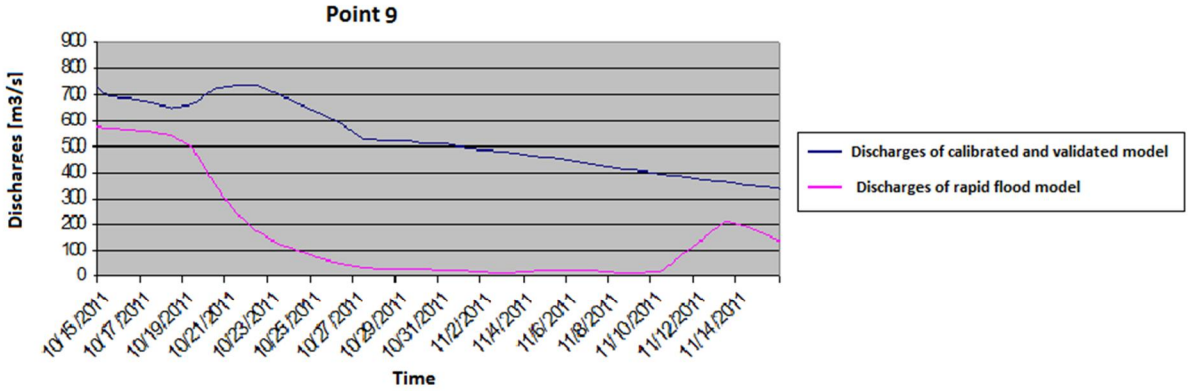


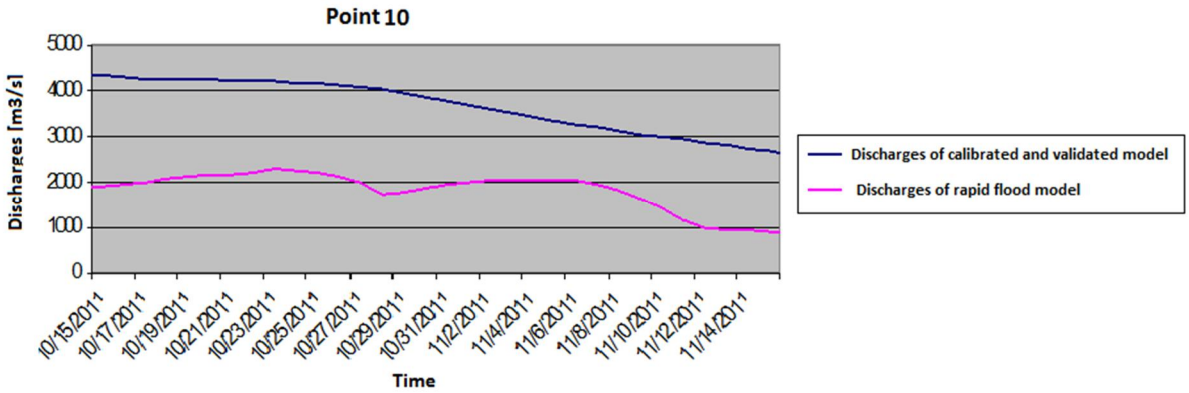

Point5
Discharges [m3/s]
5000
4000
3000
2000
1000
0
10/15/11
10/17/11
10/19/11
10/21/11
10/23/11
10/25/11
10/27/11
10/29/11
10/31/11
11/2/11
11/4/11
11/6/11
11/8/11
11/10/11
11/12/11
11/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model

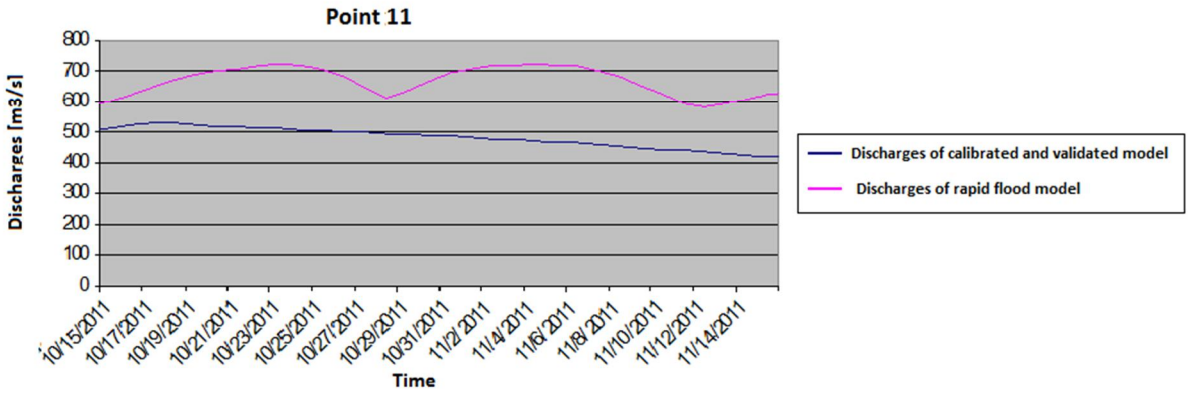

Point6
Discharges [m3/s]
900
800
700
600
500
400
300
200
100
0
10/15/11
10/17/11
10/19/11
10/21/11
10/23/11
10/25/11
10/27/11
10/29/11
10/31/11
11/2/11
11/4/11
11/6/11
11/8/11
11/10/11
11/12/11
11/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point7
Discharges [m3/s]
700
600
500
400
300
200
100
0
10/15/11
10/17/11
10/19/11
10/21/11
10/23/11
10/25/11
10/27/11
10/29/11
10/31/11
11/2/11
11/4/11
11/6/11
11/8/11
11/10/11
11/12/11
11/14/11
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point8
Discharges [m3/s]
3500
3000
2500
2000
1500
1000
500
0
10/15/2011
10/17/2011
10/19/2011
10/21/2011
10/23/2011
10/25/2011
10/27/2011
10/29/2011
10/31/2011
11/2/2011
11/4/2011
11/6/2011
11/8/2011
11/10/2011
11/12/2011
11/14/2011
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point 9
Discharges [m3/s]
900
800
700
600
500
400
300
200
100
0
10/15/2011
10/17/2011
10/19/2011
10/21/2011
10/23/2011
10/25/2011
10/27/2011
10/29/2011
10/31/2011
11/2/2011
11/4/2011
11/6/2011
11/8/2011
11/10/2011
11/12/2011
11/14/2011
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point 10
Discharges [m3/s]
5000
4000
3000
2000
1000
0
10/15/2011
10/17/2011
10/19/2011
10/21/2011
10/23/2011
10/25/2011
10/27/2011
10/29/2011
10/31/2011
11/2/2011
11/4/2011
11/6/2011
11/8/2011
11/10/2011
11/12/2011
11/14/2011
Time
Discharges of calibrated and validated model
Discharges of rapid flood model


Point 11
Discharges [m3/s]
800
700
600
500
400
300
200
100
0
10/15/2011
10/17/2011
10/19/2011
10/21/2011
10/23/2011
10/25/2011
10/27/2011
10/29/2011
10/31/2011
11/2/2011
11/4/2011
11/6/2011
11/8/2011
11/10/2011
11/12/2011
11/14/2011
Time
Discharges of calibrated and validated model
Discharges of rapid flood model