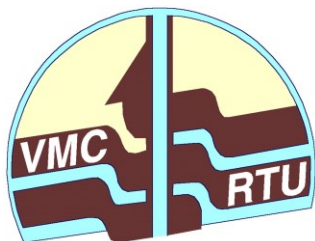


Rīgas Tehniskā universitāte



VIDES MODELĒŠANAS CENTRS

*Latvijas hidroģeoloģiskā modeļa LAMO4 piesaistīto
upju pazemes ūdens pieteces plūsmu katalogs*

Valsts pētījumu programma EVIDEnT
„Latvijas hidroģeoloģiskā modeļa LAMO pilnveidošana”
1. sējums

Rīga - Novembris, 2016

Katalogs „Latvijas hidroģeoloģiskā modeļa LAMO4 piesaistīto upju pazemes ūdens pieteces plūsmu katalogs”

LAMO pilnveidošanu RTU īsteno Valsts Pētījumu Programmas (VPP) projektā EVIDEnT. „Pilnveidot laba ūdens stāvokļa un tā ilgtspējīgai izmantošanai Latvijas hidroģeoloģisko modeli ar datiem un funkcijām, kas apraksta pazemes ūdeņu mijiedarbību ar hidroģeoloģisko tīklu (upes, ezeri)”.

Katalogs izveidots balstoties uz aprēķiniem, kuri veikti LAMO4 vidē ar Programmu GROUNDWATER VISTAS-6.

Zinātniskais. vadītājs Dr.sc.ing. A. Spalviņš

VPP projekta īstenošanā piedalījās RTU darbinieki J. Šlangens, O. Aleksāns, K. Krauklis, I. Lāce, V. Škibelis, A. Mačāns, I. Tabaka, I. Eglīte

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RTU, VMC direktors
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Katalogs sastāv no LAMO4 modelēto 467 upju galveno raksturlielumu tabulas un šo upju pazemes pieteču grafikiem. Tabulā ir šādi dati: upes indekss (reach), upes nosaukums, ar kādu LAMO slāni ir saites, garums [km], iztekas un ietekas augstumi [m vjl], kalibrēšanas parametrs upes piesaistei C, kataloga lpp., kurā skatāms upes pazemes pietece grafiks. LAMO4 vertikālā shematizācijā doti modeļa slāņa numuri (2. att.).

Ja $C \neq 1$, upes piesaiste ir mainīta modeli kalibrējot. Kalibrētā piesaiste = (piesaiste)/C.

LAMO4 darbojas licenzētas programmas GROUNDWATER VISTAS-6 (GV) vidē. Upju pazemes pietece grafiki ir iegūti ar GV rīkiem pēc shēmas (1. att.): Plot → Mass balance → BC Accretion Curve → River → Number of nodes downstream → Reach, Plot Cumulative Flow in Downstream direction. Šo opciju secība skatāma upes plūsmas aprēķinā shēmā upei Laucesa, kuras indekss (reach) ir 113.

Upes pazemes pietece plūsmas (m^3/dnn) uzkrājošais grafiks rāda kā kopīgā upes pietece pieaug, sākot no tās iztekas līdz ietekai. GV sistēmā šī plūsma ir negatīva.

Piemētam, Laucesas upei kopīgā plūsma tās ietekā ir -42.122 tūkst. m^3/dnn , bet upes iztekā – $150 \text{ m}^3/\text{dnn}$. Uz grafika horizontālās ass skatāms kopīgais mezglu skaits, N_i , kuros upe piesaistīta modeļa režģim. Laucesas upe piesaistīta 198 mezglos. Šo mezglu skaits atbilst šīs upes vadības datnes ierakstu skaitam. Attālumu l_i no upes iztekas dod empīriskā formula $l_i \sim 187 N_i$ [metri], kur $187 \sim 0.75 \times 250$ (250 metri ir LAMO4 režģa solis). Veidojot lokālus modeļus, jānovērš iespējamie defekti upēm, kuras atrodas modeļa areālā.

Ir pieejams režīms “Downstream Distance”, kurā uz horizontālās ass dots attālums metros no iztekas. Tomēr šajā režīmā uzrādītais upes garums ir stipri lielāks par faktisko. Tāpēc šo režīmu nav vēlams izmantot.

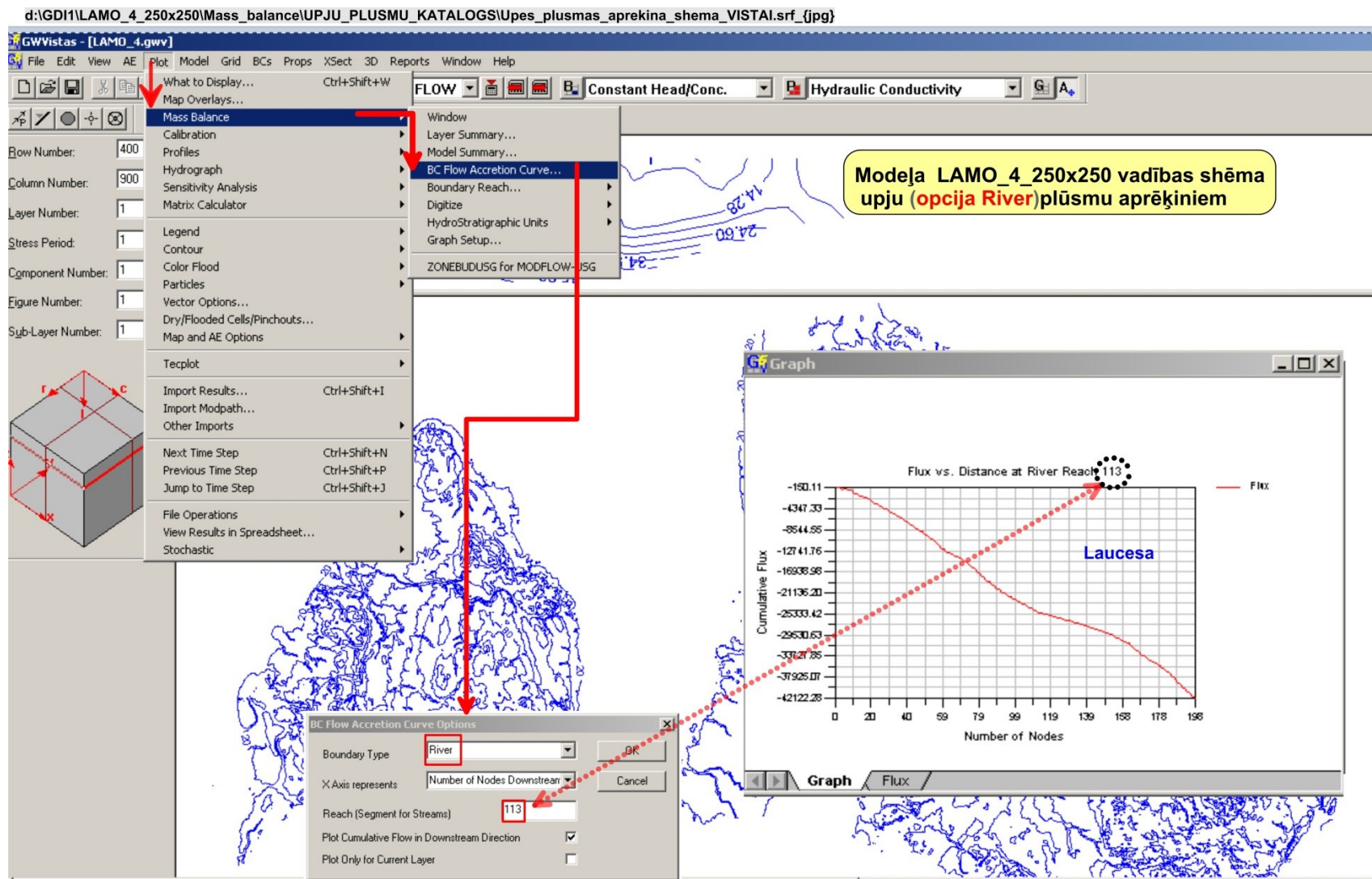
Pēc upes pazemes pietece plūsmas grafika izskata var spriest par pietece intensitāti tās posmos, par iespējamām kļūdām upes piesaistē modelim. Parasti kļūdas izpaužas kā pozitīvas plūsmas upes iztekā, kur parasti nav labu datu par upes ūdens līmeni.

Upju pazemes pietece grafiki atbilst LAMO4 saturam 2016. gada septembrī. Modelis tiek papildināts un tāpēc grafiki papildinātajā modelī var atšķirties no grafikiem katalogā.

Katalogs pieejams elektroniski 2 sējumos (1. sējums 1-52 lpp. 2. sējums 53-117 lpp.)

http://www.emc.rtu.lv/VPP/Upju_saraksts_katalogam_1.pdf

un http://www.emc.rtu.lv/VPP/Upju_saraksts_katalogam_2.pdf



1.att. Upes pazemes pietece plūsmas aprēķina shēma

HM slāņa Nr.	*	Slāņa nosaukums	HM slāņa kods	Laukums, [Tūkst.. km ²]	m_{vid} , [metri]
1		Reljefs	relh	71.29	0.02
2		Aerācijas zona	aer	71.29	0.02
3		Bezspiediena kvartārs	Q2	71.29	5.77
4		Augšējā morēna	gQ2z	71.29	22.20
5		Spiediena kvartārs	Q1#	7.4	6.13
6		Apakšējā morēna	gQ1#z	9.7	9.3
7		Ketleru	D3ktl#	5.32	61.46
8		Ketleru	D3ktlz	5.79	10.52
9		Zagares	D3zg#	7.43	42.65
10		Akmenes	D3akz	7.95	11.05
11		Kursas	D3krs#	9.34	22.34
12		Elejas	D3el#z	9.24	27.58
13		Daugavas	D3dg#	32.14	30.37
14		Salaspils	D3slp#z	35.78	12.67
15		Plavinu	D3pl	43.80	22.76
16		Amatas	D3am#z	45.14	8.97
17		Amatas	D3am	46.21	21.91
18		Upper Gauja	D3gj2z	48.80	11.62
19		Upper Gauja	D3gj2	50.92	26.34
20		Lower Gauja	D3gj1z	53.11	13.17
21		Lower Gauja	D3gj1	56.13	31.55
22		Burtnieku	D2brtz	58.09	15.41
23		Burtnieku	D2brt	68.74	45.02
24		Arikula	D2arz	68.74	15.02
25		Arikula	D2ar	68.74	40.03
26		Narva	D2nr#z	71.29	116.67
27		Pernava	D2pr	71.29	25.00

*  - sprostsłānis m_{vid} – vidējais biezums

2.att. LAMO4 vertikālā shematizācija

LAMO4 upju saraksts								
Nr. p.k.	Indekss	Upes nosaukums	Ar kādiem slāņiem saistīta	Garums [km]	Izteka [m vjl]	Ieteka [m vjl]	C	lpp.
1	1	Aiviekste	3,13	113.32	92.06	71.84	1.00	1
2	2	Alūksne	3	26.62	183.08	122.42	1.00	1
3	3	Amula	3,7,9,11, 13	55.49	102.77	30.46	5.00	1
4	4	Bolupe_2	3	40.50	101.15	88.98	1.00	1
5	5	Bārta	3	60.87	30.36	0.20	1.00	2
6	6	Dubna_3	3,15	70.40	99.95	81.78	0.33	2
7	7	Engure	3	26.67	20.70	12.31	1.00	2
8	8	Feimanka	3,15	67.07	153.89	90.88	0.33	2
9	9	Iča	3,13	73.58	149.00	89.71	1.00	3
10	10	Imula	3,7,9,11, 13	50.21	104.24	30.83	5.00	3
11	11	Jaša	3	33.47	149.12	98.15	0.33	3
12	12	Kuja	3	78.03	185.02	85.31	1.00	3
13	13	Leiksna	3	52.44	164.67	85.62	1.00	4
14	14	Malta	3,13	110.59	168.15	91.37	0.33	4
15	15	Nereta	3,15	44.26	105.93	78.39	1.00	4
16	16	Pededze	3,13	154.01	164.03	88.73	1.00	4
17	17	Rēzekne	3,13	115.13	163.30	92.11	0.33	5
18	18	Salaca	3,23	95.67	39.50	0.01	0.33	5
19	19	Oša	3,15	62.61	136.05	90.23	0.33	5
20	20	Vadakste	3,7	76.39	100.63	39.43	1.00	5
21	21	Vārtāja_Strīkupe	3,5	85.91	146.00	5.64	1.00	6
22	22	Abava	3,9,11,13 ,15,17,19	134.18	55.91	2.30	5.00	6
23	23	Bubieris	3	7.67	12.08	0.13	0.33	6
24	24	Ciecere	7,3	57.24	100.29	23.53	3.30	6
25	25	Durbe	3	56.65	23.11	0.21	0.33	7
26	26	Ēda	3,9,13	45.64	93.60	16.11	1.00	7
27	27	Grīva	3	32.45	44.87	0.05	1.00	7
28	28	Irbe Stende	3,23	134.64	88.35	0.02	1.00	7
29	29	Krievupe	3	43.41	71.07	0.18	1.00	8
30	30	Pitragšupe	3	5.98	18.34	0.35	1.00	8
31	31	Rinda	23,3	29.65	12.26	5.11	1.00	8
32	32	Rīva	3	59.13	62.09	0.16	3.30	8
33	33	Saka_Tebra	3	89.24	93.23	0.01	3.30	9

34	34	Udava	3	62.31	46.50	0.01	1.00	9
35	35	Venta	3,7,9,11, 13,15,17, 19,21	180.45	51.98	0.00	dažād i	9
36	36	Abuls	3,23	57.11	174.90	30.25	1.00	9
37	37	Aģe	3	44.19	51.38	0.13	1.00	10
38	38	Amata	3,15,17,1 9	81.04	216.40	21.26	1.00	10
39	39	Auce	3	88.50	100.78	0.69	3.30	10
40	40	Bebrupe	3	30.27	141.67	81.07	0.33	10
41	41	Bērze	3,9	115.20	110.71	0.60	3.30	11
42	42	Brasla	3,21,19	69.73	85.31	15.05	0.20	11
43	43	Briede	3,23	44.22	85.13	39.50	0.17	11
44	2221	Daugava	3,19,15,1 3	254.48	100.18	71.50	dažād i	11
45	45	Dienvidsuseja	3,15	116.95	125.39	49.78	1.00	12
46	46	Gauja	3,13,15,1 7,19,21,2 3	442.96	194.70	0.00	dažād i	12
47	47	Iecava	3,13	176.87	68.67	0.20	1.00	12
48	48	Iģe	3,23	56.36	87.39	34.76	1.00	12
49	49	Īslīce	3,11	47.96	37.83	1.05	1.00	13
50	50	Palsa_Jaunpalsa	3	75.95	220.14	91.35	1.00	13
51	51	Ķekaviņa	3,13,15	39.74	43.36	0.47	1.00	13
52	52	Ķīvuļurga	3	18.76	33.63	1.87	1.00	13
53	53	Līčupe	3	42.83	185.04	101.56	0.33	14
54	54	Lielā_Jugla_Jugla	3,13	67.73	66.88	0.10	1.00	14
55	55	Lielupe_Mēmele	3,13,11,1 5	237.16	73.09	0.00	dažād i	14
56	56	Līgatne	3,15,17,1 9	34.90	191.16	19.71	1.00	14
57	57	Lobe	3	23.44	81.00	61.08	0.33	15
58	58	Loja	3,19	21.72	42.16	8.35	3.00	15
59	59	Lokmene	3	24.54	130.86	80.91	0.33	15
60	60	Mazā_Jugla	3,13	129.07	151.24	0.16	1.00	15
61	61	Melnupe	3	80.13	199.65	56.22	0.50	16
62	62	Mergupe	3,13	60.42	210.95	67.03	1.00	16
63	63	Misa	3	113.13	45.62	0.40	1.00	16
64	64	Mūsa	13	31.50	21.92	9.32	10.00	16
65	65	Ogre	3,13	201.94	209.40	17.61	0.33	17
66	66	Pērse	3	52.76	192.16	71.57	3.30	17
67	67	Pēterupe	3	47.81	51.08	0.20	1.00	17

68	68	Platone	3,9	51.35	45.22	0.36	1.00	17
69	69	Puska	3	25.95	39.46	0.79	1.00	18
70	70	Rauna	3,19,21	52.42	208.08	25.58	5.60	18
71	71	Rauza	3	39.98	192.21	93.17	1.00	18
72	72	Rūja	3,23	82.99	78.56	39.52	1.00	18
73	73	Seda	3,23	67.65	65.10	39.51	0.33	19
74	74	Sesava	3	24.87	89.80	26.81	2.30	19
75	75	Sesava	3	45.67	44.55	0.42	1.00	19
76	76	Suda	3	39.39	120.38	67.35	1.00	19
77	77	Svete	3	104.02	79.55	0.19	3.30	20
78	78	Svētupe	3,23	57.70	48.89	0.18	1.00	20
79	79	Svitene	3,11	50.55	39.87	0.54	1.00	20
80	80	Tērvete	3	69.86	77.01	0.76	3.30	20
81	81	Tirza	3,13	91.54	237.54	82.27	2.00	21
82	82	Tumšupe	3	57.72	99.88	1.20	1.00	21
83	83	Vaidava	3	109.68	171.88	51.28	0.50	21
84	84	Vecpalsa	3,15	24.57	96.74	60.11	1.00	21
85	85	Viesīte	3	64.45	96.08	46.28	1.00	22
86	86	Vija	3,23	64.21	151.56	41.38	0.20	22
87	87	Vircava	3	51.55	44.32	0.41	1.00	22
88	88	Vitrupe	3,23	48.71	47.38	0.16	1.00	22
89	89	Vizla	3,13,15	26.38	147.82	66.79	1.00	23
90	90	Ālande	3	34.70	29.71	0.32	0.33	23
91	91	Apše	3	31.11	48.26	9.52	1.00	23
92	92	Arona	3	46.99	204.66	82.77	1.00	23
93	93	Asūnīca	3	42.23	158.47	123.22	1.00	24
94	94	Avīkne	3	28.37	120.03	80.81	1.00	24
95	95	Bullupe_2	3,9	28.93	126.50	75.53	1.00	24
96	96	Dursupe	3	30.54	99.41	0.77	1.00	24
97	97	Dviete	3	35.09	117.20	86.10	1.00	25
98	98	Dzedrupe	3	8.70	9.82	0.76	1.00	25
99	99	Dzelzupīte	3	10.98	95.45	80.10	5.00	25
100	100	Džūkste	3,11	33.67	45.86	0.24	0.33	25
101	101	Eglaine	3	34.79	107.72	82.75	1.00	26
102	102	Ezere	3	56.63	124.83	53.82	1.00	26
103	103	Ilūkste	3	44.01	139.67	84.91	1.00	26
104	104	Indra	3	65.11	184.76	97.28	1.00	26
105	106	Zilupe	3	74.07	131.20	102.81	0.20	27
106	107	Plāvupe	3	17.20	61.72	10.21	1.00	27
107	108	Juglas_kanāls	3	3.47	4.48	0.30	1.00	27

108	109	Kārklupe	3	13.44	99.25	86.62	5.00	27
109	110	Kira	3,13	42.83	111.23	71.61	2.50	28
110	111	Kūkova	3	59.34	104.15	77.32	2.50	28
111	112	Lauce	3,15	37.18	95.31	31.98	3.30	28
112	113	Laucesa	3	37.39	125.20	87.09	1.00	28
113	114	Lētīža	3,7	33.04	138.78	31.48	5.00	29
114	115	Liede	3	58.47	127.21	88.83	1.00	29
115	116	Liepna	3,13	59.69	148.90	72.00	2.50	29
116	119	Losis	3,7	36.70	135.19	36.74	5.00	29
117	120	Ludza	3	58.37	133.00	89.55	0.20	30
118	121	Lukne	3	10.79	30.04	20.78	0.33	30
119	122	Lūžupe	3	13.21	9.37	0.00	1.00	30
120	123	Mazirbe	3	8.61	21.32	0.00	1.00	30
121	124	Mazroja	3,21	19.58	65.43	34.07	1.00	31
122	125	Mellupe	3	16.65	225.80	181.95	1.00	31
123	126	Mērgava	3,13	22.98	85.00	30.68	0.33	31
124	127	Mērsraga kanāls	3	4.92	0.71	0.03	1.00	31
125	128	Mīlgrāvis	3	4.23	0.10	0.06	1.00	32
126	129	Odze	3	30.03	104.65	84.17	1.00	32
127	130	Oksle	3	11.75	76.16	16.93	1.00	32
128	131	Ostupe	3,23	32.90	73.76	7.36	1.00	32
129	132	Otaņķe	3	31.17	24.54	0.27	0.33	33
130	133	Pienava	3	33.69	70.07	2.20	0.33	33
131	134	Pilsupe	3,23	26.77	67.59	0.01	1.00	33
132	135	Riežupe	3,15,17	41.06	86.57	4.25	0.33	33
133	136	Rītupe	3,13	89.73	138.08	84.03	0.20	34
134	137	Roja	3,21	76.83	54.78	0.01	1.00	34
135	138	Runa	3	32.81	139.18	19.38	1.00	34
136	139	Sarjanka	3	84.02	172.16	100.29	1.00	34
137	140	Sārte	3	11.20	110.32	34.96	1.00	35
138	141	Šķēde	3	32.02	86.44	10.25	1.00	35
139	142	Šķervelis	3,7	13.08	95.92	31.62	5.00	35
140	143	Slocene	3,13	49.81	73.87	2.20	1.00	35
141	144	Starpiņupīte	3	0.72	2.11	0.50	1.00	36
142	145	Sventaja	3	72.58	35.32	0.02	0.33	36
143	146	Svente	3,13,15	20.87	101.28	27.01	1.00	36
144	147	Tartaks_2	3	21.55	143.46	100.45	1.00	36
145	148	Tirdzniecības_kanāls	3	0.48	0.12	0.01	1.00	37
146	149	Tirziņa	3,13	22.47	119.46	76.11	5.00	37
147	150	Valgale	3,13,15	22.53	103.66	23.83	1.00	37
148	151	Vašleja	3,13	17.05	61.21	36.50	1.00	37
149	152	Vecbērze	3	13.43	3.55	0.18	0.33	38

150	153	Vēda	3	48.88	128.34	72.93	2.50	38
151	154	Vēdzele	3,13	36.00	111.87	39.34	1.00	38
152	156	Vēždūka	3	36.02	44.95	0.15	1.00	38
153	157	Viesata	3,9,11	48.70	110.65	51.05	1.00	39
154	158	Zaņa	3,7	54.68	99.64	35.62	5.00	39
155	159	Ziemeļsuseja	3,13	58.42	114.88	74.82	3.30	39
156	160	Balupe_1	3,13	35.17	129.62	101.31	1.00	39
157	161	Dubna_1	3	14.89	180.65	158.62	0.33	40
158	162	Dubna_2	3	38.73	158.07	100.30	0.33	40
159	163	Jugla_2	3	2.49	0.10	0.10	1.00	40
160	164	Tartaks_1	3	3.12	149.77	143.51	1.00	40
161	165	Bārzvalks	3,23	7.95	30.28	14.66	1.00	41
162	166	Bullupe_3	3,23	15.49	79.59	40.62	1.00	41
163	167	Grīviņupīte	3,21	8.68	70.14	25.78	1.00	41
164	168	Jumara_Anula	3,23	19.36	61.74	28.37	1.00	41
165	169	Ķerupīte	3,15,17	8.25	88.49	57.01	5.00	42
166	170	Klučupete	3,19	13.35	69.29	16.24	1.00	42
167	171	Klūga	3	18.38	68.55	25.19	1.00	42
168	172	Lāčupīte	3,13	12.02	124.16	86.44	3.00	42
169	173	Lenčupe	3,21	28.09	79.32	22.82	5.00	43
170	174	Lorupe	3,15,17,1 9	10.10	99.71	11.53	1.00	43
171	175	Lukstupe	3,13	7.77	79.40	72.28	1.00	43
172	177	Mudaža	3	8.68	104.53	85.69	3.00	43
173	179	Rakšupe	3,17,19	12.81	155.57	21.93	1.00	44
174	180	Rāmnieku_strauts	17,3,19	2.41	79.28	14.44	1.00	44
175	181	Raunis	3,15,17,1 9	25.84	180.58	40.25	5.60	44
176	182	Salupe	3,13	5.03	79.98	74.79	1.00	44
177	183	Skalupe	3,15,17,1 9	16.05	122.36	20.50	1.00	45
178	184	Strīkupe	21	11.81	48.00	23.58	1.00	45
179	185	Sudmalu_strauts	3,7	5.90	119.06	78.52	1.00	45
180	186	Talīte	3,15,17,1 9	8.33	149.87	51.72	1.00	45
181	187	Vaive	3,17,19	20.64	181.15	39.84	5.60	46
182	189	Vikmeste	3,19	5.59	80.17	12.00	1.00	46
183	190	Vildoga	3,15,17,1 9	11.39	117.06	16.07	1.00	46
184	2223	Daugava	13,3,15	30.10	13.82	0.00	dažād i	46
185	191	Kazbarupe	3	9.36	134.88	104.79	5.00	47
186	192	Kamārce	3	21.90	22.53	0.10	1.00	47
187	193	Vidusupe	3	25.40	90.28	26.80	1.00	47

188	194	Kalnupe	3	18.69	40.54	0.82	1.00	47
189	195	Jurģupe	3	23.50	54.61	0.77	1.00	48
190	196	Trumpe	3	19.63	37.99	6.57	1.00	48
191	197	Milzgrāvis	3	19.90	74.53	0.14	1.00	48
192	198	Īvande	3,13,15,17	22.41	88.32	20.93	1.00	48
193	199	Līgupe	3,13	15.21	85.54	35.34	1.00	49
194	200	Bebrupe	3,13	10.23	70.04	35.38	1.00	49
195	201	Lčēupīte	3	30.60	70.10	0.06	1.00	49
196	202	Vanka	3,5	32.10	91.37	7.89	1.00	49
197	203	Kauliņupe	3	24.91	83.85	10.16	1.00	50
198	204	Ciecere(Mazupe)	3,7	18.56	119.36	100.64	1.00	50
199	205	Alkšņupe	3	22.14	84.43	55.89	1.00	50
200	206	Līgotne	3	13.47	105.15	89.62	1.00	50
201	207	Graudupīte	3,9	14.58	59.93	40.95	1.00	51
202	208	Līkupe	3	42.66	114.99	64.69	1.00	51
203	209	Druve	3	22.65	118.98	94.21	1.00	51
204	210	Bruzile	3	21.73	89.45	62.39	1.00	51
205	211	Paksīte	3,7	18.43	85.13	35.41	1.00	52
206	213	Dzelda	3	20.81	138.74	49.47	5.00	52
207	214	Koja	3,7	31.15	102.72	26.78	5.00	52
208	215	Virga	3	24.46	95.07	14.30	1.00	52
209	217	Paurupe	3	14.27	17.40	0.24	0.33	53
210	218	Tosele	3	12.26	4.55	0.31	1.00	53
211	219	Ječupe	3	17.51	16.80	0.88	1.00	53
212	220	Lāņupe	3	17.04	94.02	23.20	1.00	53
213	221	Pluģupīte	3	18.60	99.27	24.20	1.00	54
214	222	Akmene	3	15.96	64.65	17.46	1.00	54
215	223	Alokste	3	47.49	89.36	19.92	1.00	54
216	224	Skalda	3	12.54	50.77	36.51	1.00	54
217	225	Ēnava	3,9	17.95	49.45	20.89	1.00	55
218	226	Ponakste	3	24.45	65.24	21.40	1.00	55
219	227	Krimelde	3,7	23.84	99.93	64.80	1.00	55
220	228	Mazupe	3	11.18	44.24	18.82	1.00	55
221	229	Dūrupe	3	16.86	73.52	38.35	1.00	56
222	230	Veldze	3,15	28.81	88.71	19.53	0.33	56
223	231	Dižgrātvis	3,5	13.99	19.43	4.80	1.00	56
224	232	Spāre	3	11.28	26.75	21.03	1.00	56
225	233	Skujene	3,9	30.34	88.82	18.47	3.30	57
226	234	Svēpaine	3	26.68	85.94	35.89	3.30	57
227	235	Ālave	3	31.04	74.65	12.90	3.30	57
228	236	Vilce	3,9	20.36	49.20	16.39	3.30	57
229	237	Rukūze	3	11.03	44.38	18.99	3.30	58

230	238	Sidrabe	3	18.41	39.08	18.26	1.00	58
231	239	Eleja	3	30.90	39.35	2.99	1.00	58
232	240	Oglaine	3	27.83	43.20	7.33	1.00	58
233	241	Audruve	3	23.79	39.31	11.91	1.00	59
234	242	Liepars	3	24.83	41.97	10.50	1.00	59
235	243	Bērstele	3	13.66	34.72	15.47	1.00	59
236	244	Melnupīte	3	17.16	44.10	18.75	1.00	59
237	245	Plānīte	3	17.95	39.57	22.37	1.00	60
238	246	Ceraukste	3,13	23.74	34.88	14.71	1.00	60
239	247	Garoze	3	27.75	19.02	0.62	1.00	60
240	248	Vecbērzes_apvadkanāls	3	16.39	4.71	1.14	0.33	60
241	249	Bikstupe	3,9	34.32	109.54	48.57	1.00	61
242	250	Slampe	3,13	15.88	44.58	8.58	0.33	61
243	251	Vecslocene	3	7.50	2.19	1.40	0.33	61
244	252	Vēršupīte	3	22.57	39.72	1.53	1.00	61
245	253	Smakupe	3	20.73	19.26	2.57	1.00	62
246	254	Jāņupe	3	18.12	24.26	4.68	1.00	62
247	255	Talķe	3	33.50	65.06	22.81	1.00	62
248	256	Bērzene	3	19.17	33.06	3.65	1.00	62
249	257	Zvirgzde	3,13	28.99	54.77	21.30	1.00	63
250	258	Vīksniņa	3	19.37	47.59	25.61	1.00	63
251	259	Ģirupe	3	11.55	74.27	51.59	1.00	63
252	260	Cēze	3	14.48	79.16	59.20	1.00	63
253	261	Zalvīte	3	35.67	94.59	62.26	1.00	64
254	262	Dūņupe	3	13.84	78.68	72.45	1.00	64
255	263	Klauce	3	21.34	104.94	78.79	1.00	64
256	264	Arālīte	3	17.18	119.22	85.77	1.00	64
257	265	Radžupe	3	20.80	114.61	89.11	1.00	65
258	266	Dobe	3	10.14	115.76	96.08	1.00	65
259	267	Šēderes_strauts	3	11.01	187.57	93.98	1.00	65
260	268	Rauda	3	8.15	141.86	125.19	1.00	65
261	269	Pakrace	3	10.18	136.35	98.37	1.00	66
262	270	Kreuna	3	7.30	127.18	108.16	1.00	66
263	271	Kumpota	3	14.40	129.80	95.54	1.00	66
264	272	Jāņupīte	3	16.51	145.52	93.65	1.00	66
265	273	Poguļanka	3,5	23.36	174.43	93.00	1.00	67
266	274	Borne	3,5	16.10	153.89	93.73	1.00	67
267	275	Balta	3	15.48	168.84	92.47	1.00	67
268	276	Rudņa	3	27.42	171.32	92.64	1.00	67
269	277	Viļeika	3	11.01	134.44	96.40	1.00	68
270	278	Skaista	3	16.92	160.95	97.26	1.00	68
271	279	Rosica	3	51.43	164.53	99.19	1.00	68

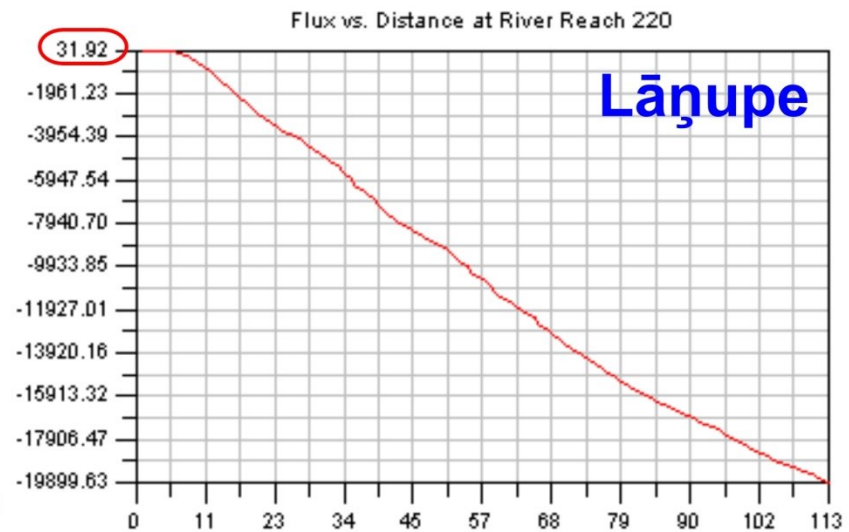
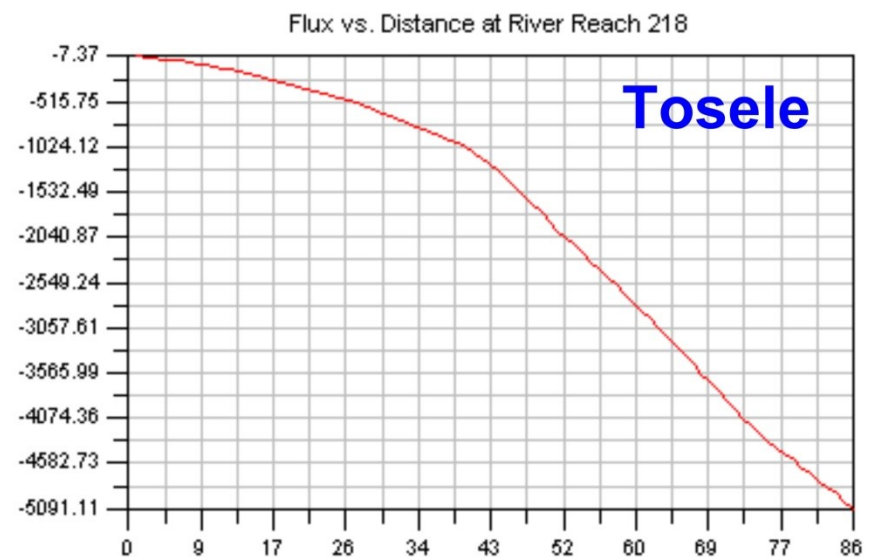
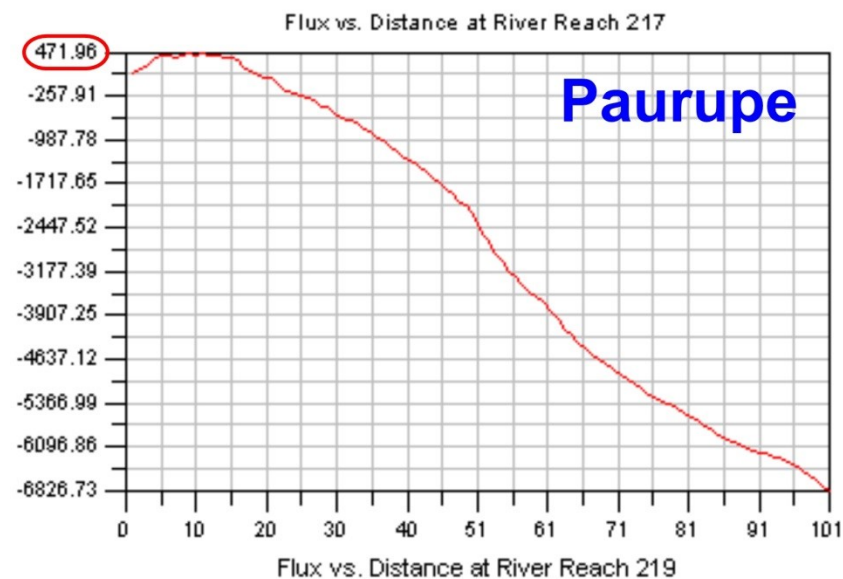
272	280	Savica	3	15.65	156.45	106.01	1.00	68
273	281	Čaušica	3	25.98	175.73	131.83	1.00	69
274	282	Mojneica	3	16.71	145.80	142.86	1.00	69
275	283	Plisunka	3	13.10	153.02	117.81	1.00	69
276	284	Pilda	3	24.93	180.09	138.42	1.00	69
277	285	Leidiukšņa	3	10.08	154.86	139.20	1.00	70
278	286	Pilda_2	3	9.43	138.25	133.11	1.00	70
279	287	Strauja	3	22.36	127.09	98.76	1.00	70
280	288	Tilža	3,13	37.96	124.77	93.26	2.50	70
281	289	Rika	3,13	35.67	130.21	82.24	1.00	71
282	290	Supenka	3,13	18.78	119.92	87.72	1.00	71
283	291	Ludumka	3	20.90	104.90	77.05	1.00	71
284	292	Niedrupīte	3	22.39	99.35	75.50	1.00	71
285	293	Vārniene	3	47.36	124.81	91.25	1.00	72
286	294	Sudarbe	3	19.88	123.88	101.04	1.00	72
287	295	Pokratiņa	3	20.61	119.02	91.47	1.00	72
288	296	Zušupe	3,13	12.60	159.39	94.58	1.00	72
289	297	Dūkšupe	3,13	20.53	114.79	94.34	1.00	73
290	298	Igrīve	3,13	17.09	134.97	114.40	1.00	73
291	299	Voroža	3	32.57	135.69	106.10	1.00	73
292	300	Kūdupe	3,13	22.43	151.47	125.21	1.00	73
293	301	Virgulica	3,13	15.13	164.38	136.93	1.00	74
294	302	Teterupe	3	21.20	110.11	91.60	1.00	74
295	303	Ievedne	3,13	23.09	191.50	107.95	1.00	74
296	304	Akaviņa	3	22.87	176.77	143.85	1.00	74
297	305	Pērļupīte	3	13.57	163.75	140.52	1.00	75
298	306	Pedele	3	19.42	182.53	66.08	1.00	75
299	307	Blīgzna	3	17.64	158.79	93.70	1.00	75
300	308	Paparze	3,13	28.21	167.81	107.89	1.00	75
301	310	Dzērve	3	12.80	105.18	77.68	5.00	76
302	311	Vidaga	3,13,15	23.80	124.11	69.03	1.00	76
303	312	Niedrupīte	3	18.38	110.70	85.28	1.00	76
304	313	Stepupe	3	17.26	85.11	51.04	1.00	76
305	314	Pubuļupe	3	18.34	85.60	58.03	1.00	77
306	315	Kaiču_upe	3	8.98	61.12	47.41	1.00	77
307	316	Rikanda	3	22.26	82.74	47.09	1.00	77
308	317	Pedele	3,23	21.65	68.65	39.29	1.00	77
309	318	Omuļupe	3	14.68	80.49	64.80	1.00	78
310	319	Ķīre	3	16.81	54.88	47.45	1.00	78
311	320	Acupīte	3	33.15	86.16	47.30	1.00	78
312	321	Juldruga	3	12.34	93.11	49.01	1.00	78
313	322	Sapraša	3	25.81	73.22	42.84	1.00	79

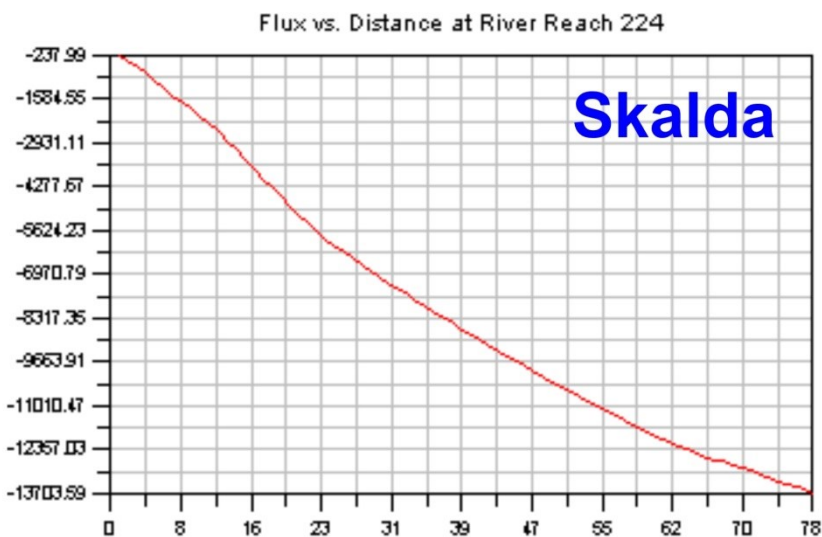
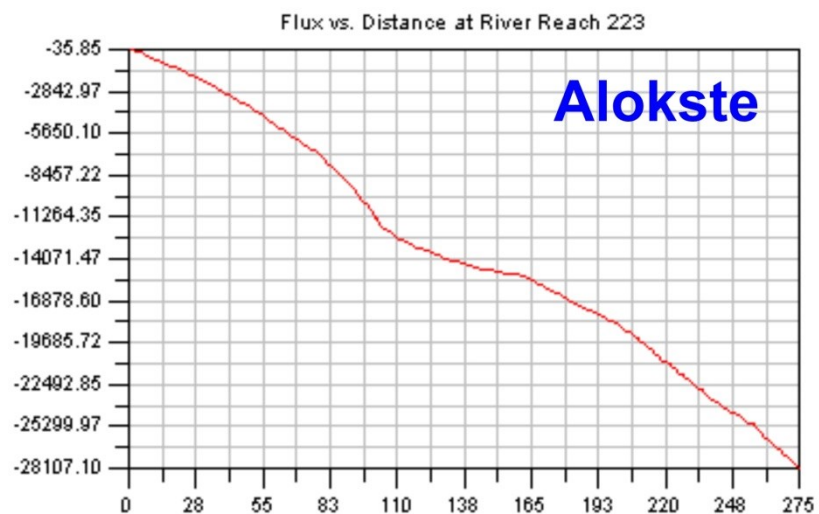
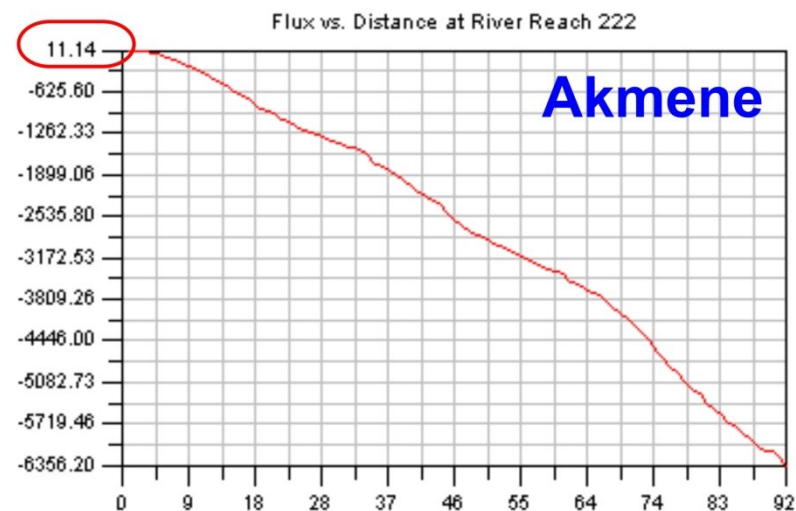
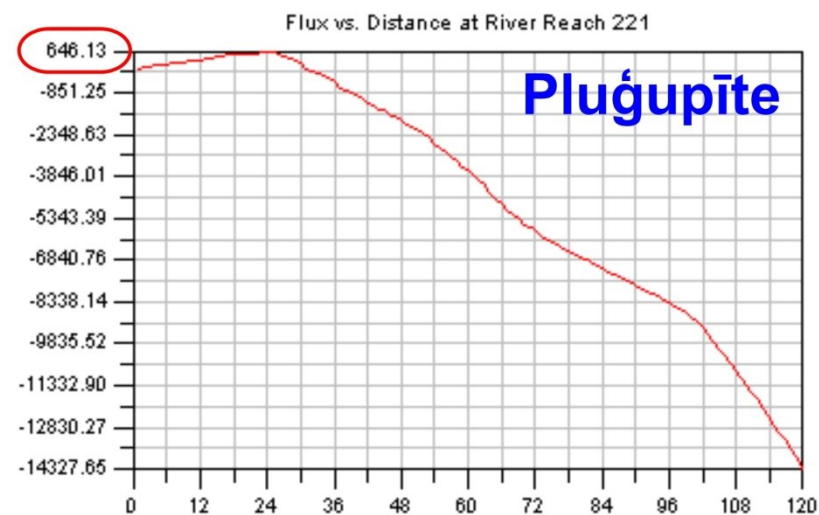
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315	324	Glāžupe	3,23	21.07	54.00	27.12	1.00	79
316	325	Jogla	3,23	30.08	76.40	29.87	1.00	79
317	326	Korģe	3,23	28.66	58.92	7.12	1.00	80
318	327	Ārupīte	3	15.44	48.83	27.15	1.00	80
319	328	Liepupe	3	22.17	45.54	0.49	1.00	80
320	329	Ķīšupe	3	36.51	58.08	0.46	1.00	80
321	330	Jugla	3,21	19.13	68.56	36.29	0.20	81
322	331	Iesala	3	27.47	74.04	57.24	0.20	81
323	332	Lūdiņupe	3	14.36	69.30	47.36	1.00	81
324	333	Sunīte	3	8.29	86.72	72.99	1.00	81
325	334	Piestīņa	3	15.39	95.01	79.19	1.00	82
326	335	Podvāze	3	22.68	111.89	79.62	1.00	82
327	336	Ērmīte	3,15	15.56	117.70	84.85	1.00	82
328	337	Aldaunīca	3	10.89	117.31	94.27	1.00	82
329	338	Sanaude	3	15.73	119.19	95.77	1.00	83
330	339	Šustjanka	3	12.71	107.82	95.27	1.00	83
331	340	Preiļupe	3	20.61	148.59	108.76	1.00	83
332	341	Joņupe	3	18.62	99.12	83.83	1.00	83
333	342	Kolupe	3	30.43	111.90	94.01	1.00	84
334	343	Pušica	3	12.21	158.79	149.80	1.00	84
335	344	Balda	3	24.72	171.92	147.32	1.00	84
336	345	Liska	3	18.98	165.80	129.33	1.00	84
337	346	Pārtova	3	12.62	180.72	161.70	1.00	85
338	347	Kiudolica	3	19.04	157.15	135.07	1.00	85
339	348	Ciskoda	3	13.44	129.79	113.48	1.00	85
340	349	Čečora	3	28.01	142.07	107.28	1.00	85
341	350	Liužonka	3,13	30.86	162.75	99.54	1.00	86
342	351	Moziča	3	38.76	155.35	91.43	1.00	86
343	352	Sauna	3	36.08	133.96	94.28	0.33	86
344	353	Ataša	3	17.59	96.08	84.60	1.00	86
345	354	Mārsna	3	16.67	104.50	85.15	1.00	87
346	355	Bērzaune	3,13	25.32	95.95	73.99	1.00	87
347	356	Babraunīca	3,13	21.28	96.00	72.73	1.00	87
348	357	Pikstere	3,13	20.15	91.49	71.76	1.00	87
349	358	Odze	3	9.88	91.99	85.45	1.00	88
350	359	Pelava	3	14.41	115.02	88.23	1.00	88
351	360	Valola_Lubeja	3	15.83	180.04	164.08	1.00	88
352	362	Savīte	3	25.46	211.64	88.37	1.00	88
353	363	Bērzaune	3	31.67	238.29	85.03	1.00	89
354	364	Taleja	3	22.15	235.37	90.95	1.00	89
355	365	Meirānu_kanāls	3	17.07	90.68	87.46	1.00	89

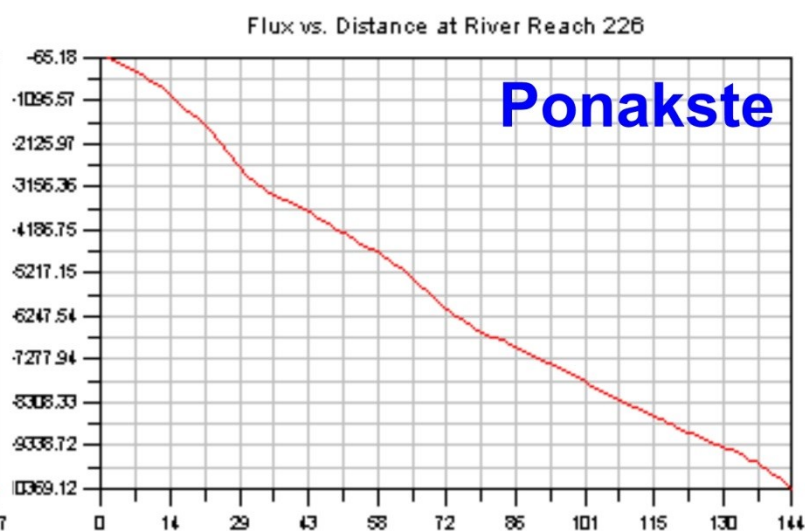
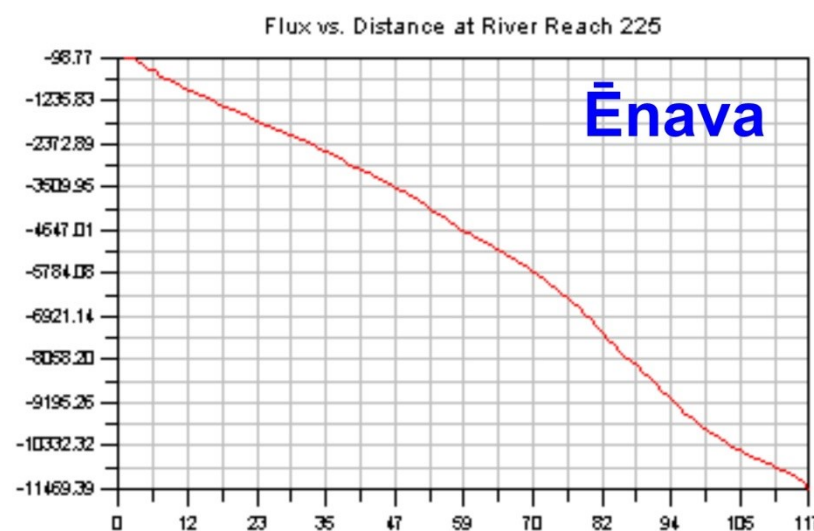
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357	367	Kažova	3,13	14.42	106.02	94.65	1.00	90
358	368	Teicija	3	25.00	109.04	90.20	1.00	90
359	369	Lisiņa	3	19.54	101.64	90.53	1.00	90
360	370	Isliena	3	23.42	104.53	87.80	1.00	90
361	371	Abaine	3	13.16	92.10	88.87	1.00	91
362	372	Piestīņa	3	20.24	116.55	89.23	1.00	91
363	373	Saipeite	3	16.47	118.87	93.20	1.00	91
364	374	Keiba	3	26.96	122.38	91.46	1.00	91
365	375	Paukle	3	17.52	114.34	91.27	1.00	92
366	376	Libe	3	18.21	208.66	96.95	1.00	92
367	377	Rieba	3	19.52	239.32	94.00	1.00	92
368	378	Sūla	3	18.80	239.57	104.26	1.00	92
369	379	Ogrīte	3	8.46	244.34	200.12	1.00	93
370	380	Arupīte	3	17.83	74.80	31.96	1.00	93
371	381	Dūņupe	3	11.91	93.81	74.81	1.00	93
372	382	Zaube	3	30.37	192.87	92.79	1.00	93
373	383	Ranka	3	15.94	59.86	32.42	0.33	94
374	384	Aviekste	3	28.86	90.65	51.99	0.33	94
375	385	Kaibala	3,13	17.04	83.80	33.30	1.00	94
376	386	Brasla	3,13	24.86	89.28	32.13	1.00	94
377	387	Ļaudonīte	3	7.98	210.76	176.90	1.00	95
378	388	Donaviņa	3	12.41	97.85	75.66	1.00	95
379	389	Raduleja	3	8.60	142.96	124.28	1.00	95
380	390	Sita	3	36.92	134.58	97.52	1.00	95
381	391	Dzirla	3	20.09	125.20	101.76	1.00	96
382	392	Mellupe	3	23.47	145.01	96.37	1.00	96
383	393	Pogupe	3	14.06	124.50	100.56	1.00	96
384	394	Krustalīce	3	22.53	128.80	94.60	1.00	96
385	395	Audile	3	19.61	112.50	90.76	1.00	97
386	396	Mandaugas grāvis	3	23.90	117.51	92.28	1.00	97
387	397	Ušurupe	3	10.88	112.49	100.11	1.00	97
388	398	Virāne	3	10.23	121.10	115.91	3.00	97
389	399	Azanda	3	18.00	187.20	117.99	3.00	98
390	400	Uriekste	3	20.21	179.67	109.13	1.00	98
391	401	Tulija	3	16.69	227.43	161.90	1.00	98
392	402	Šepka	3	22.48	175.26	107.07	1.00	98
393	403	Nigra	3,17	23.83	176.57	57.70	1.00	99
394	404	Lisa	3	29.00	174.08	50.17	1.00	99
395	405	Pīsla	3	13.27	216.52	182.34	1.00	99
396	406	Dzerbe	3	7.60	199.58	179.53	1.00	99
397	407	Vējupīte	3,15,17,1 9	8.16	102.81	13.60	1.00	100

398	408	Abze	3	41.60	105.13	61.98	1.00	100
399	409	Alūksnīte	3	10.08	100.23	89.28	1.00	100
400	410	Udziņš	3	9.20	161.01	137.34	1.00	100
401	411	Orisāre	3	6.22	194.19	185.01	1.00	101
402	412	Meldrupīte	3,15,17	13.61	188.08	53.05	1.00	101
403	413	Ziedene	3	12.58	60.49	53.10	1.00	101
404	414	Mazbriede	3	20.39	77.06	50.02	1.00	101
405	415	Strenčupīte	3,23	20.79	64.44	37.21	1.00	102
406	416	Straujupīte	3	16.21	48.16	6.01	3.00	102
407	417	Sudaliņa_Olekšupīte	3	15.41	110.10	83.89	3.00	102
408	418	Ķikans	3	20.33	77.23	0.00	1.00	102
409	419	Padure	3,17	17.47	50.32	3.44	0.33	103
410	420	Dzirnavupe	3	10.78	89.97	30.65	1.00	103
411	421	Kauliņupe	3	6.63	97.88	49.90	1.00	103
412	422	Vidvide	3	20.72	122.54	20.67	1.00	103
413	423	Bullupe_1	3	10.74	0.02	0.02	1.00	104
414	424	Langa	3	15.18	6.11	0.10	1.00	104
415	425	Sāvīte	3	9.52	99.49	79.70	1.00	104
416	426	Labonīte	3	6.00	194.99	147.19	1.00	104
417	427	Bļožupete	3	2.56	214.90	191.29	1.00	105
418	428	Meltne	3	16.13	199.79	171.60	1.00	105
419	429	Bēzupe	3	16.97	185.05	91.39	1.00	105
420	430	Dzirnavupe	3	11.77	183.94	104.86	1.00	105
421	431	Svīnupīte	3,15,17,1 9	6.93	107.26	13.21	1.00	106
422	432	Nurmižupīte	3,15,17,1 9	6.03	113.48	29.81	1.00	106
423	433	Ežupe	3,15	8.55	136.78	78.25	1.00	106
424	434	Pērļupe	3,15,17	8.37	154.22	63.78	1.00	106
425	435	Nedienne	3	11.31	204.08	134.53	1.00	107
426	436	Cimziņa	3	12.82	200.90	75.44	1.00	107
427	437	Līčupe	3	14.72	205.65	116.62	1.00	107
428	438	Dranda	3	6.16	155.50	125.48	1.00	107
429	439	Cērtene	3	6.06	148.36	126.94	1.00	108
430	440	Vienziemīte	3	8.09	236.02	178.05	1.00	108
431	441	Līčupe_2	3	12.63	143.60	120.77	1.00	108
432	442	Pļepovka	3	7.12	166.16	87.33	1.00	108
433	443	Stirna	3	8.37	143.33	97.34	1.00	109
434	444	Ceģeļņa	3	14.71	191.45	145.81	1.00	109
435	445	Grīva	3	7.98	116.98	110.83	1.00	109
436	446	Kārnīte	3	9.19	125.28	110.45	1.00	109
437	447	Kurna	3	19.06	122.86	100.56	1.00	110
438	448	Pērļupe	3,23	19.77	76.18	36.07	1.00	110

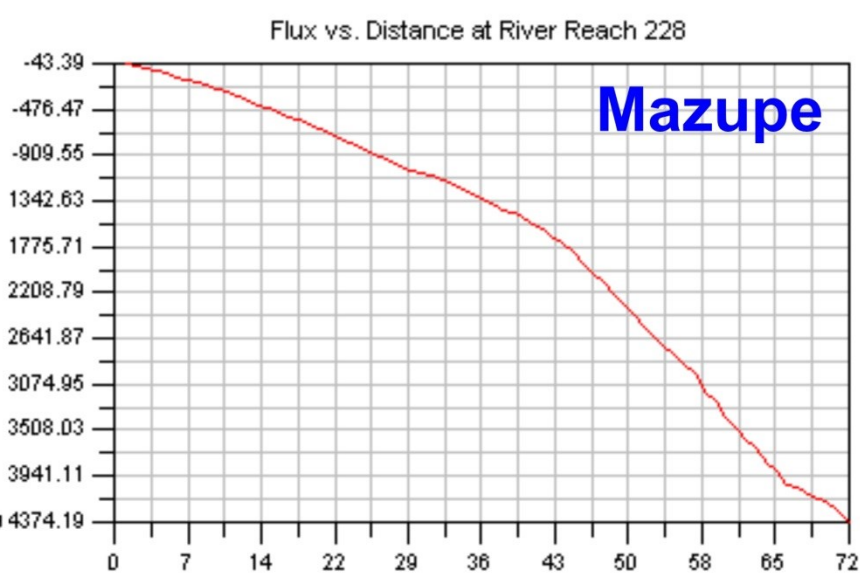
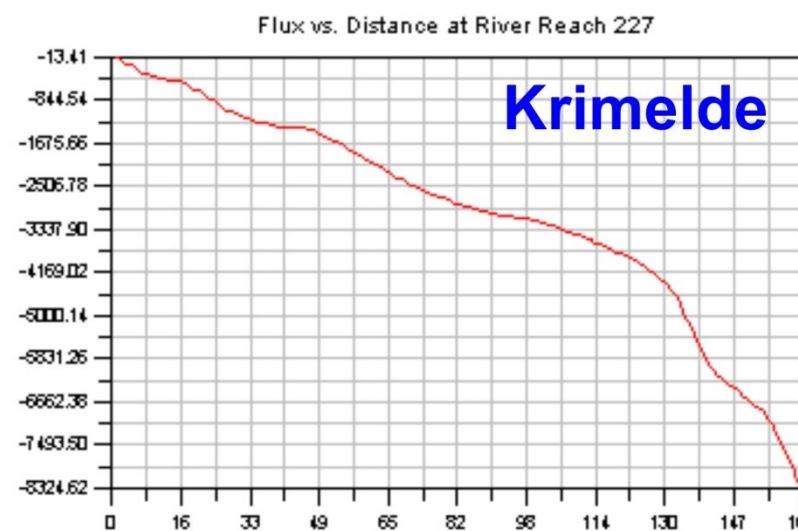
439	449	Kurliņupe	3	12.19	29.21	0.69	1.00	110
440	450	Zaķupīte	3,23	14.61	35.75	0.19	1.00	110
441	451	Duntes_strauts	3	7.96	42.97	0.22	1.00	111
442	452	Garūdene	3,7	23.80	121.91	21.57	1.00	111
443	453	Jāmaņupe	3	6.68	75.71	61.12	1.00	111
444	454	Lējējupe	3,11	26.47	77.82	17.13	1.00	111
445	455	Sprincupe	3	14.23	84.95	19.58	1.00	112
446	456	Vārme	3,11	23.85	89.13	30.23	1.00	112
447	457	Lonaste_Raķupe	3,23	54.94	56.94	7.26	1.00	112
448	458	Pāce_Pieņupe	3,23	33.50	72.22	13.59	1.00	112
449	459	Klāņu_Būšnieku_kanāls	3,23	10.14	18.19	11.78	1.00	113
450	460	Dzirnavupe_Kažupe	3	25.46	51.25	1.22	1.00	113
451	461	Kazena	3	11.89	180.20	169.80	1.00	113
452	462	Čodorānu_upe	3	24.26	161.70	105.76	1.00	113
453	463	Stakļupīte	3,23	18.83	59.47	37.55	1.00	114
454	464	Vaipa	3	5.50	88.94	61.58	1.00	114
455	465	Damiķis	3,7	7.59	104.03	36.44	1.00	114
456	466	Sēme	3	9.65	35.84	26.98	1.00	114
457	467	Vedze	3	15.19	192.60	138.34	1.00	115
458	468	Nabe	3	21.11	49.67	49.66	0.20	115
459	469	Ķīve	3,9	11.83	47.12	22.49	1.00	115
460	155	Veseta	3,13	61.92	187.80	74.35	1.00	117
461	105	Istra	3	39.69	145.33	109.69	0.20	117
462	470	Neriņa	3	20.00	9.56	0.23	1.00	115
463	471	Miglupe	3	7.59	9.37	0.40	1.00	116
464	472	Dzilnupe	3	11.44	9.85	1.25	1.00	116
465	473	Olainīte	3	8.63	9.46	2.83	1.00	116
466	474	Cena	3	17.40	9.38	0.48	1.00	116
467	475	Mārupīte	3	12.14	14.43	0.38	1.00	117

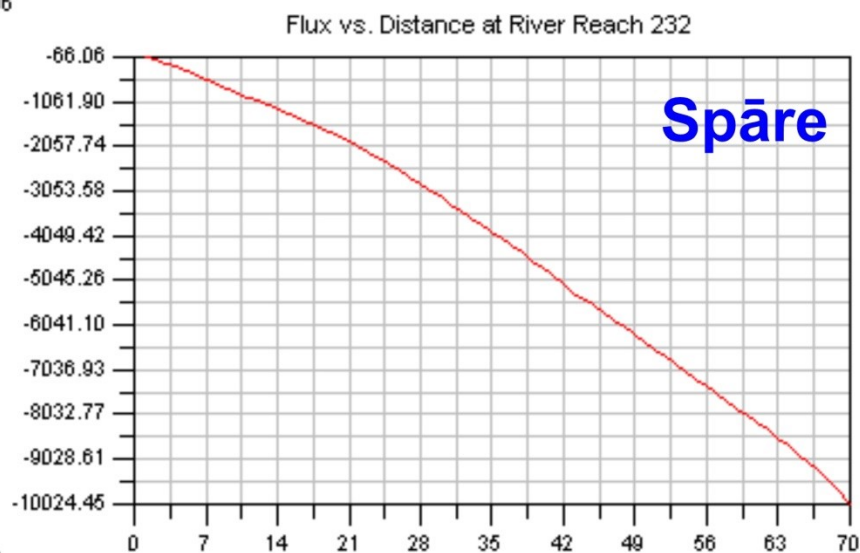
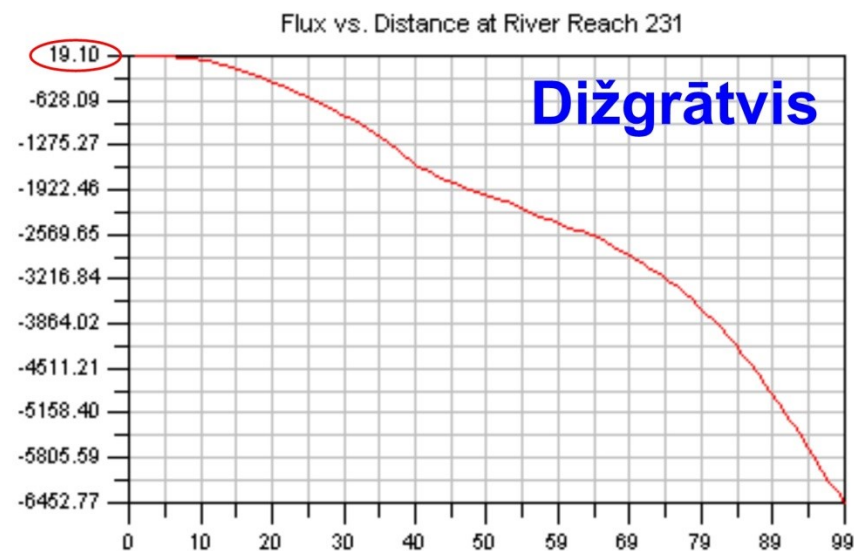
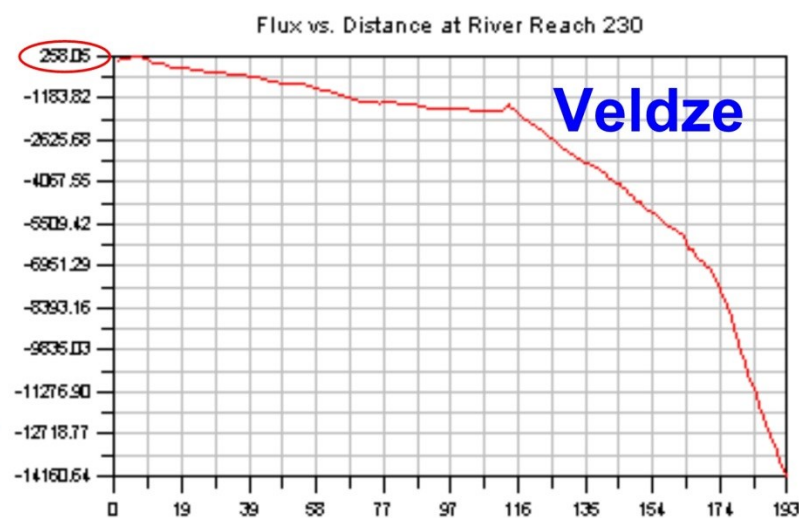
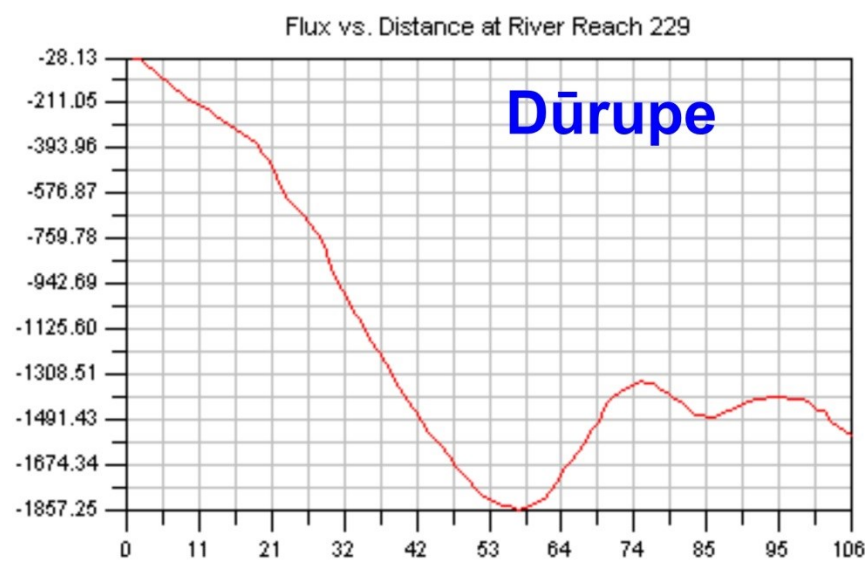


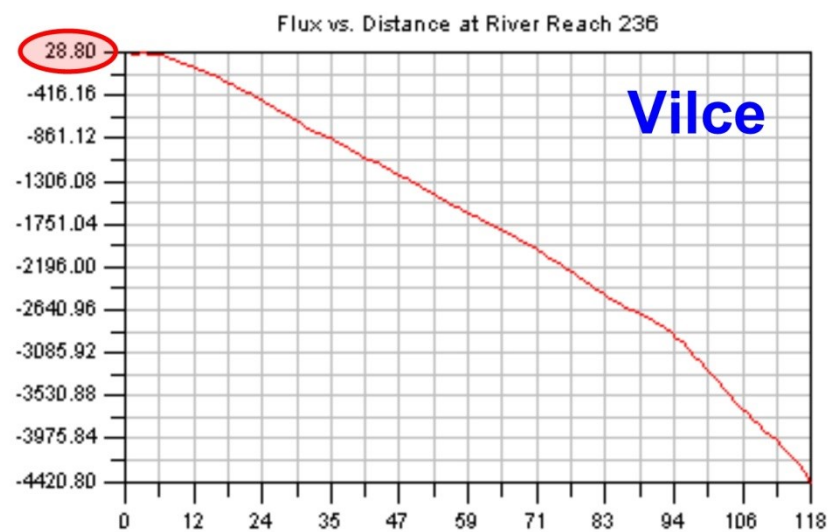
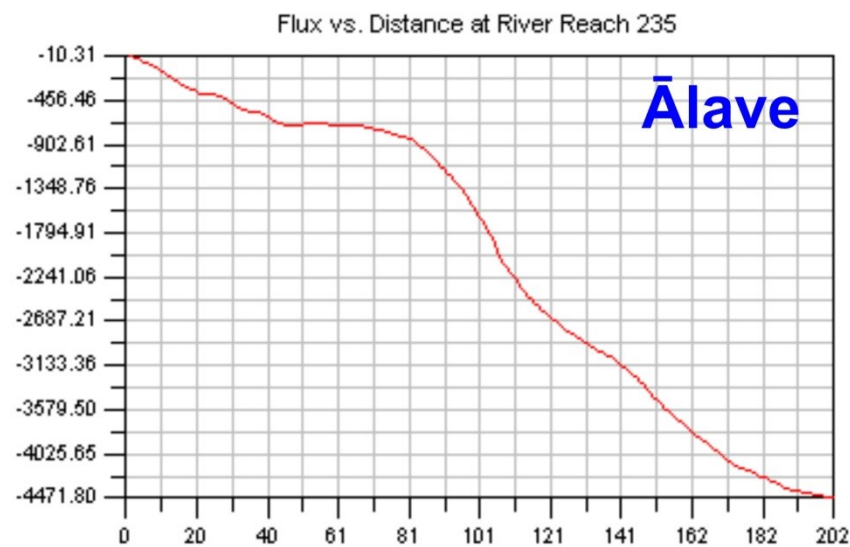
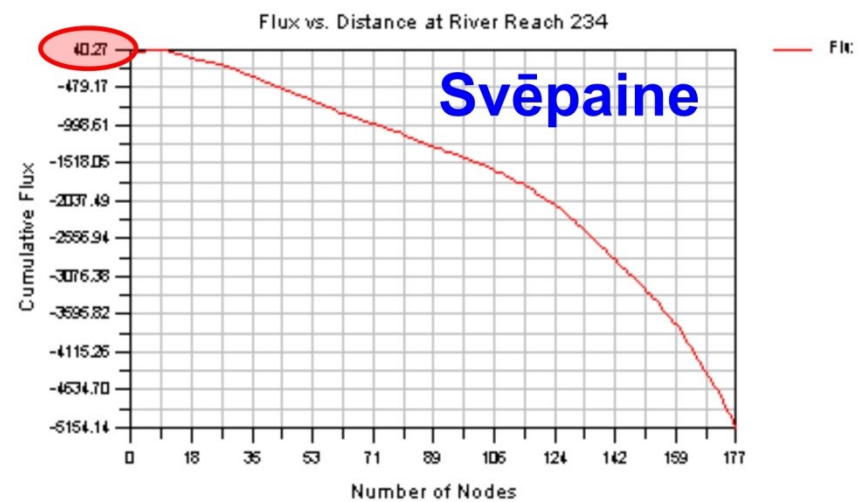
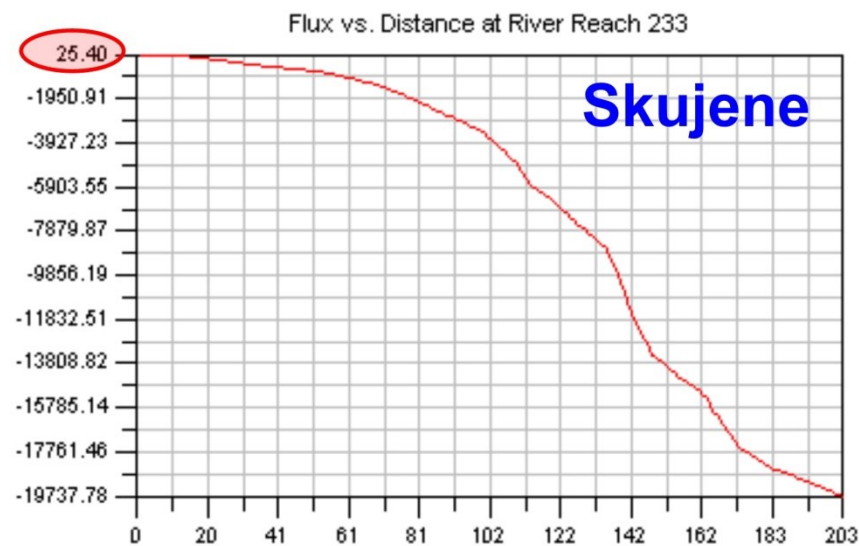


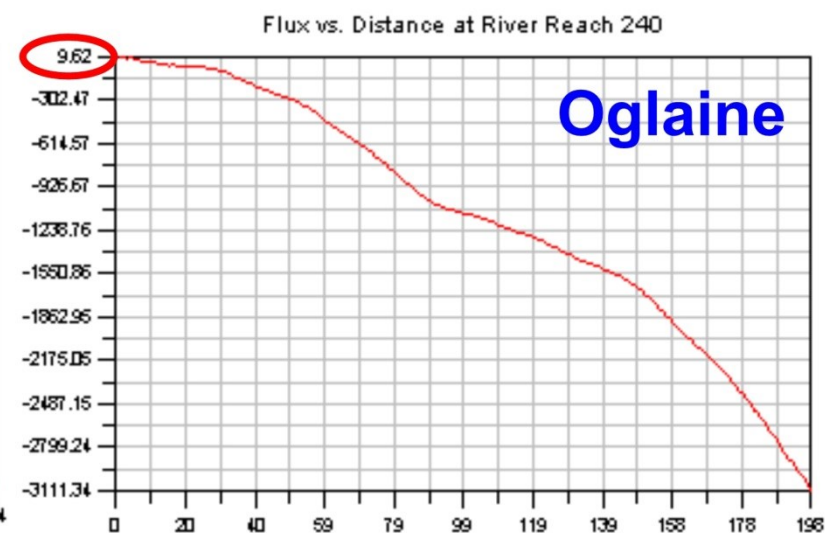
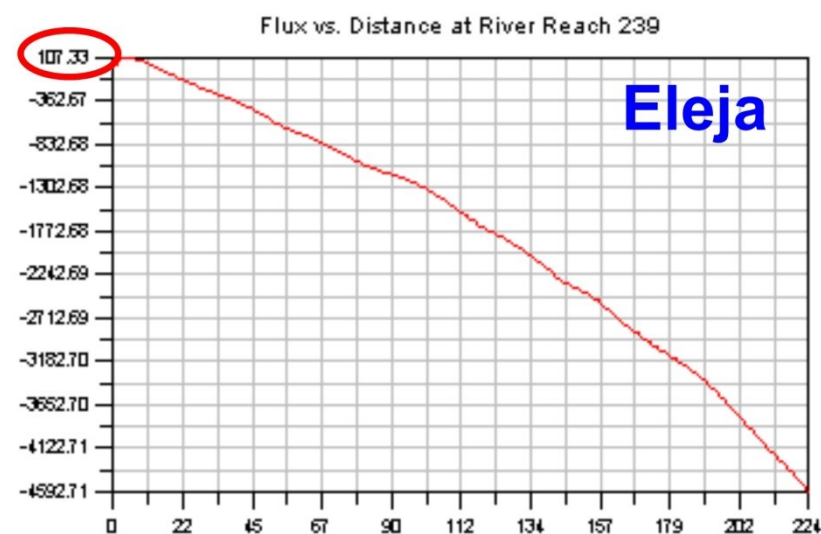
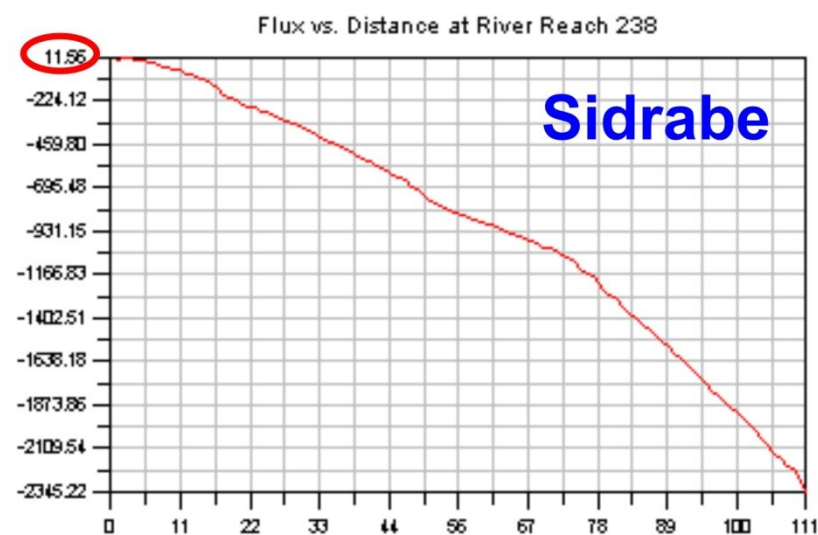
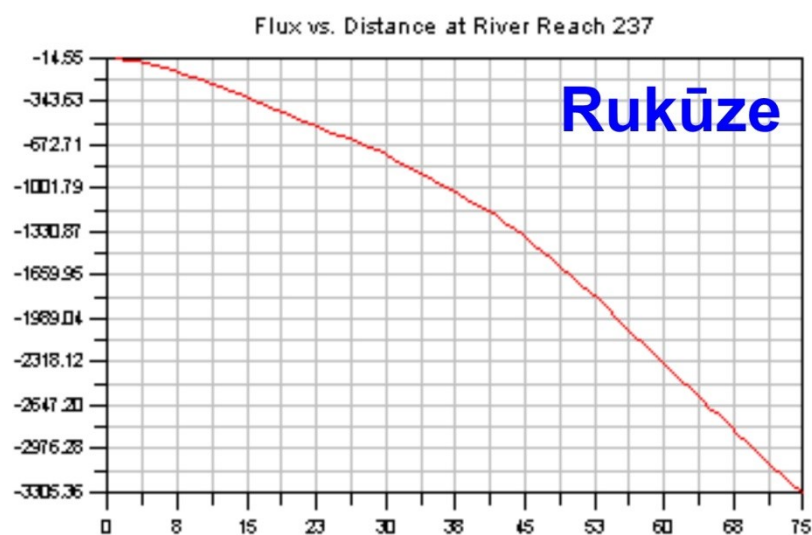


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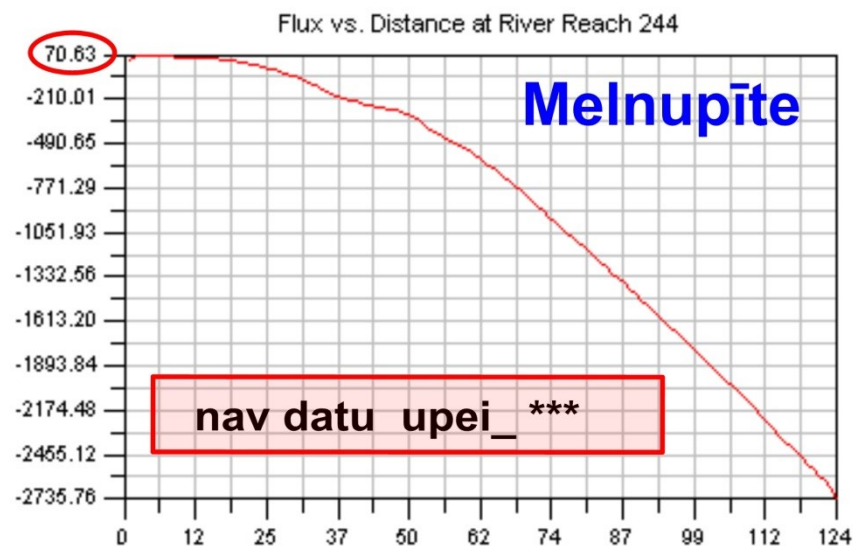
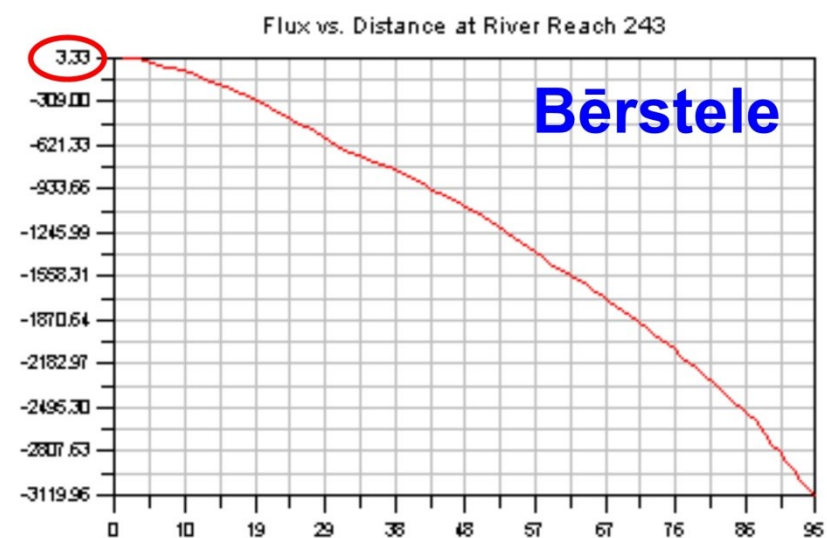
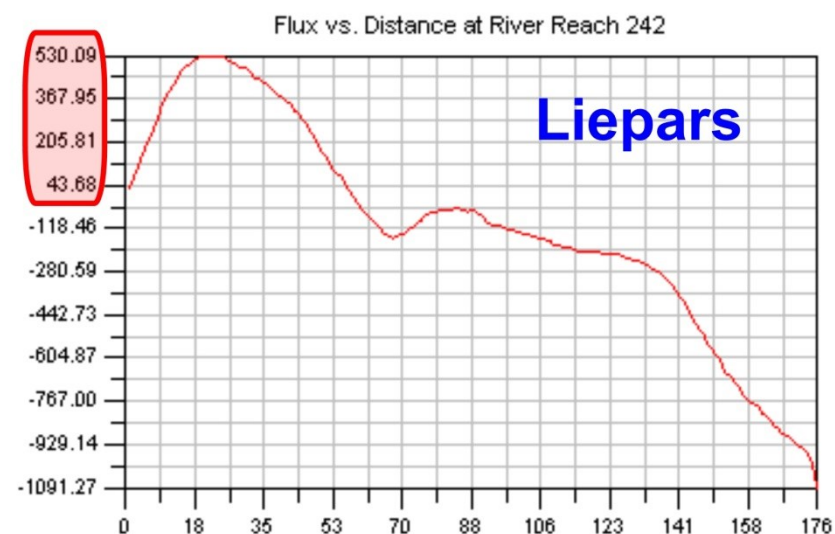
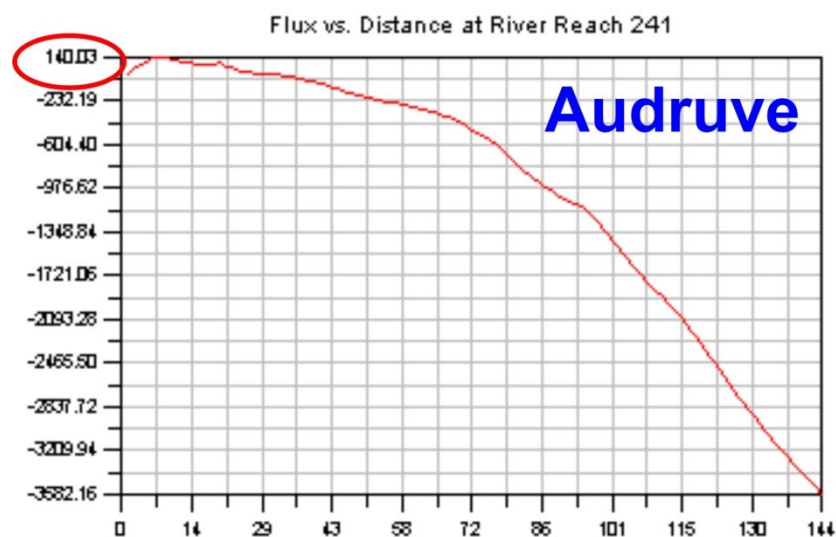


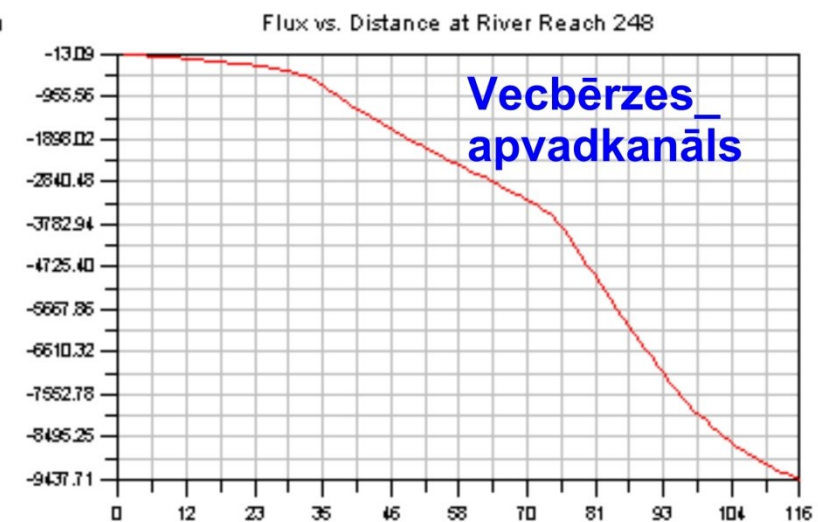
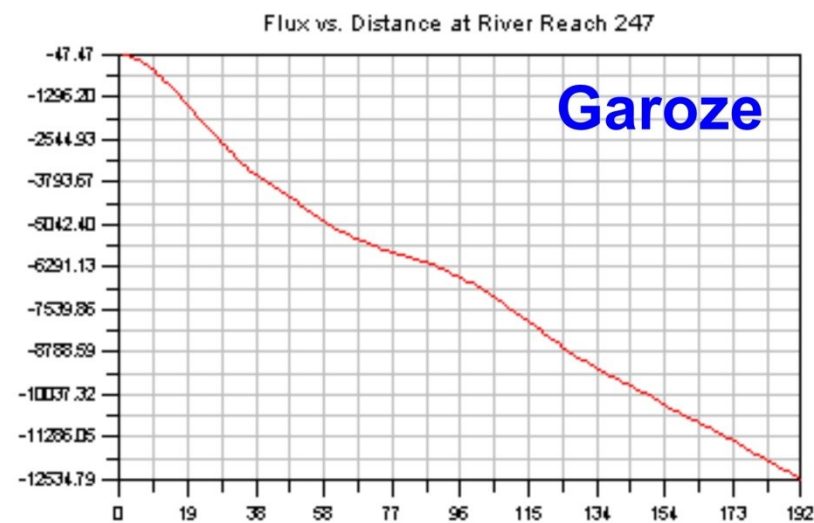
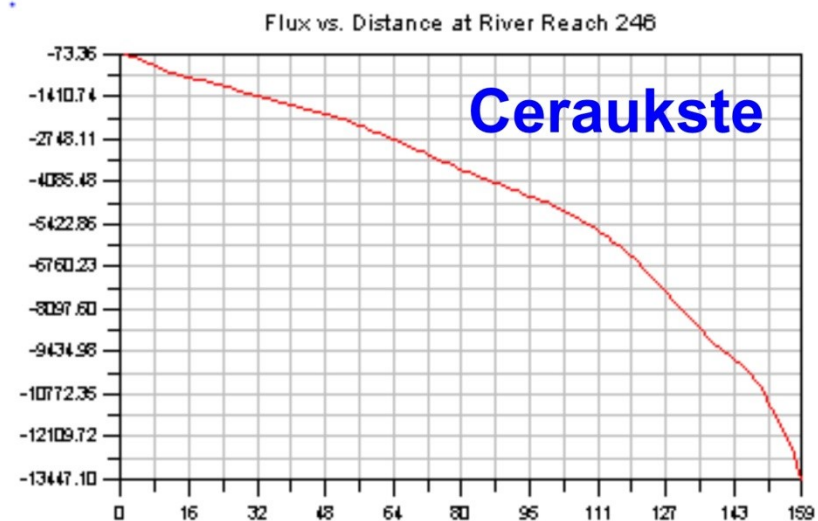
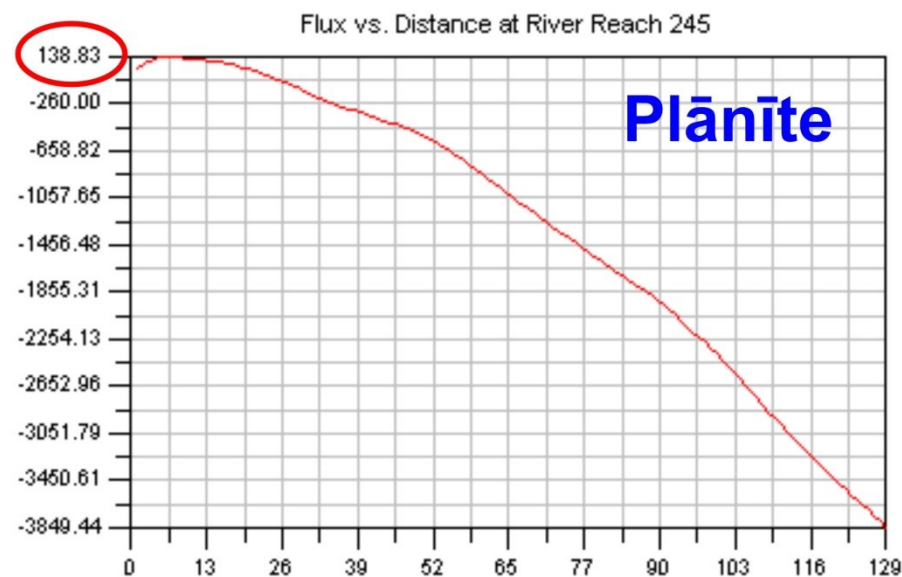


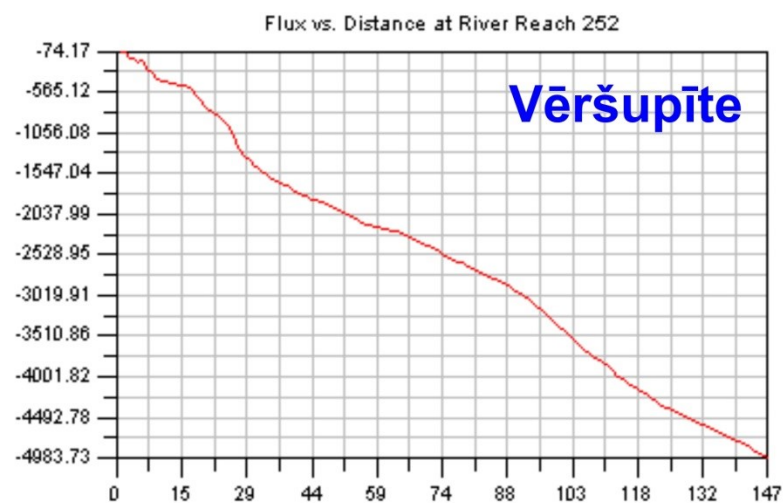
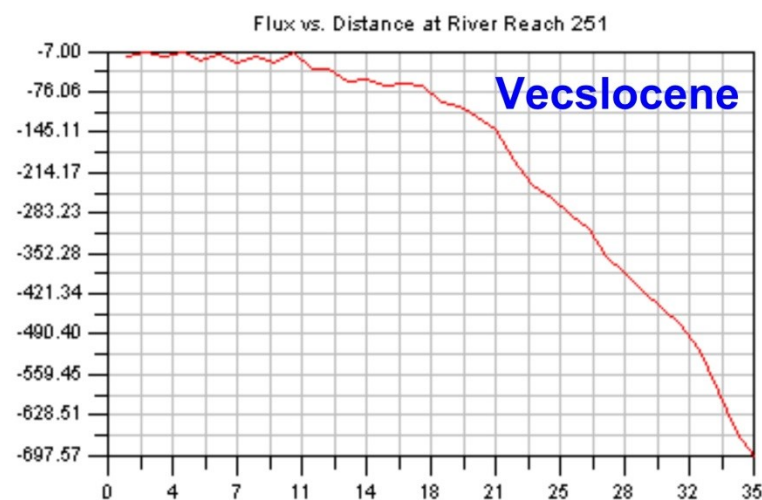
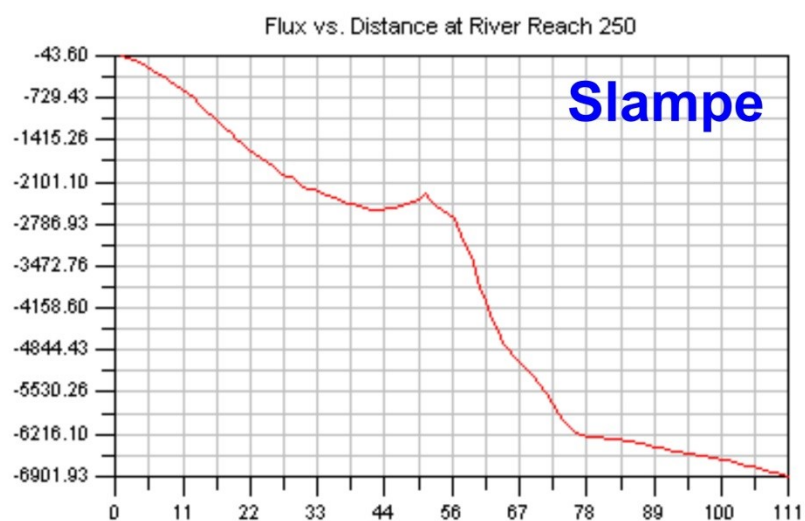
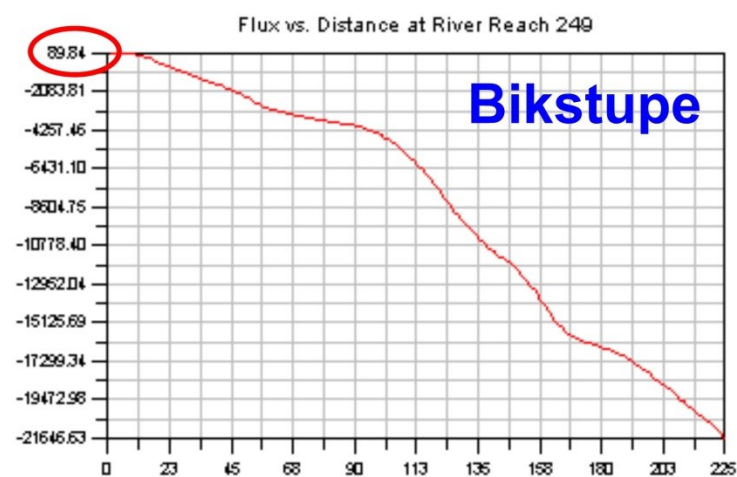


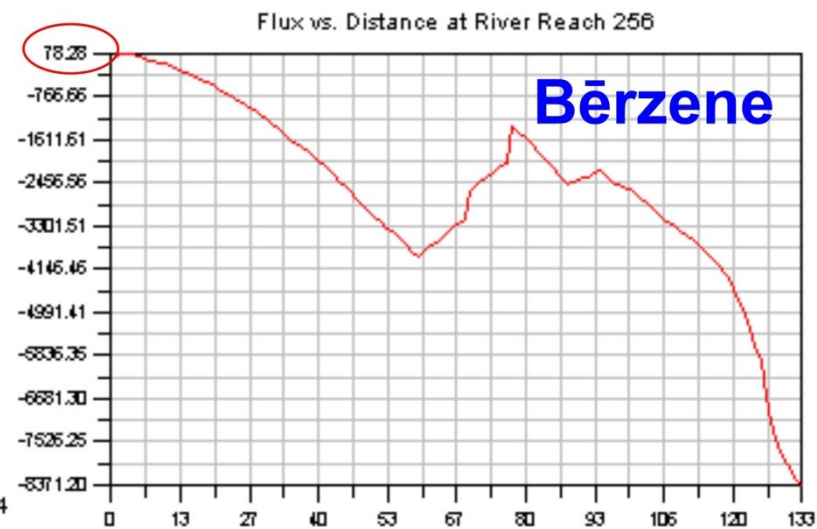
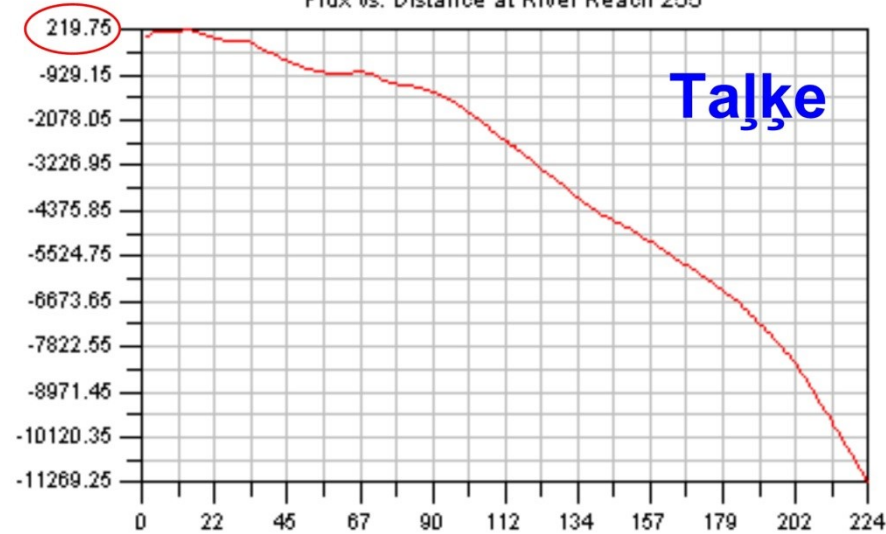
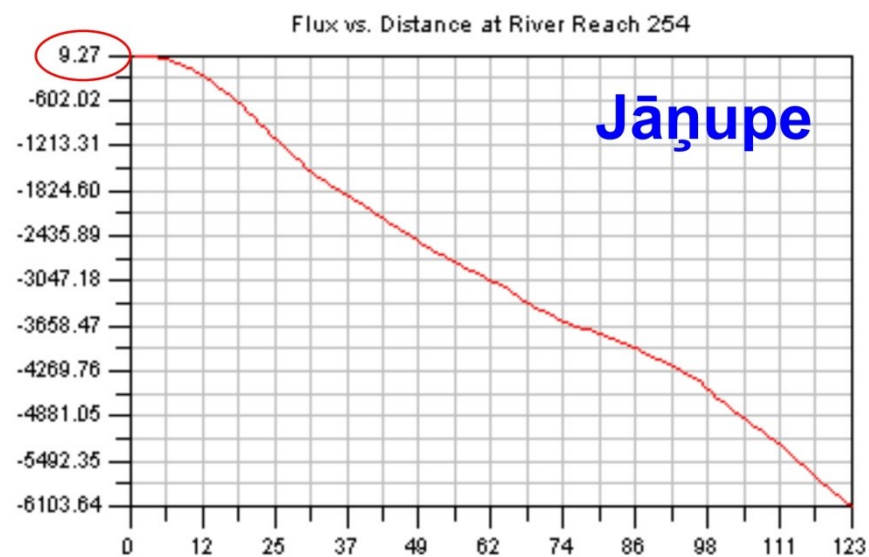
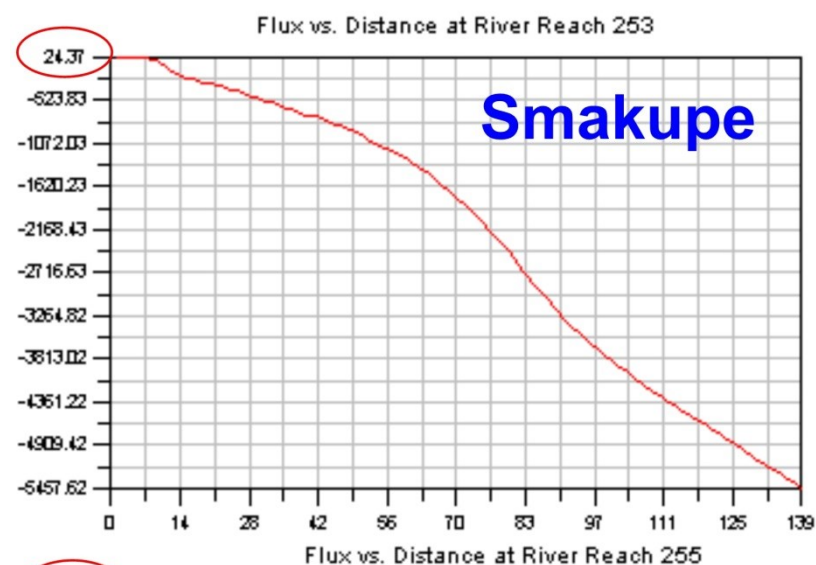


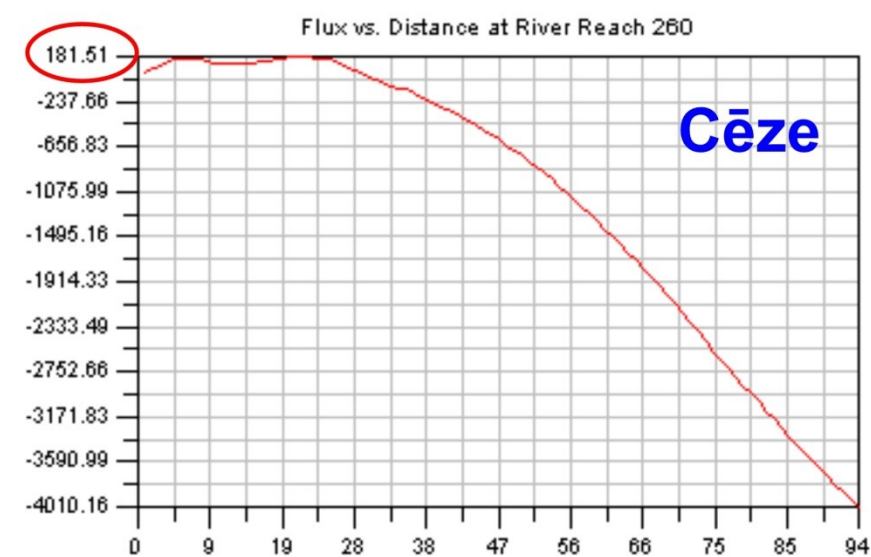
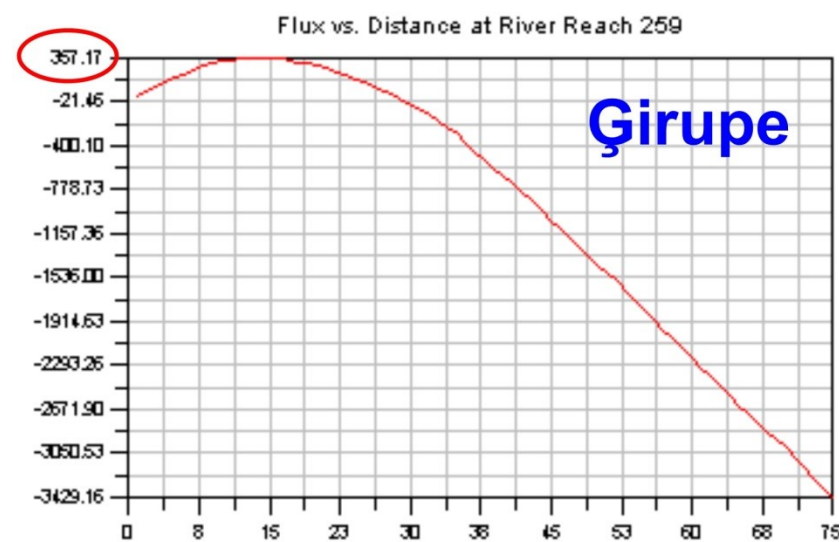
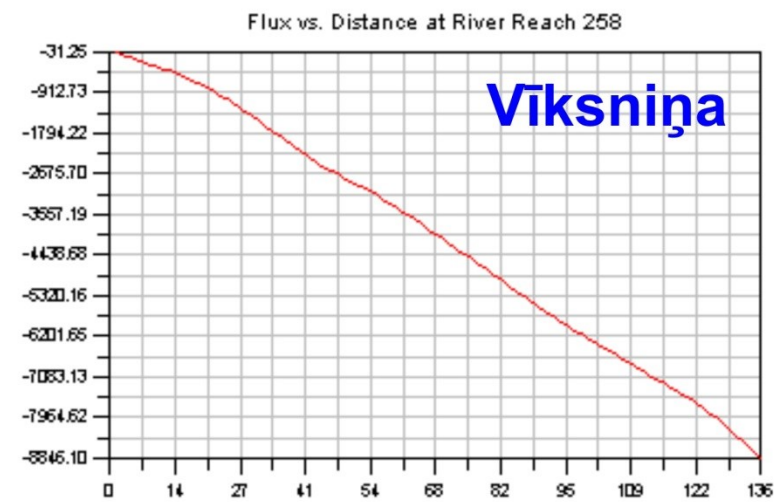
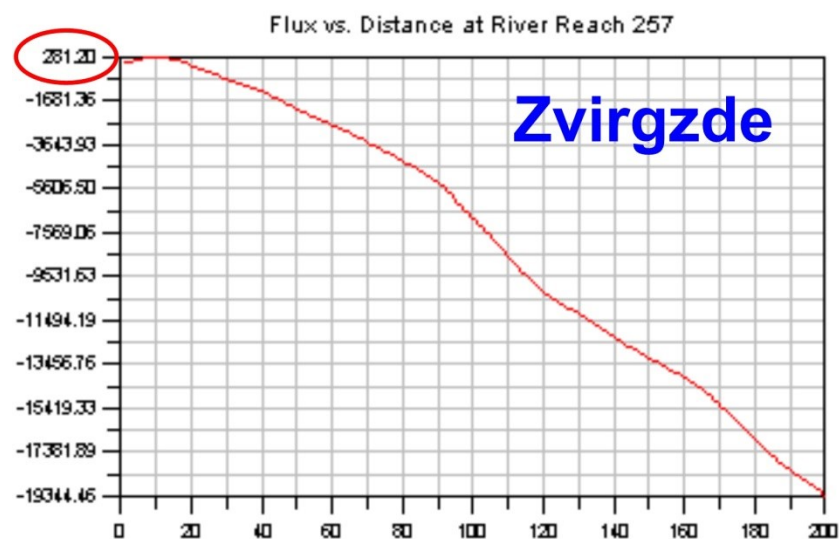
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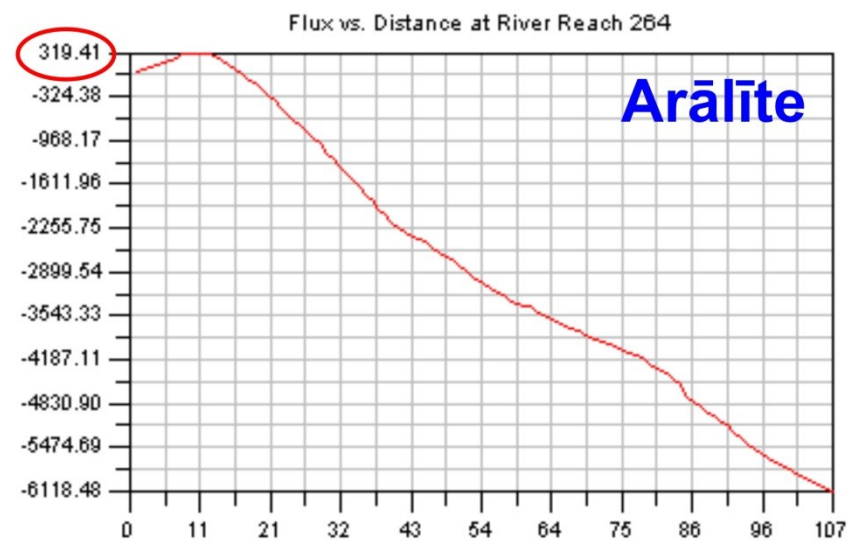
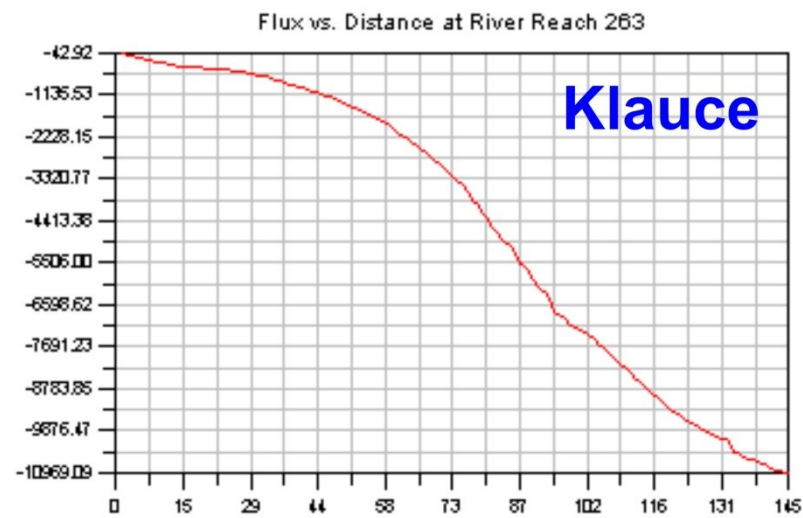
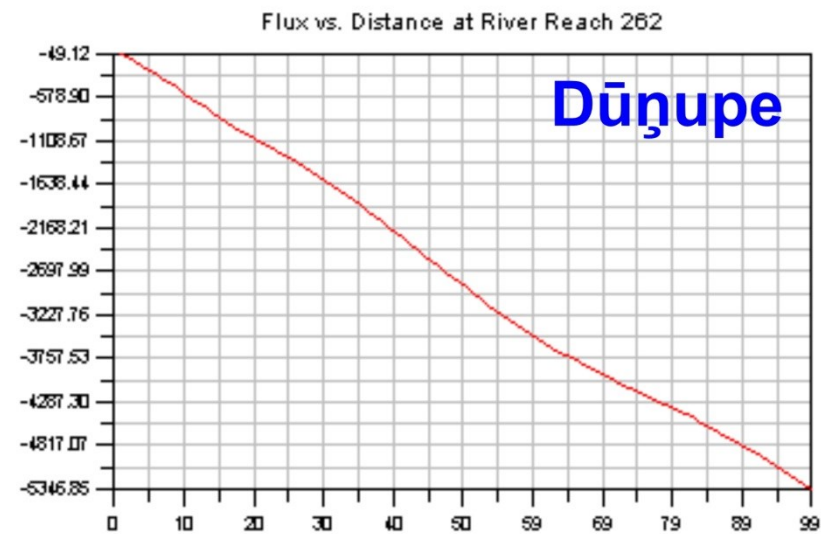
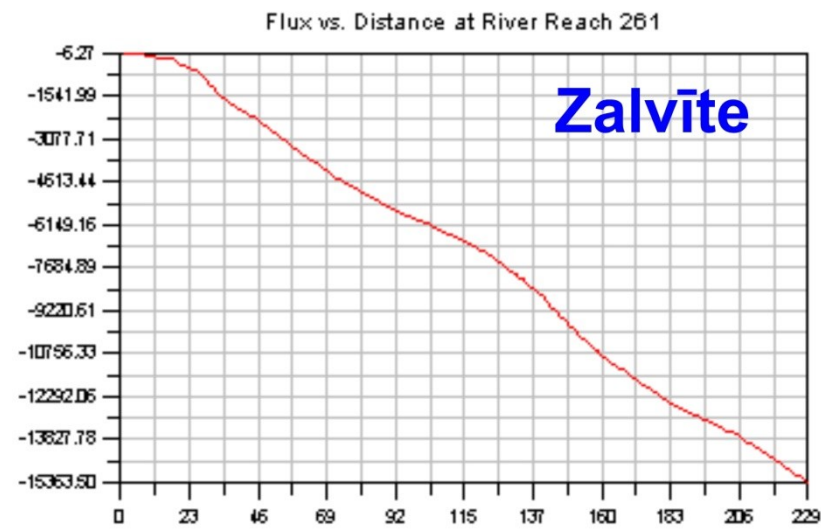


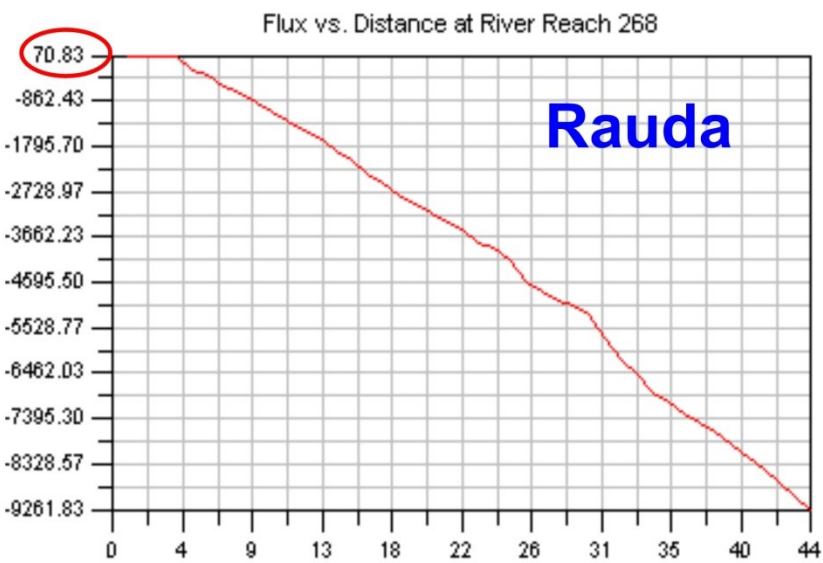
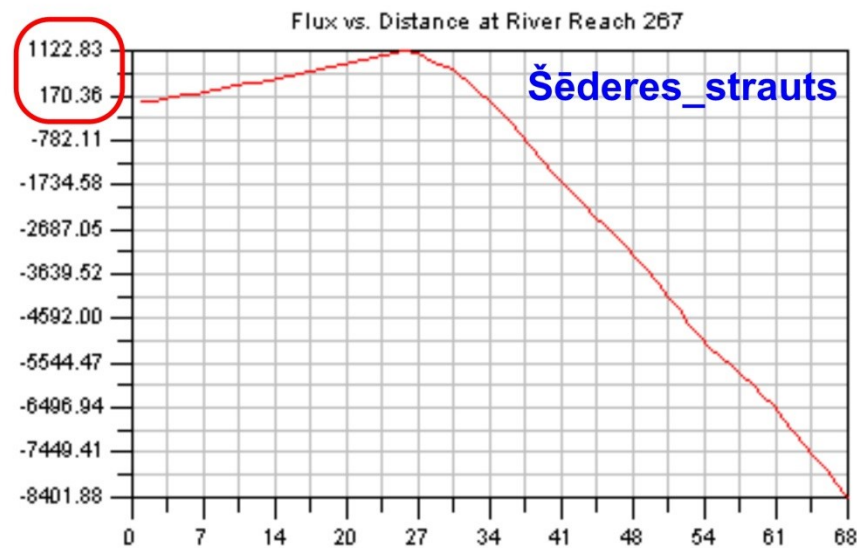
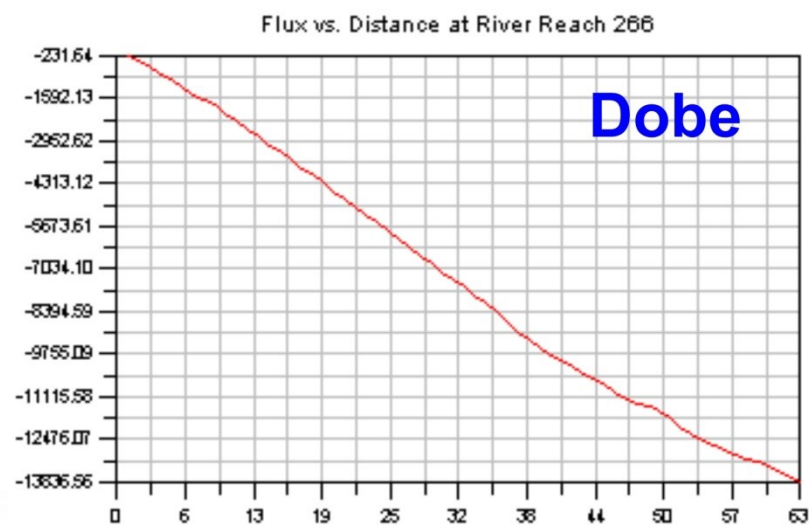
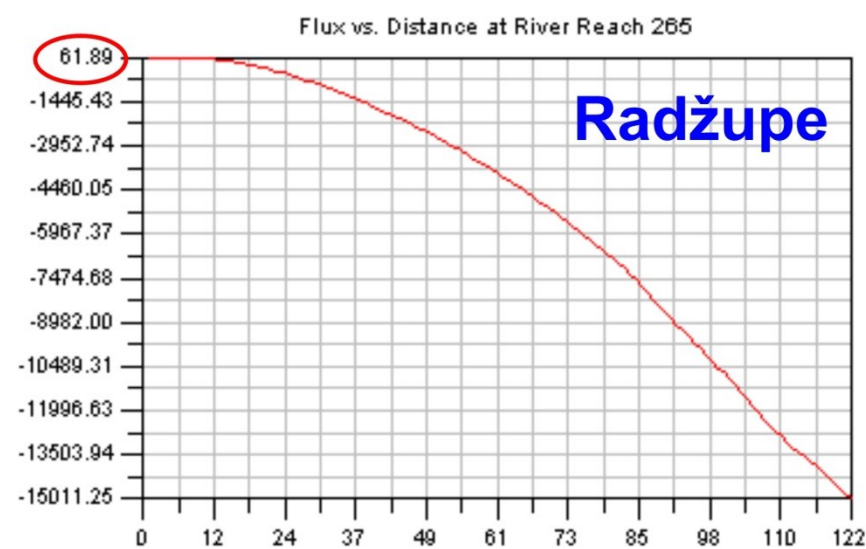


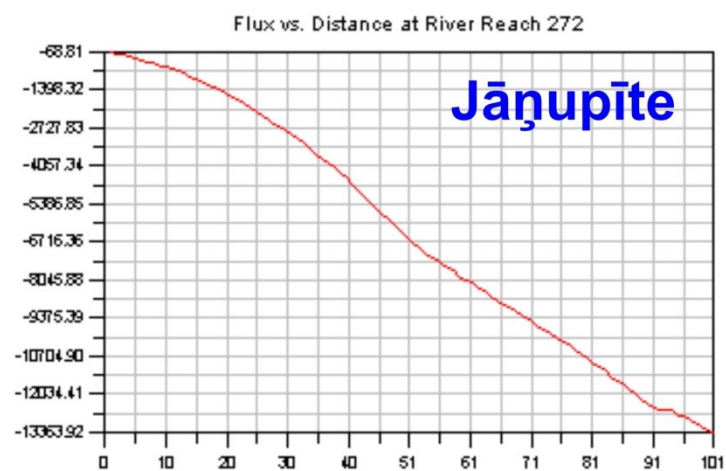
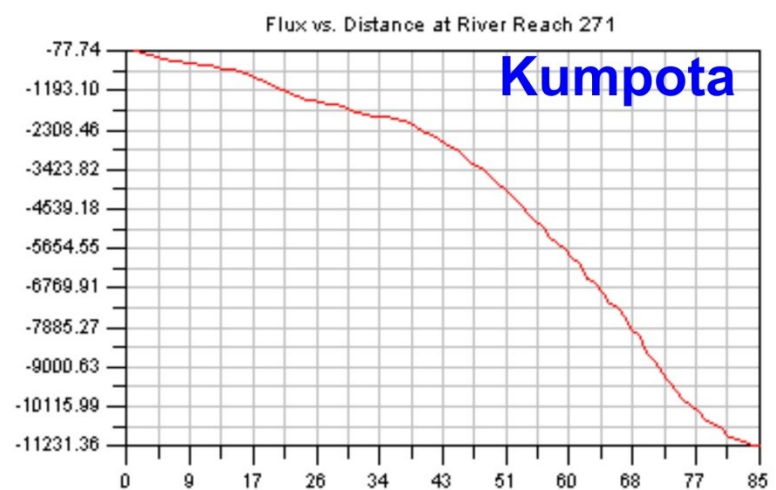
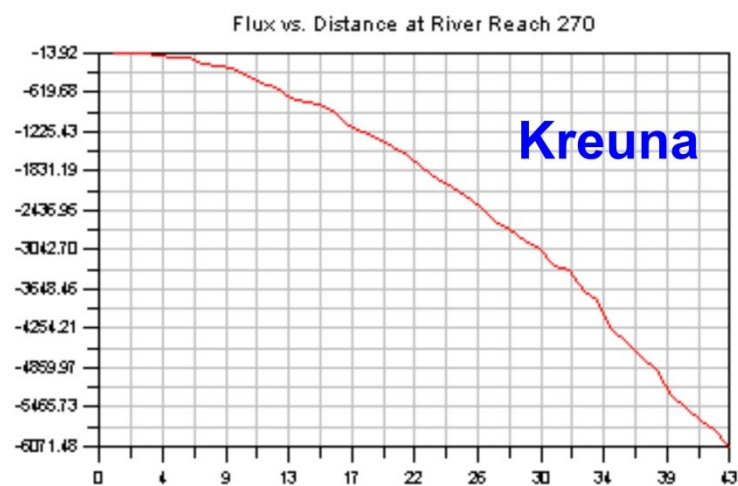
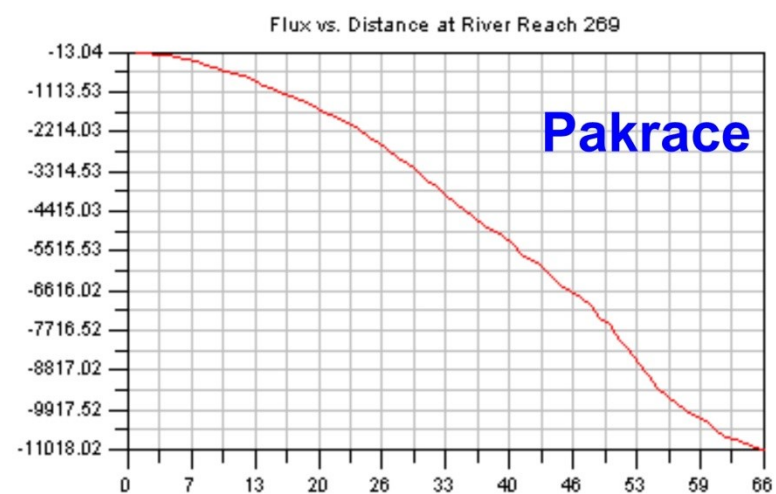


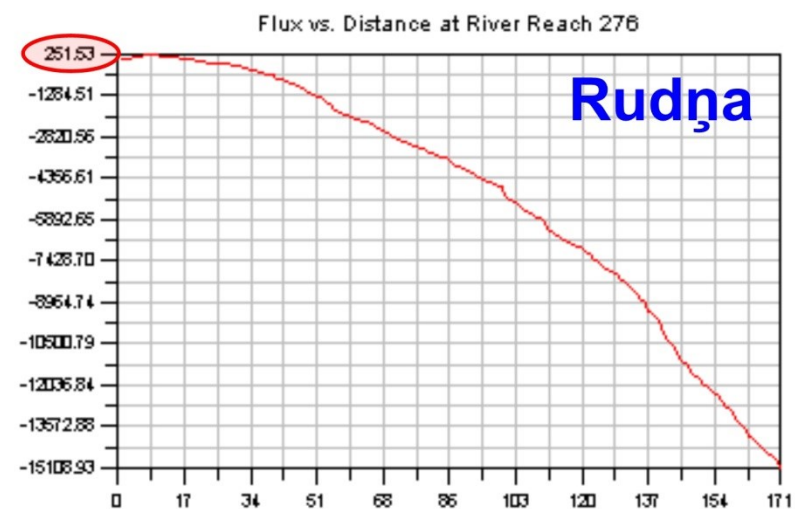
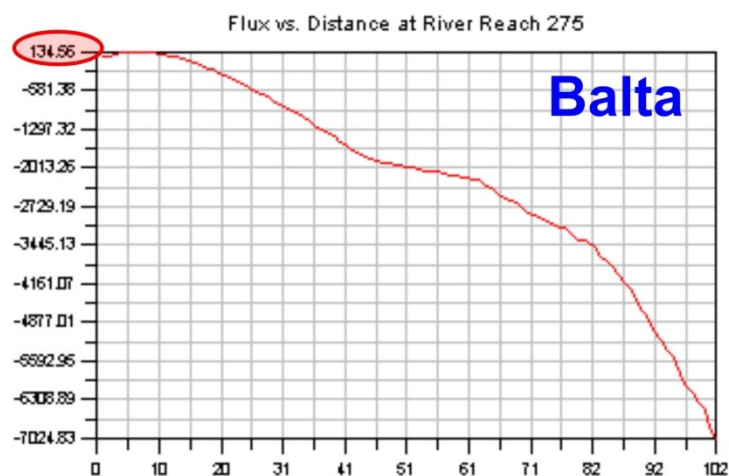
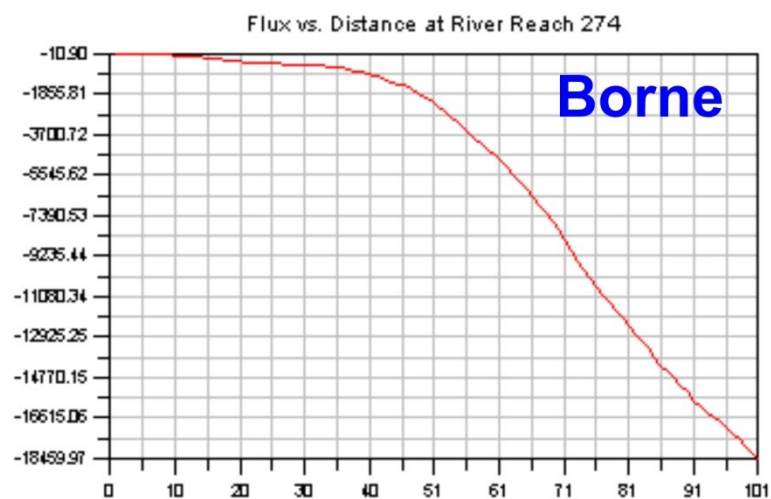
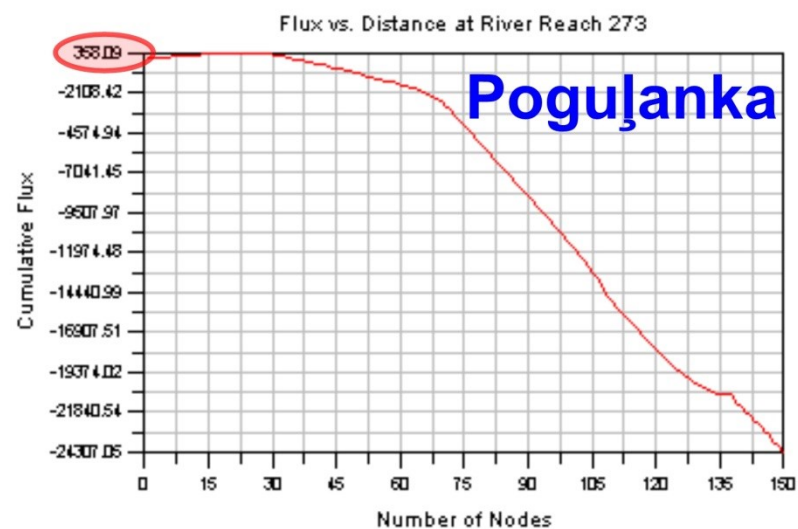


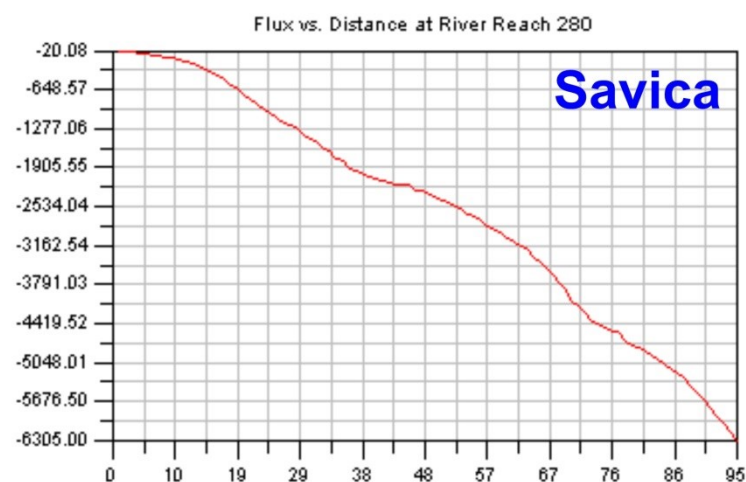
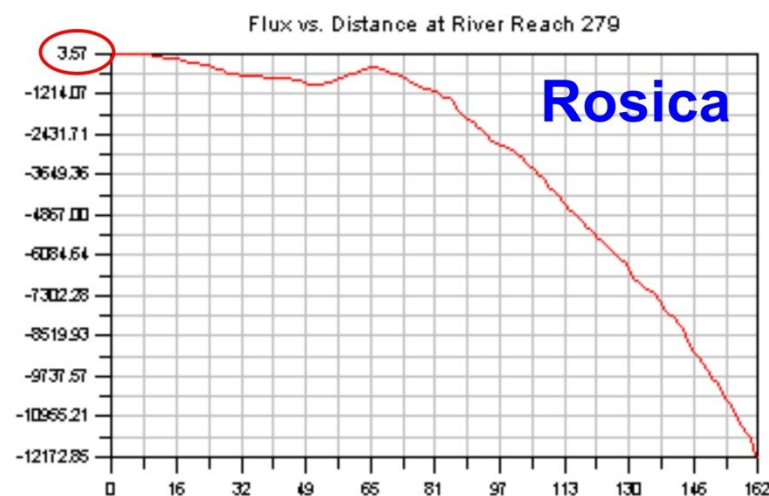
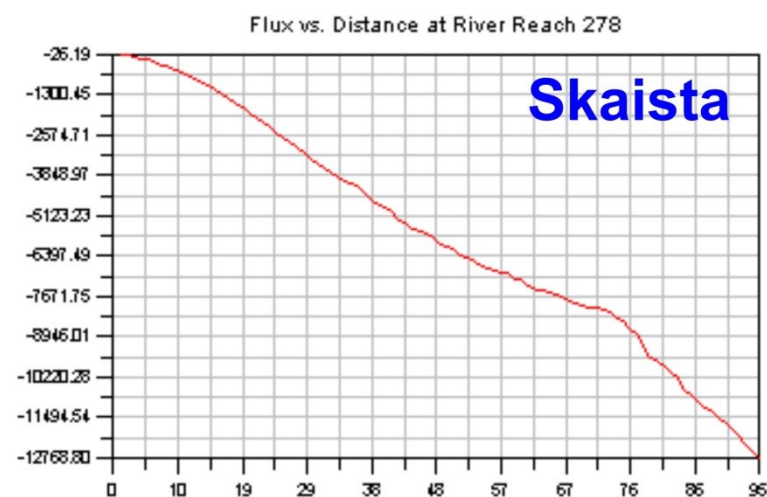
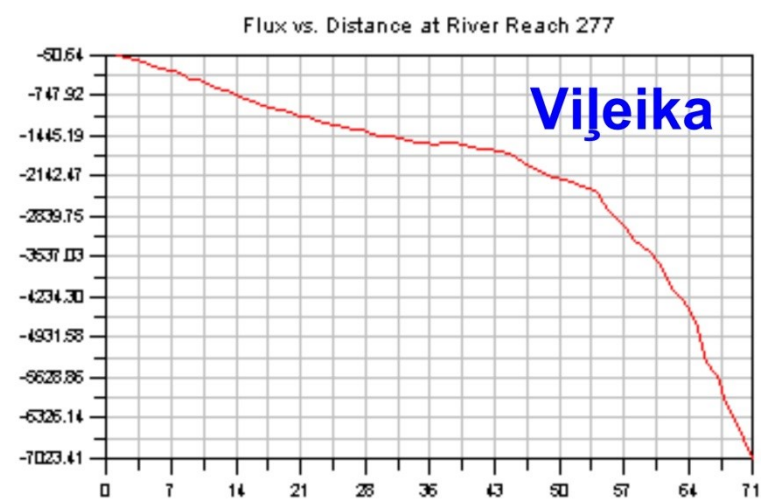


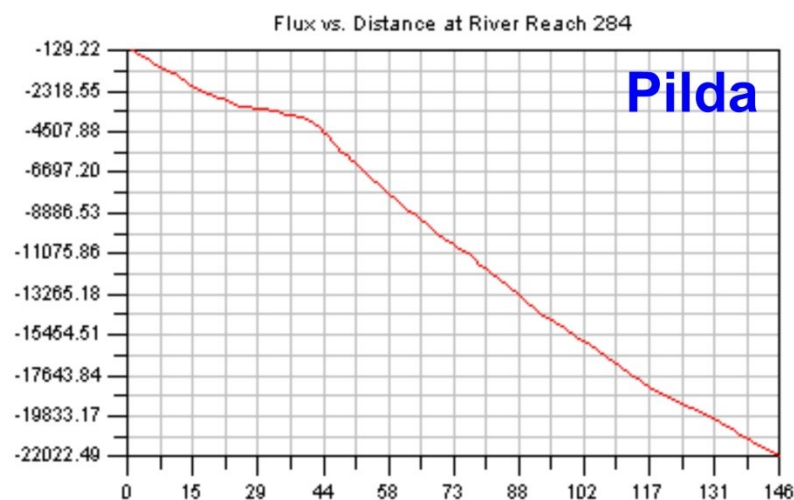
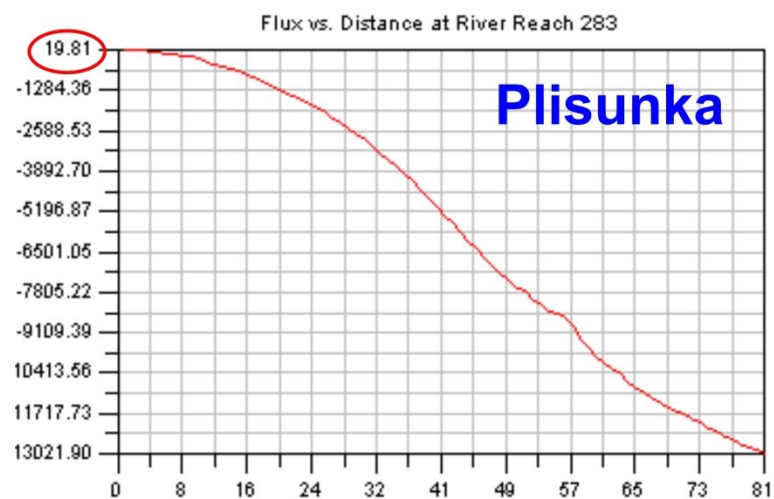
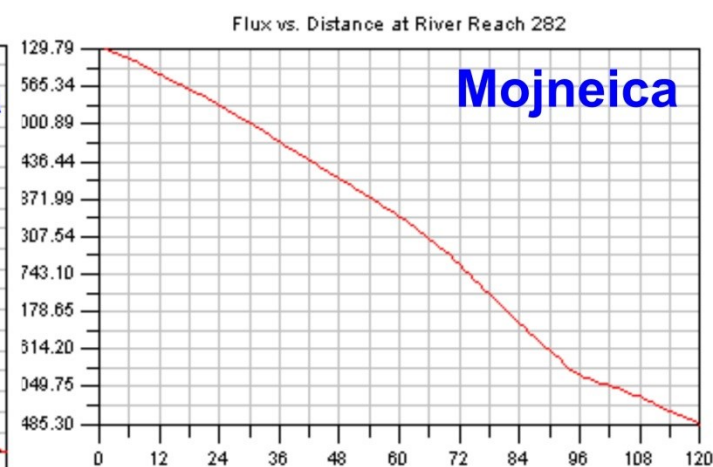
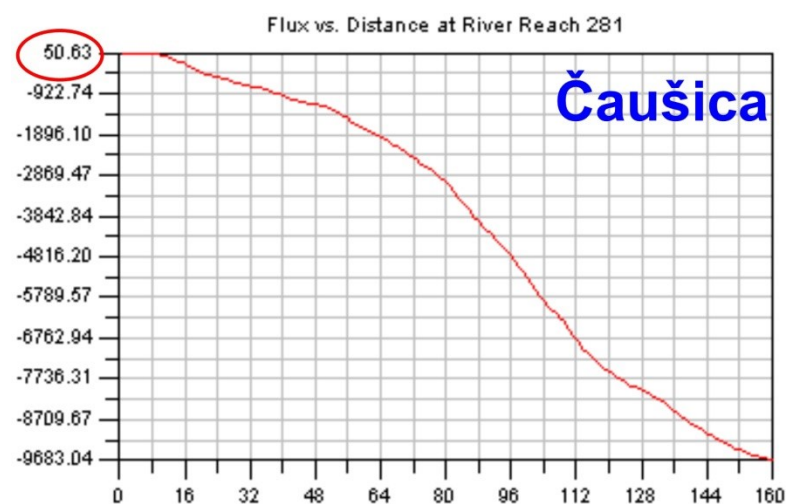




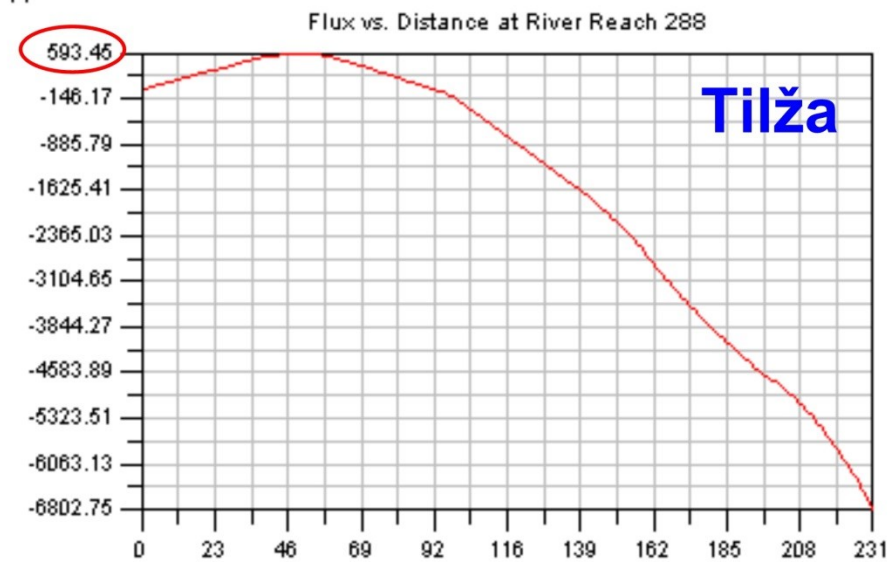
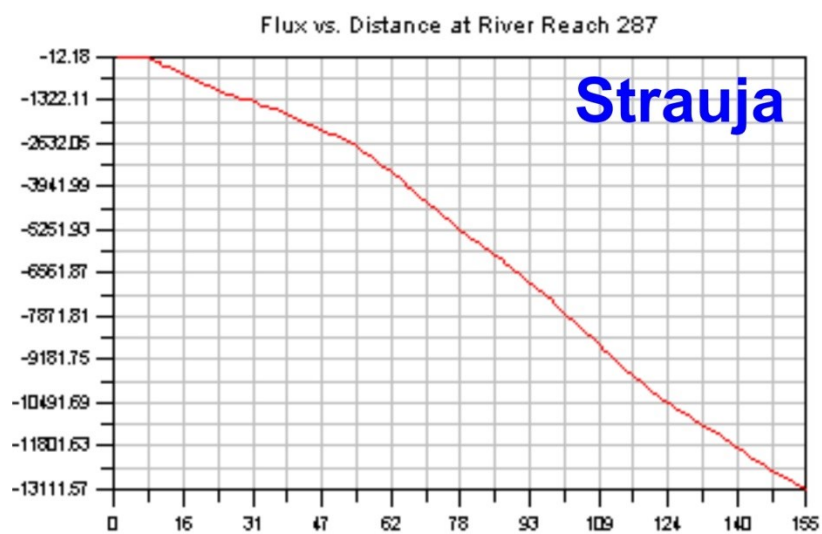
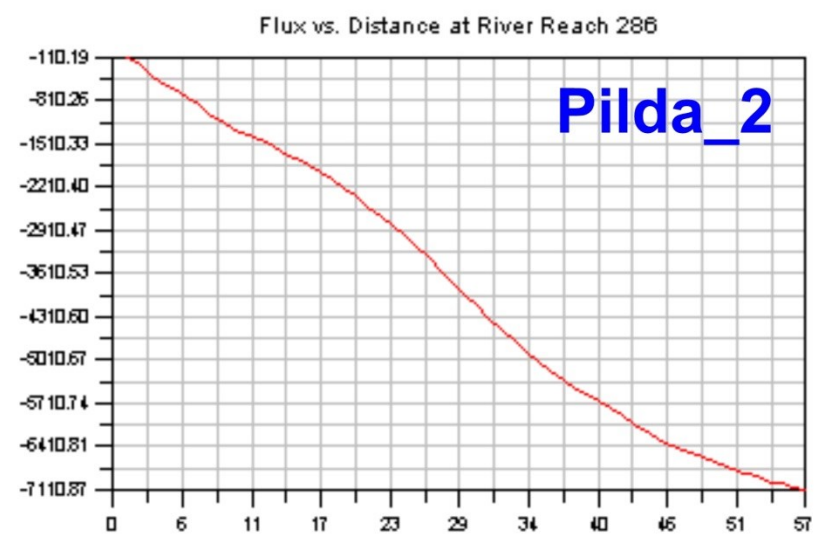
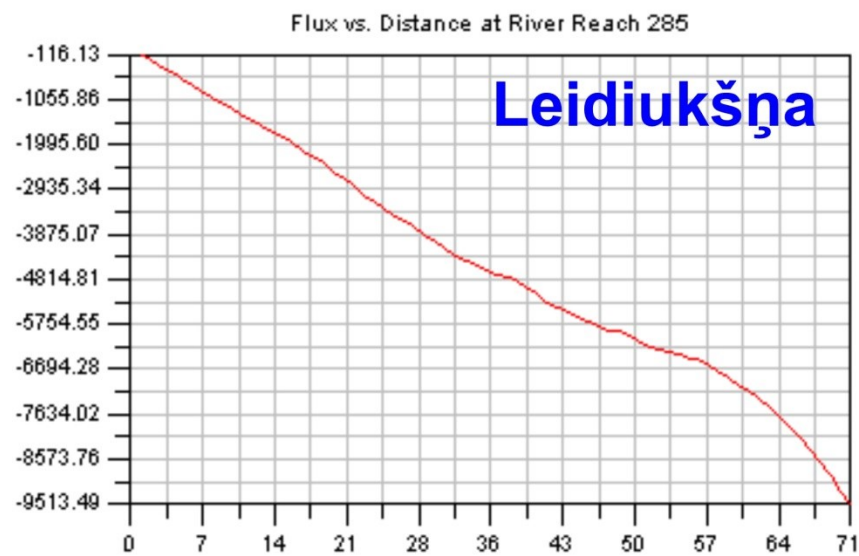


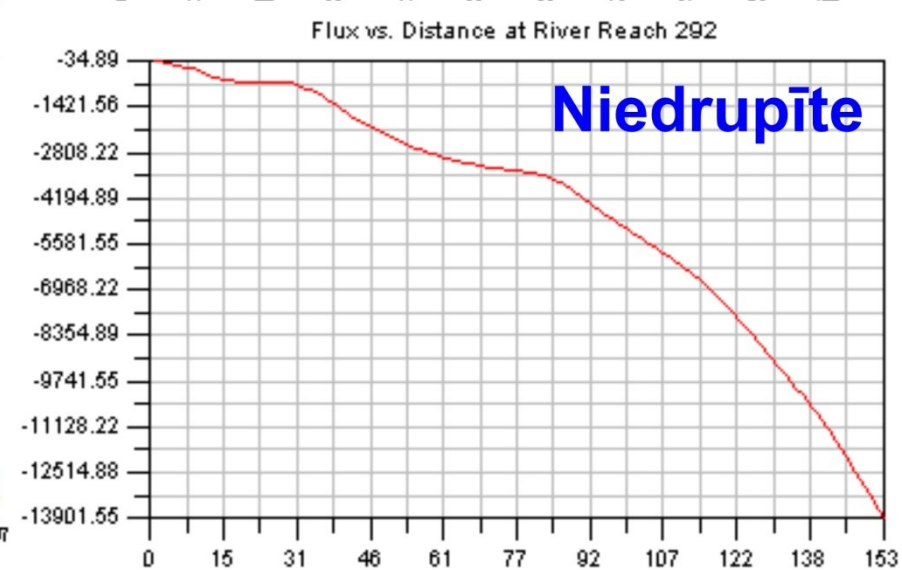
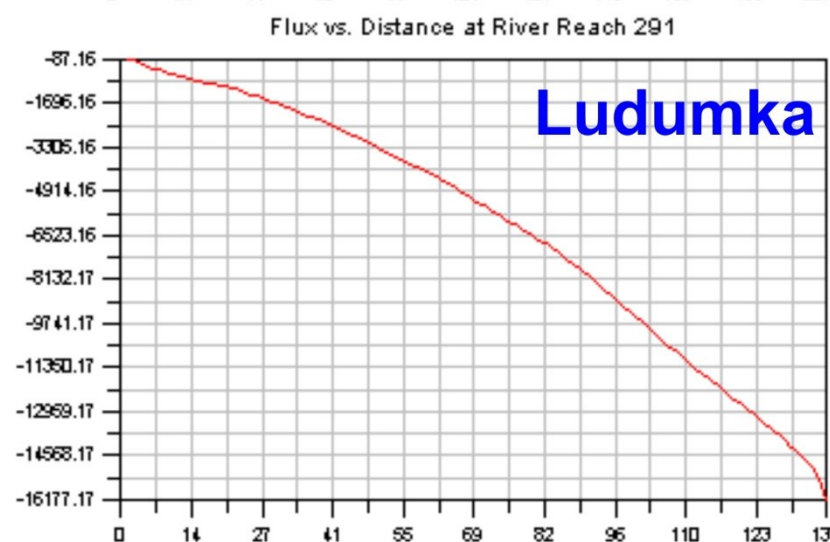
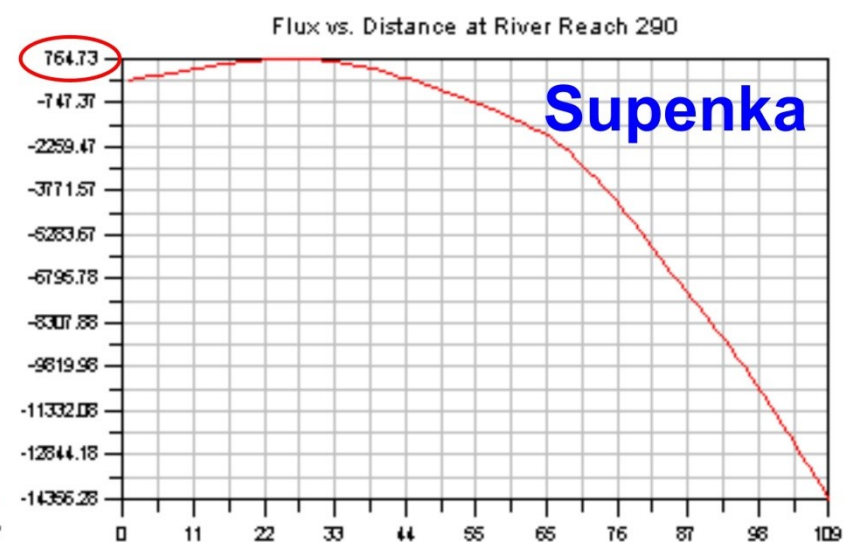
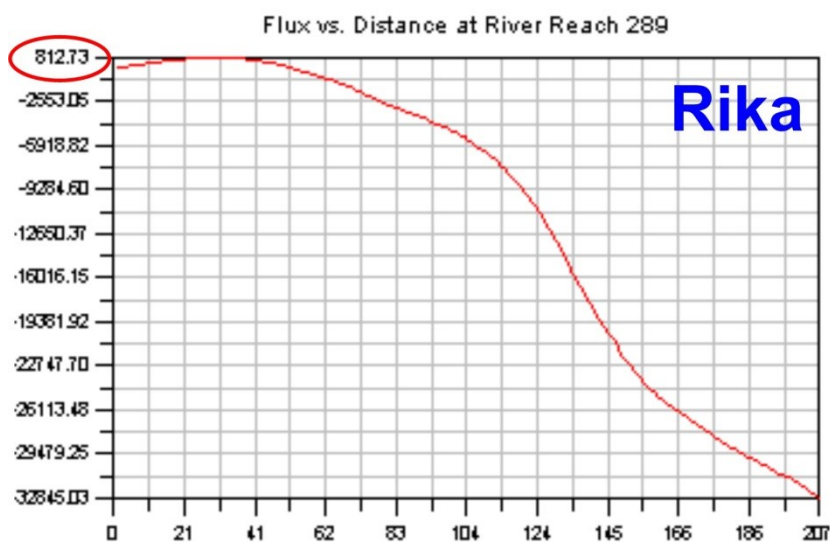


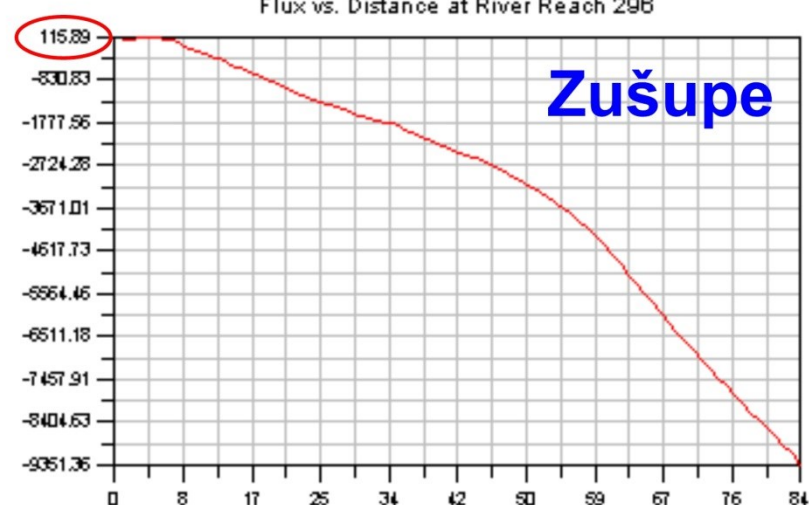
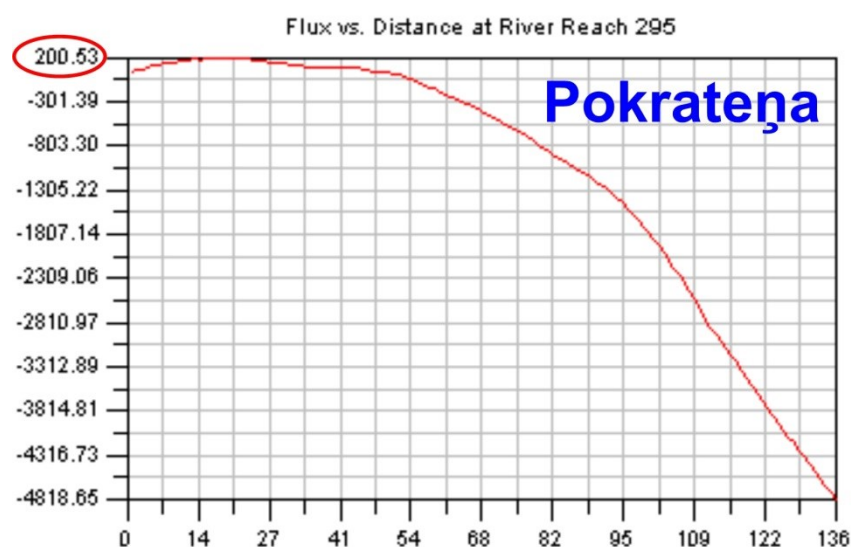
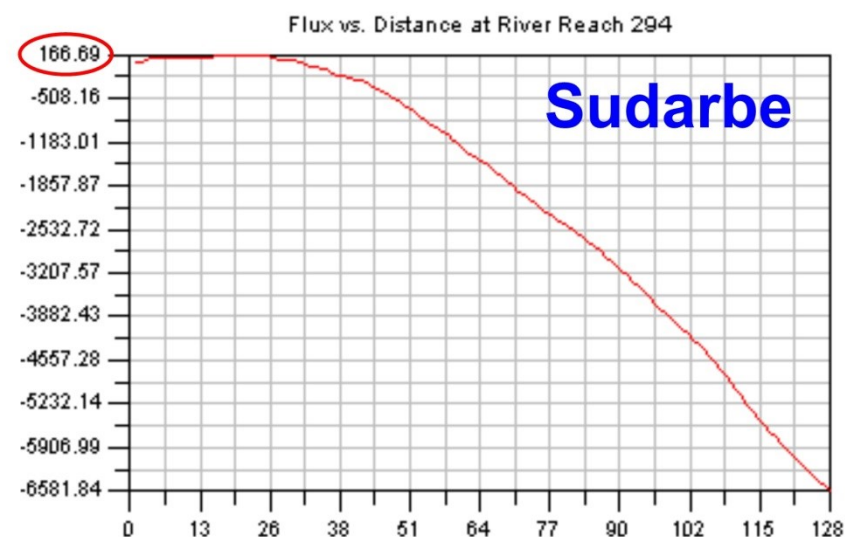
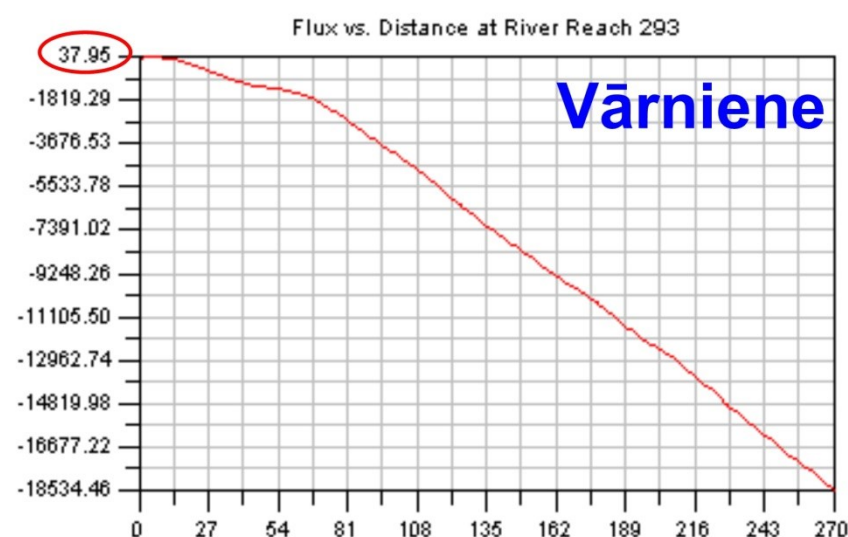


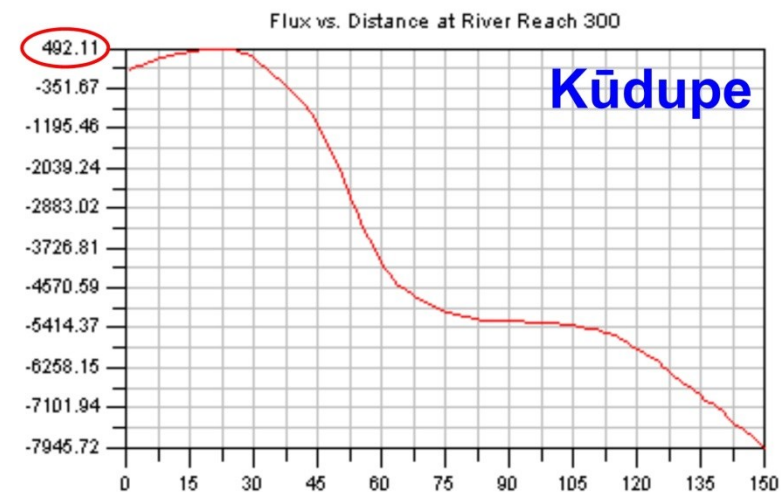
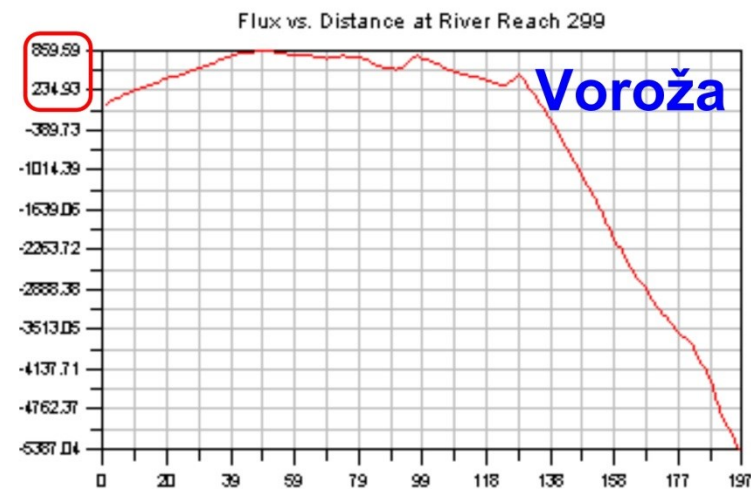
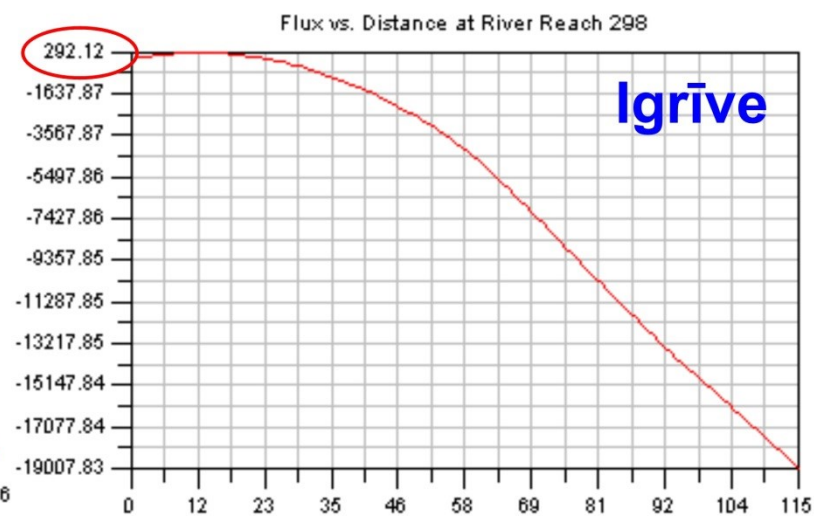
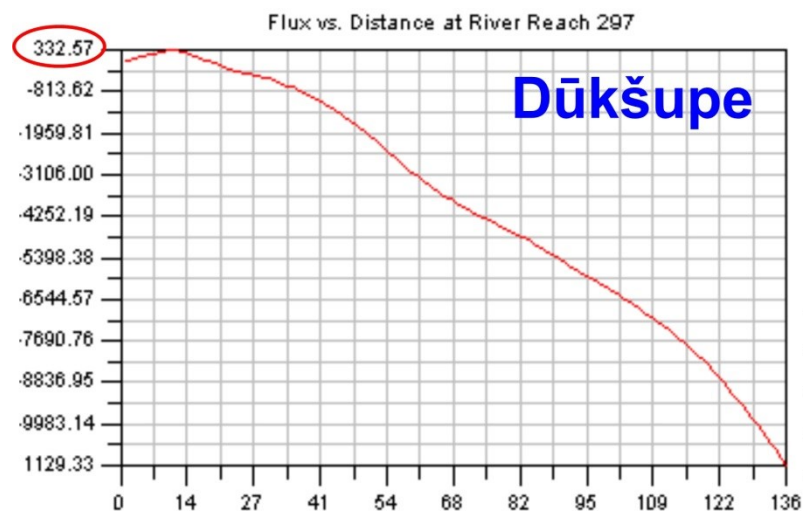


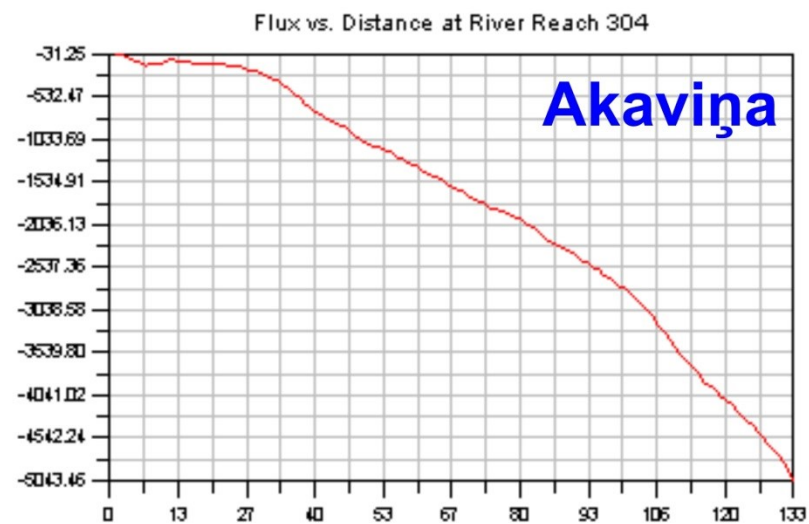
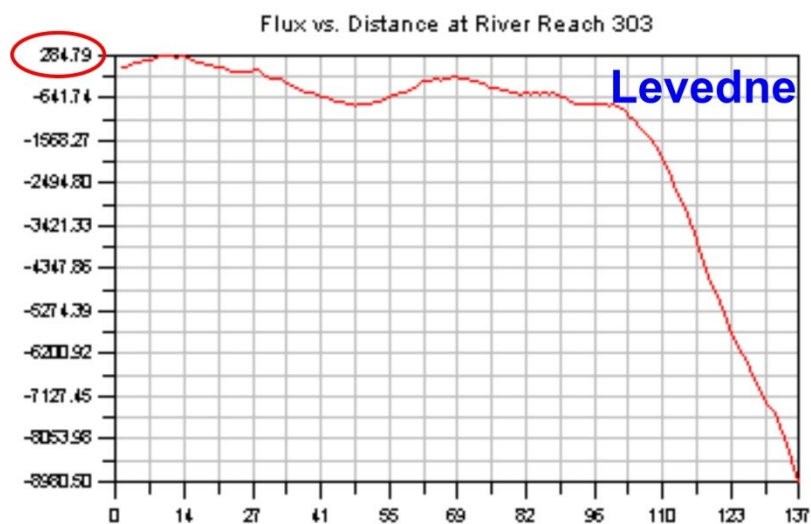
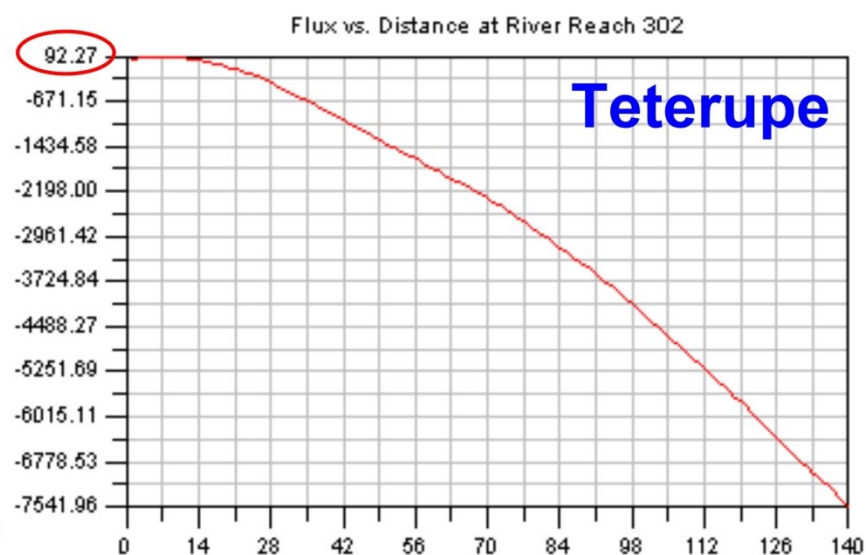
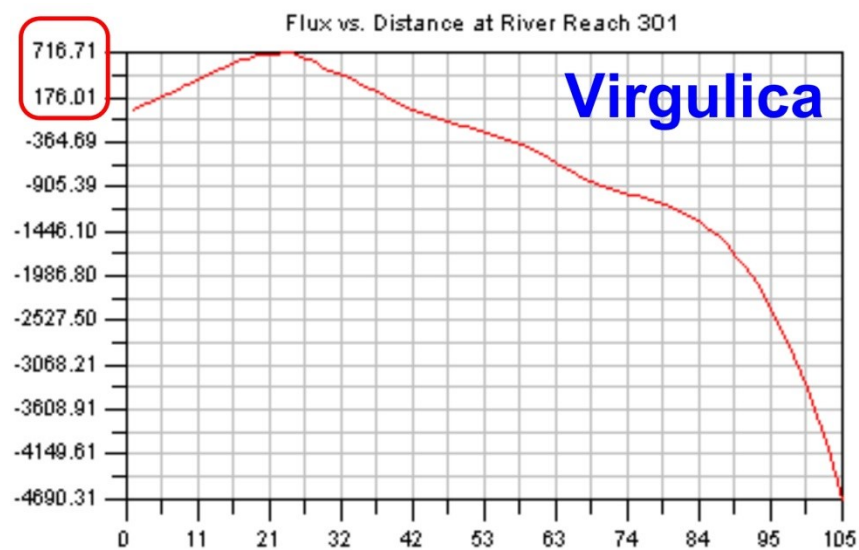
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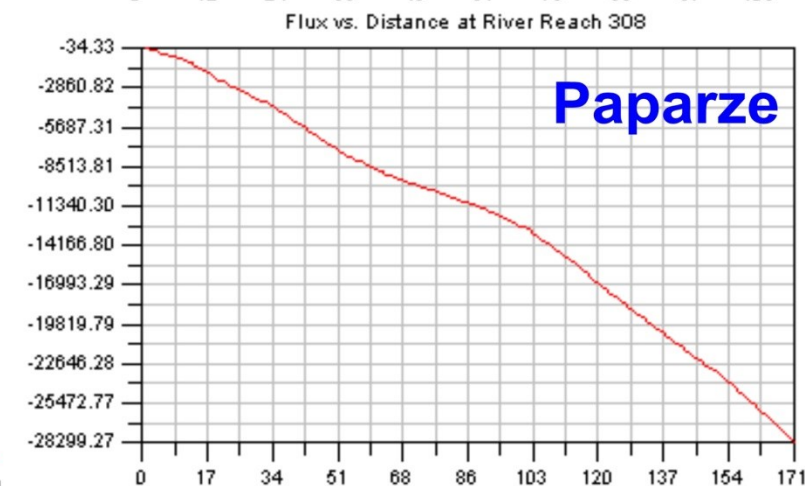
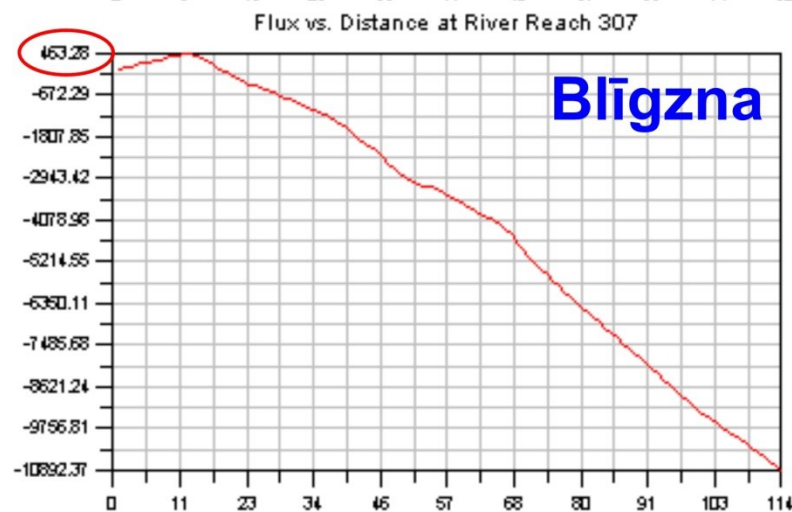
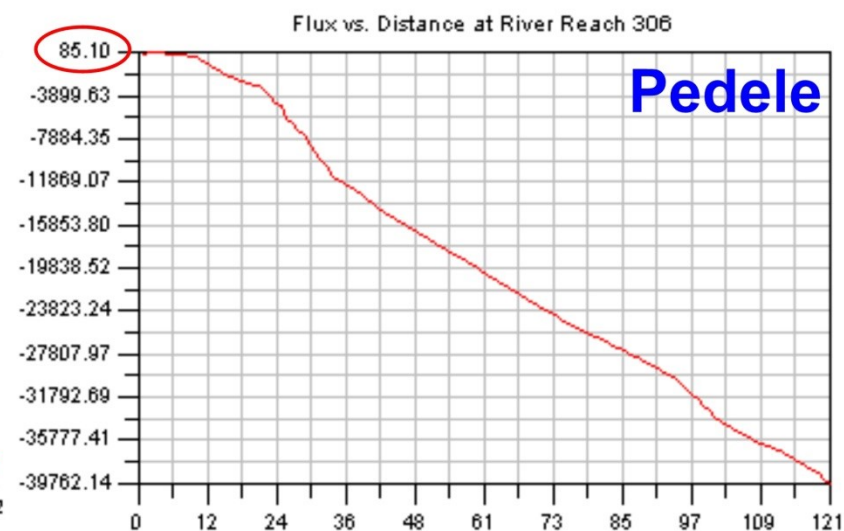
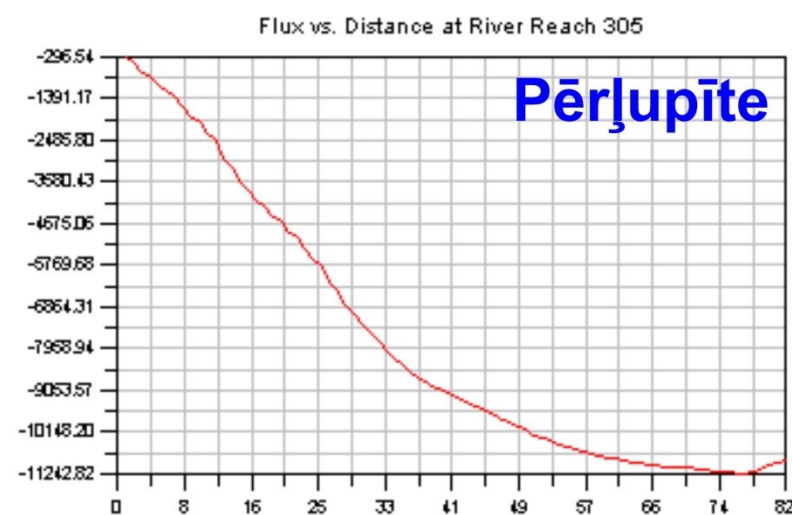




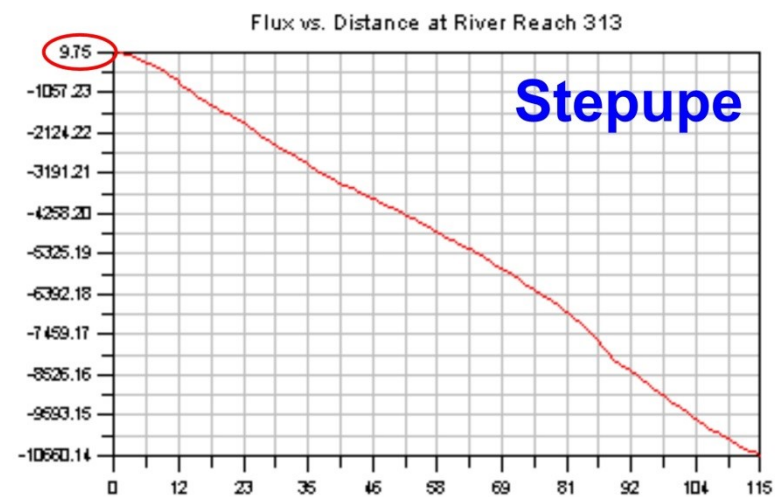
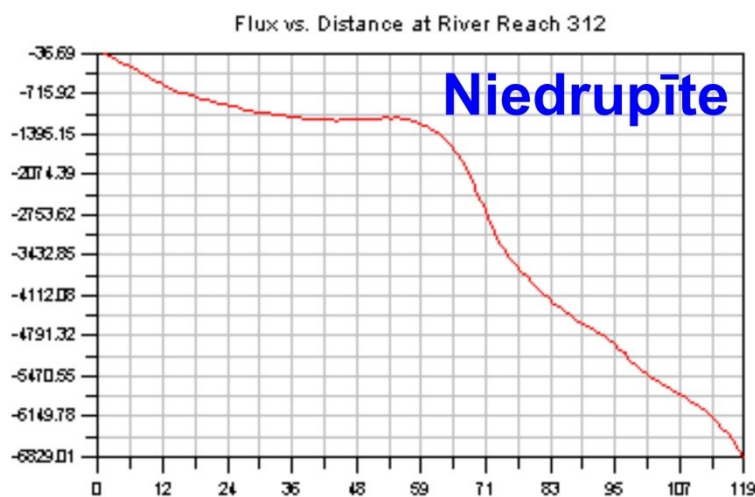
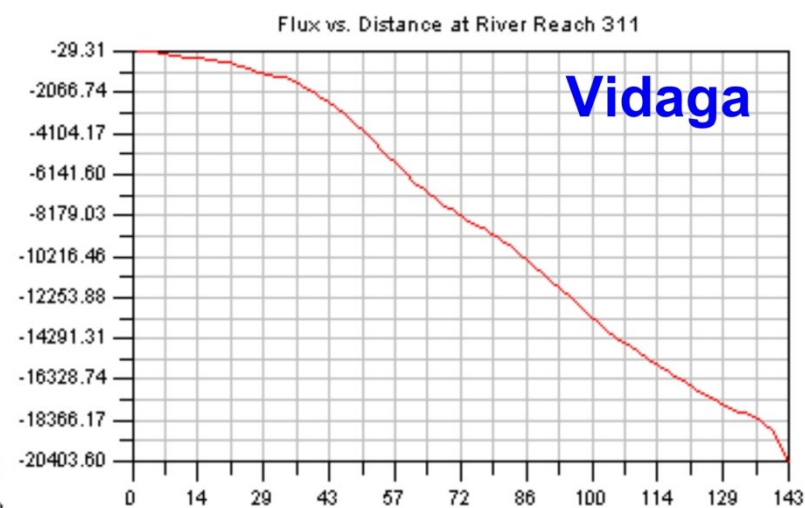
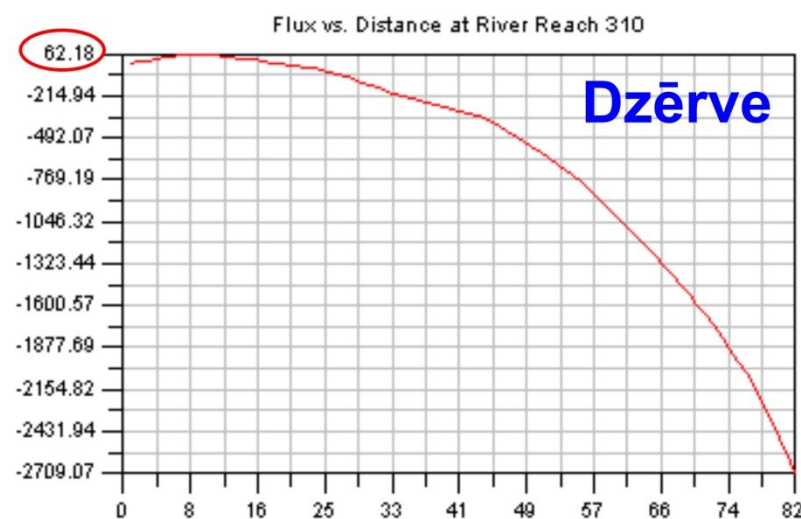




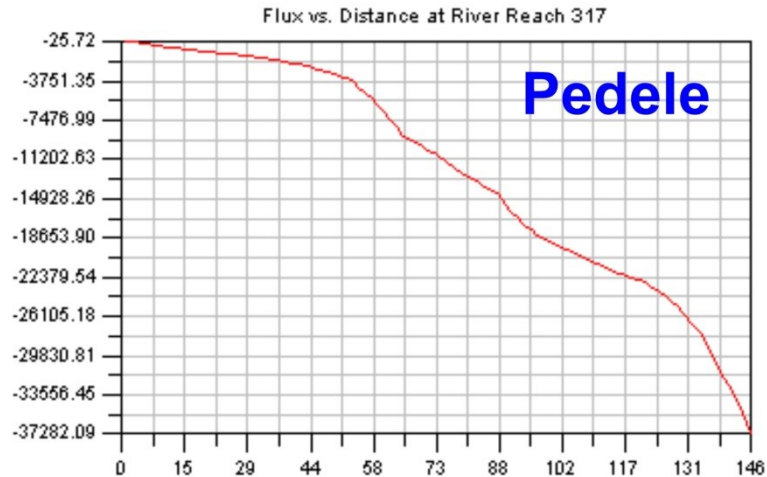
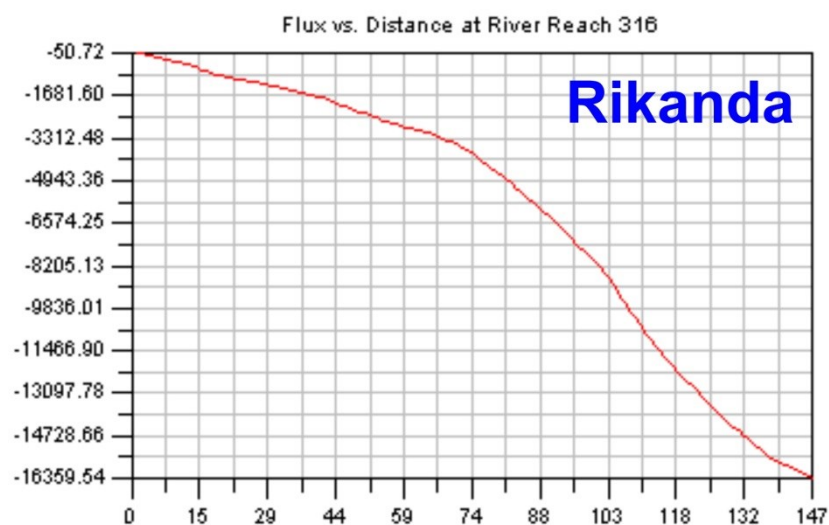
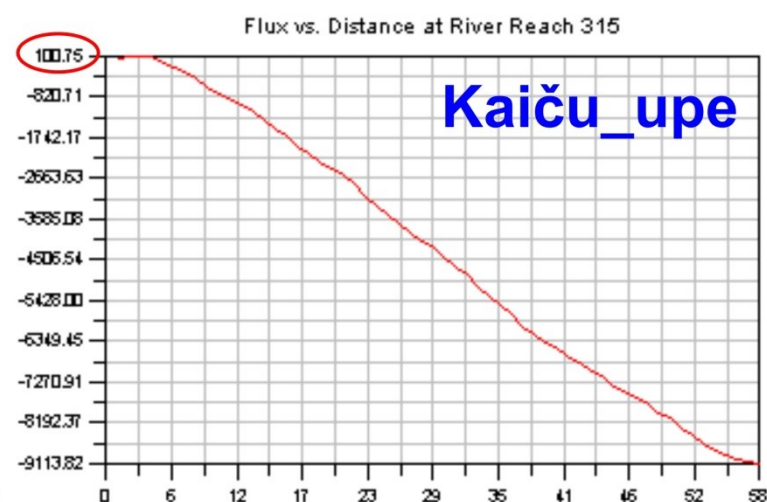
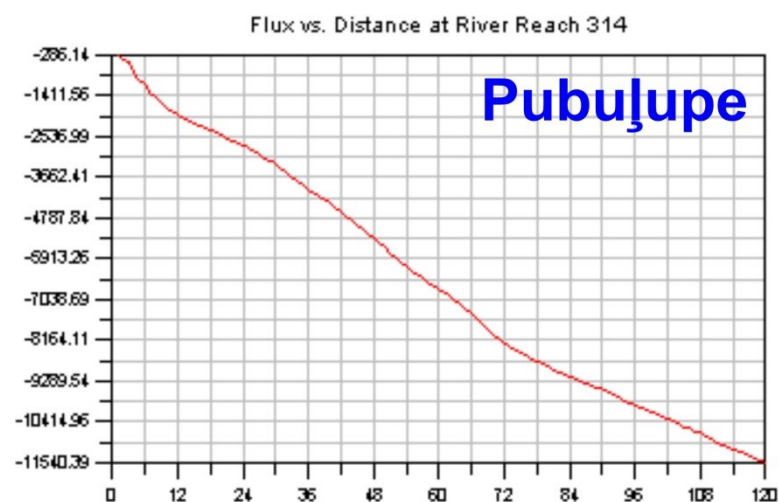




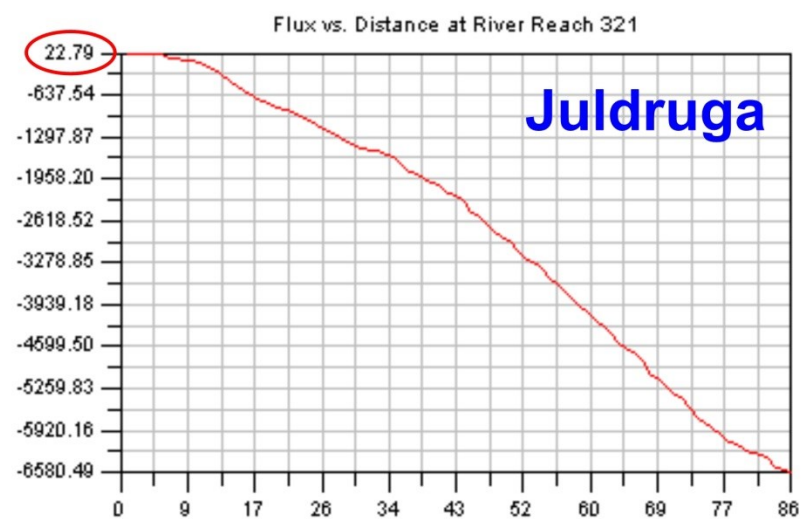
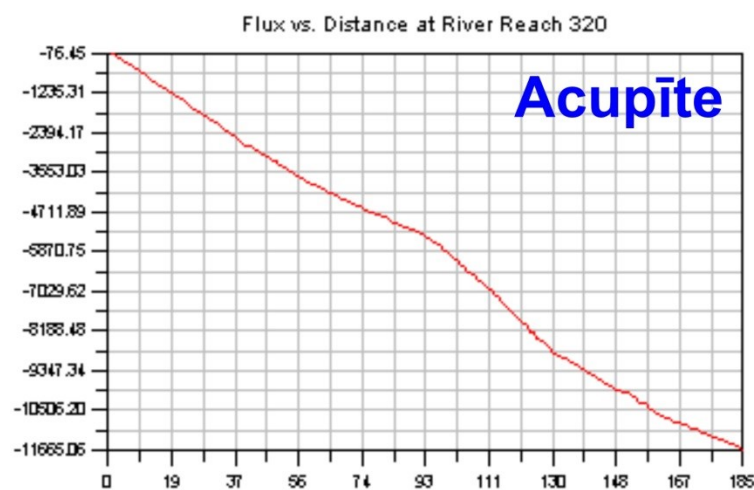
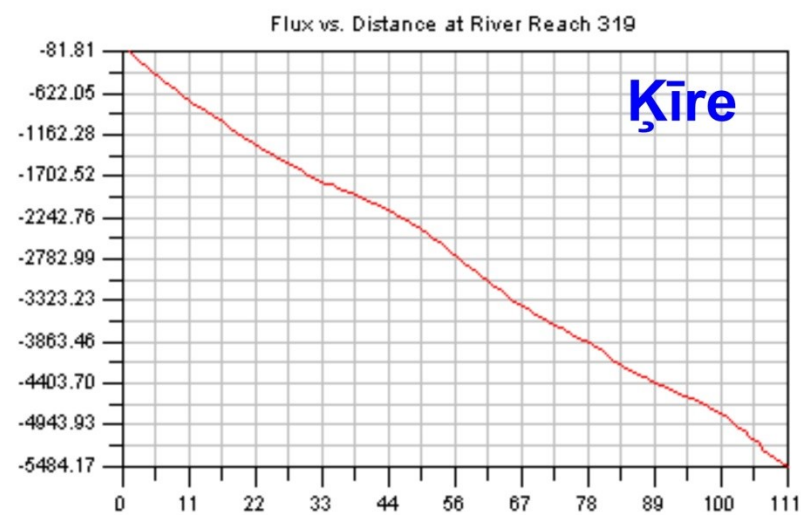
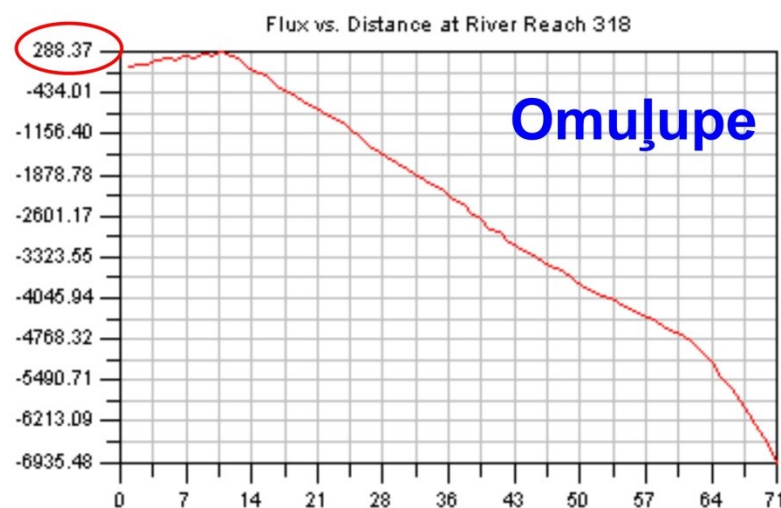
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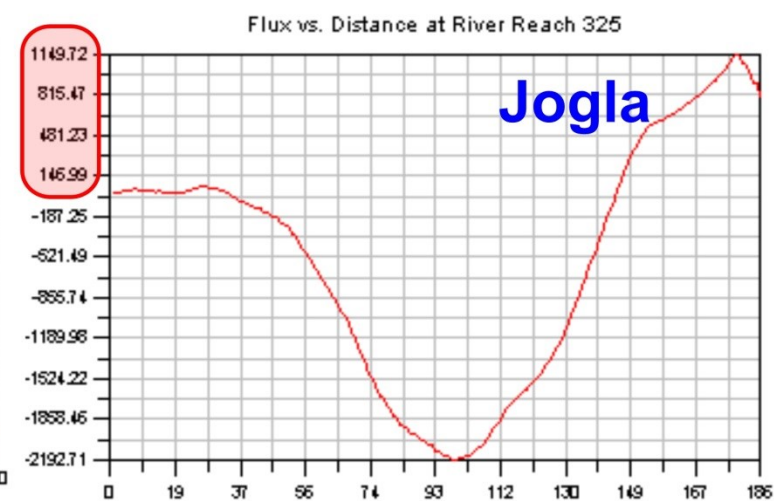
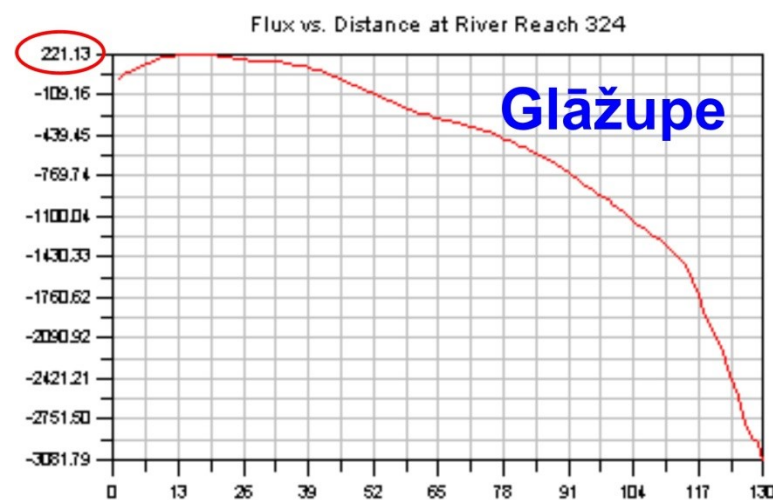
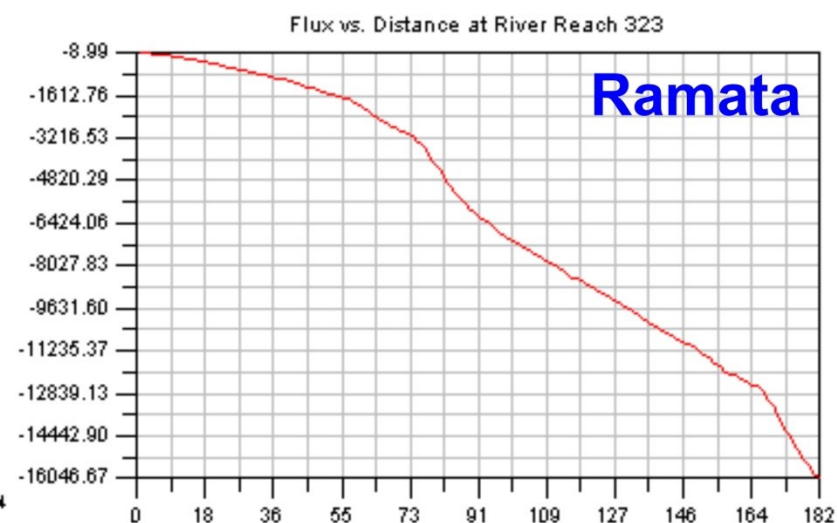
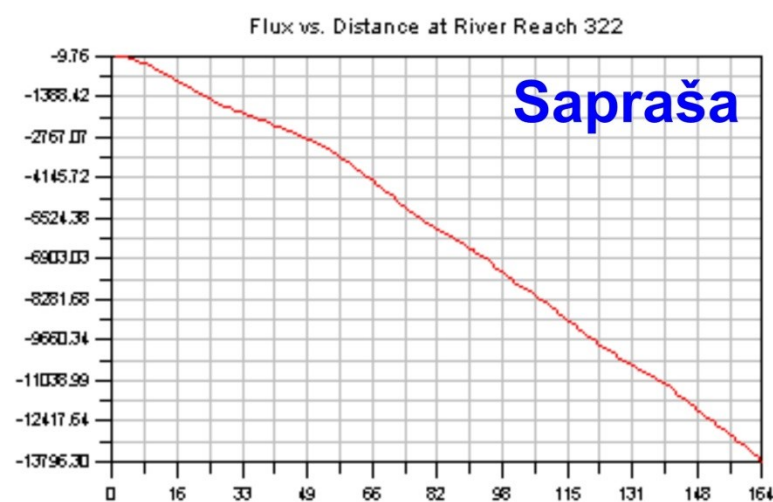
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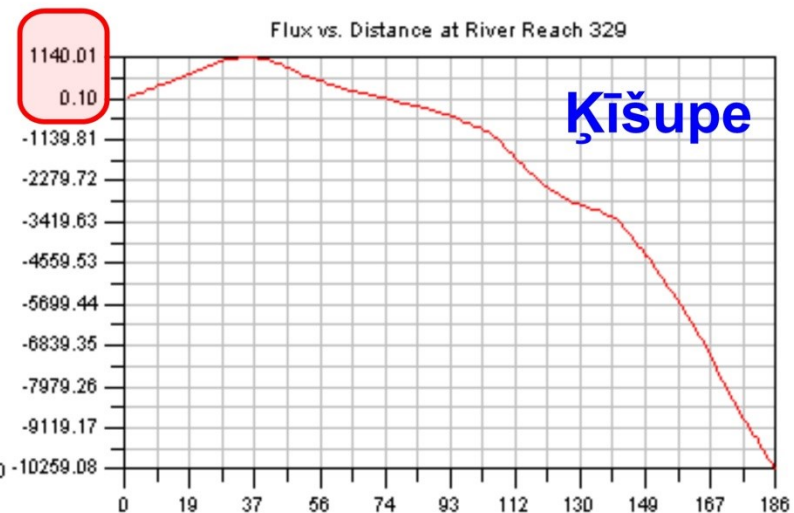
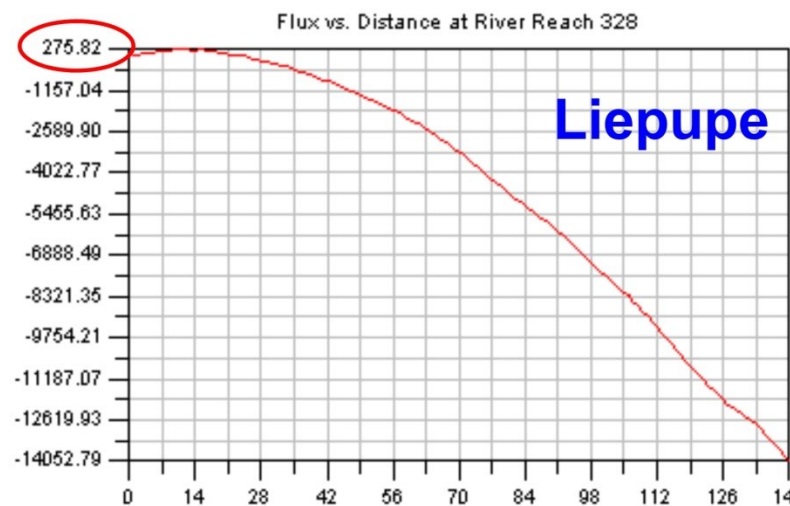
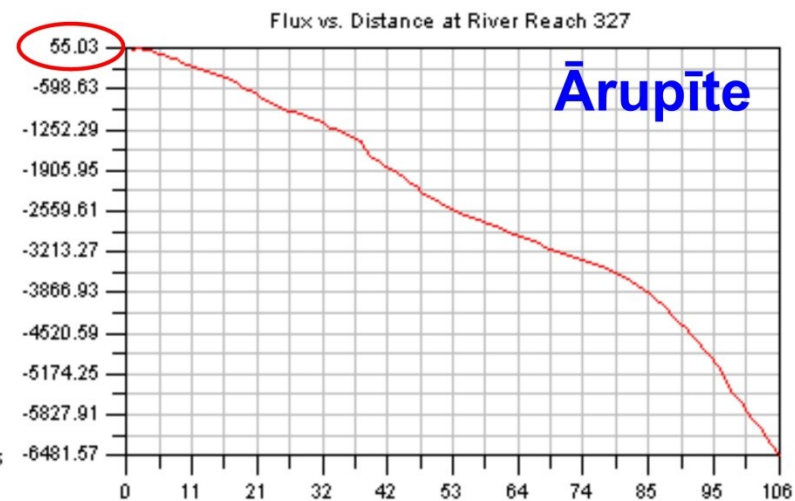
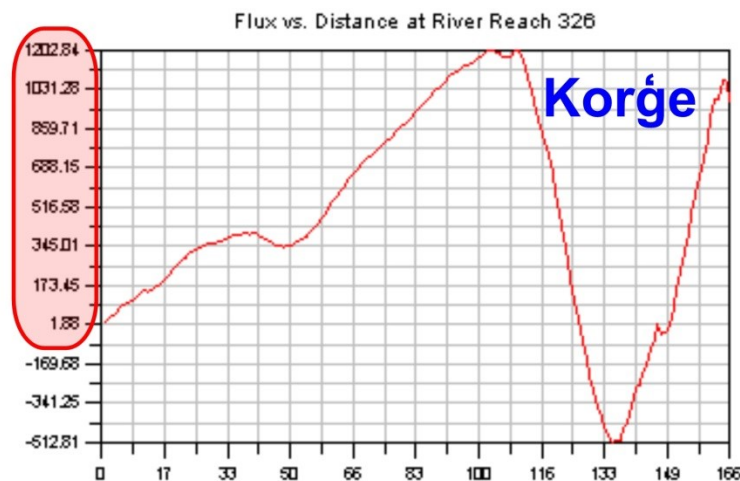
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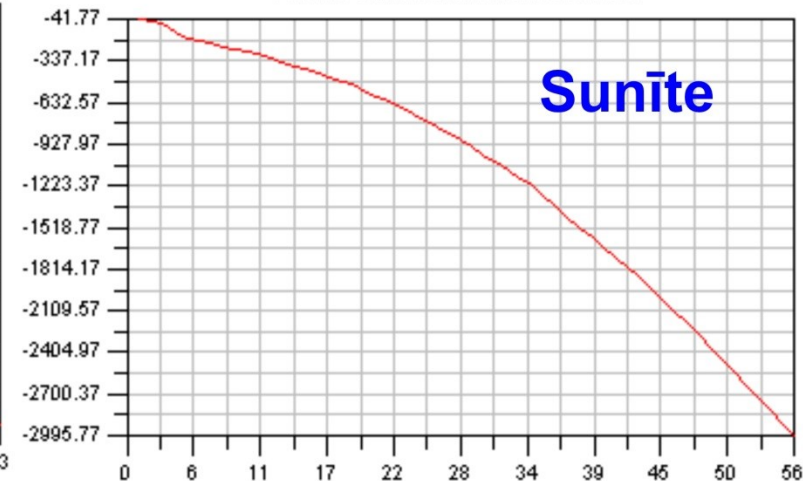
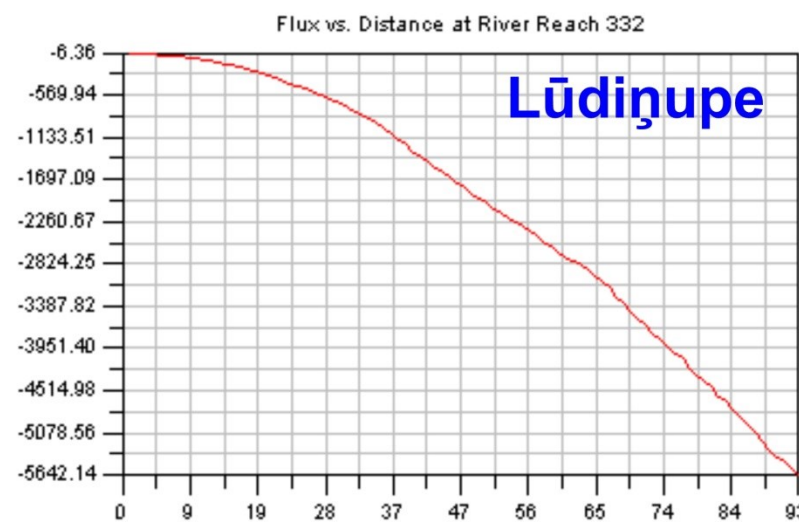
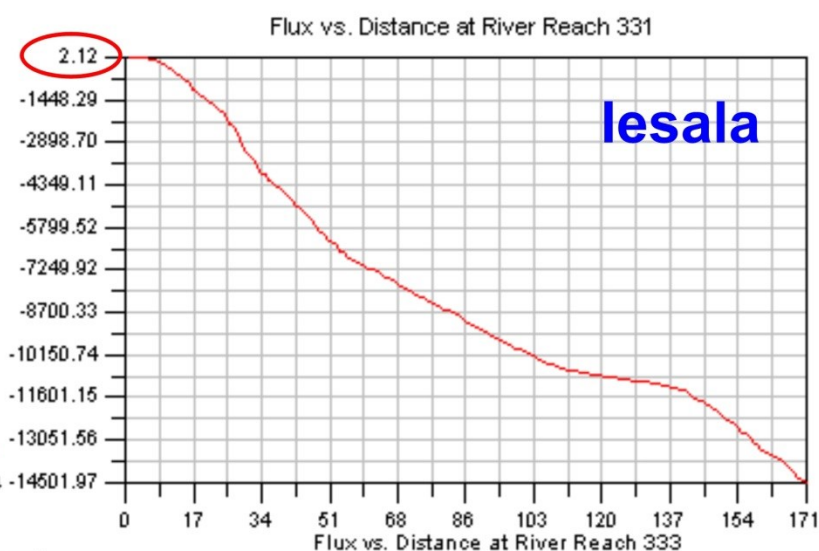
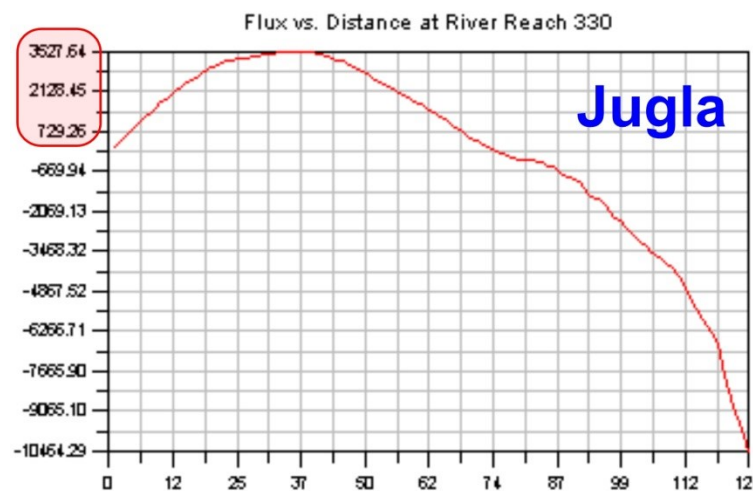
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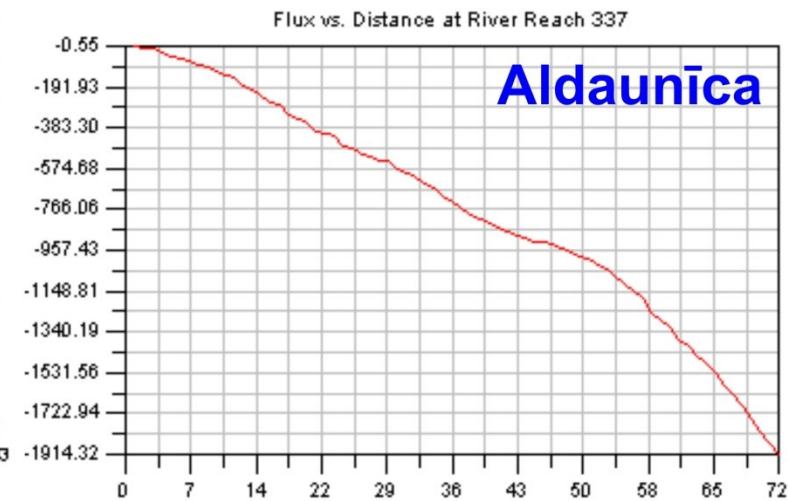
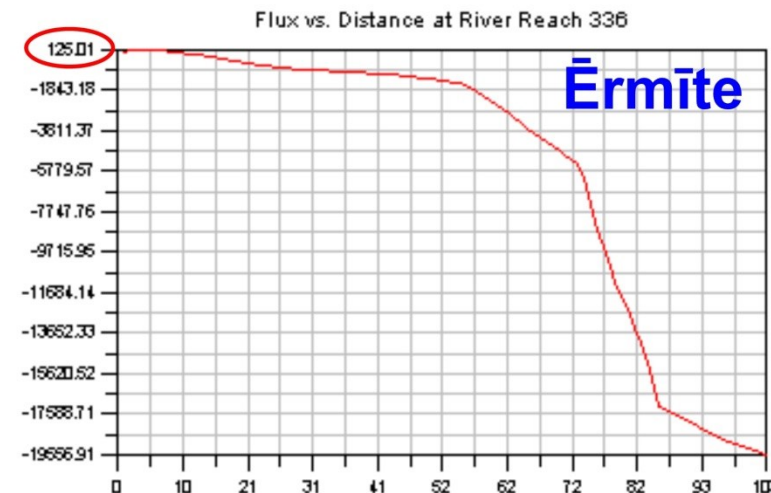
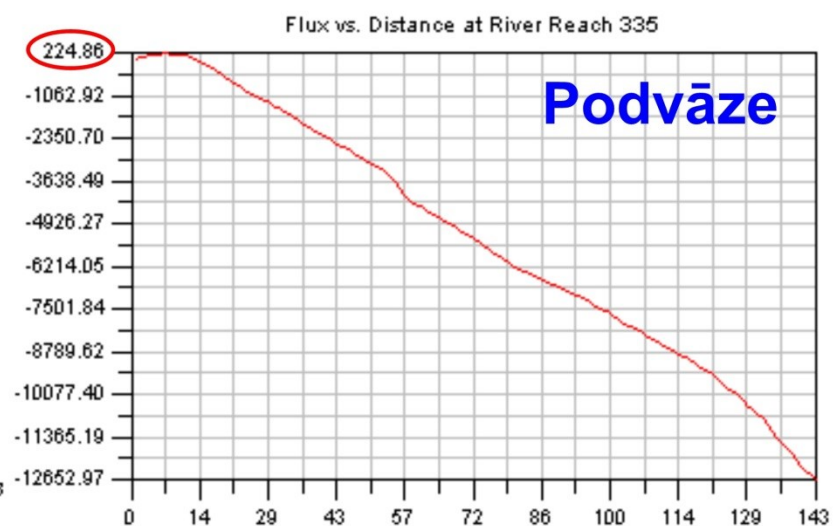
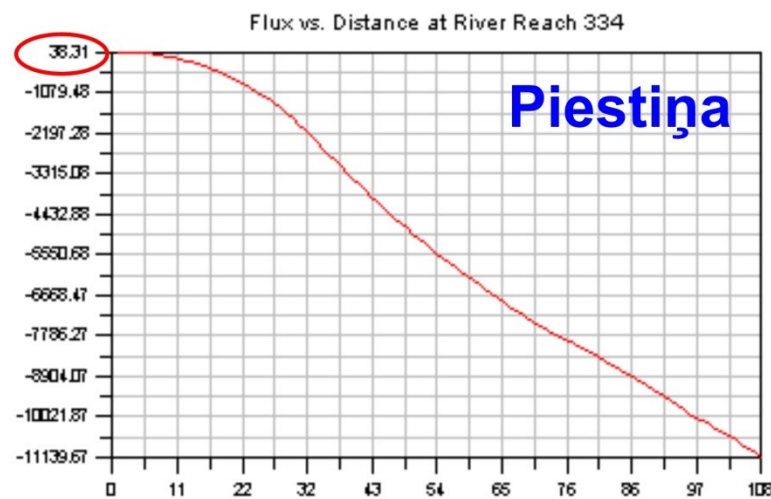
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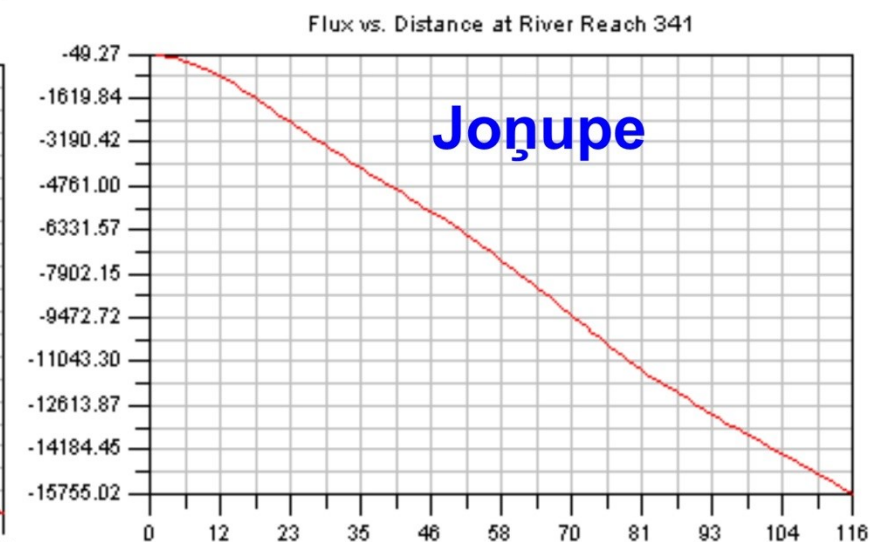
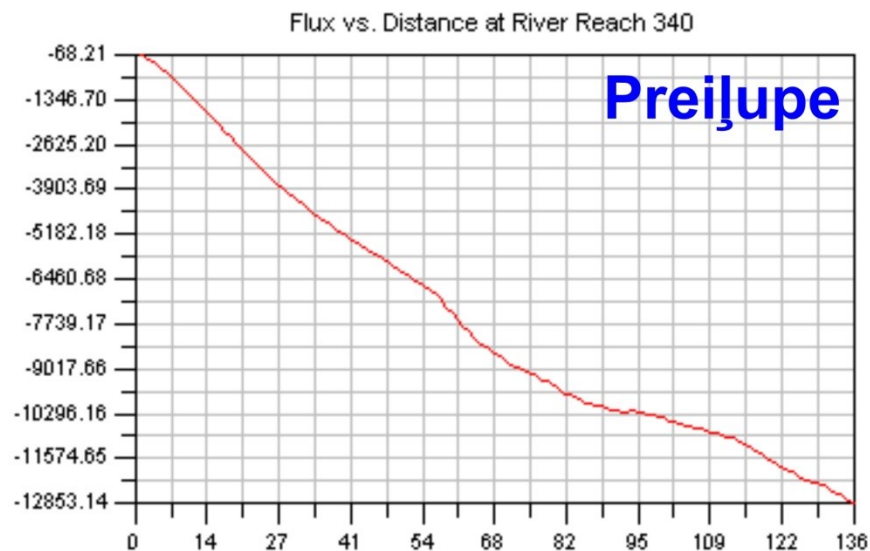
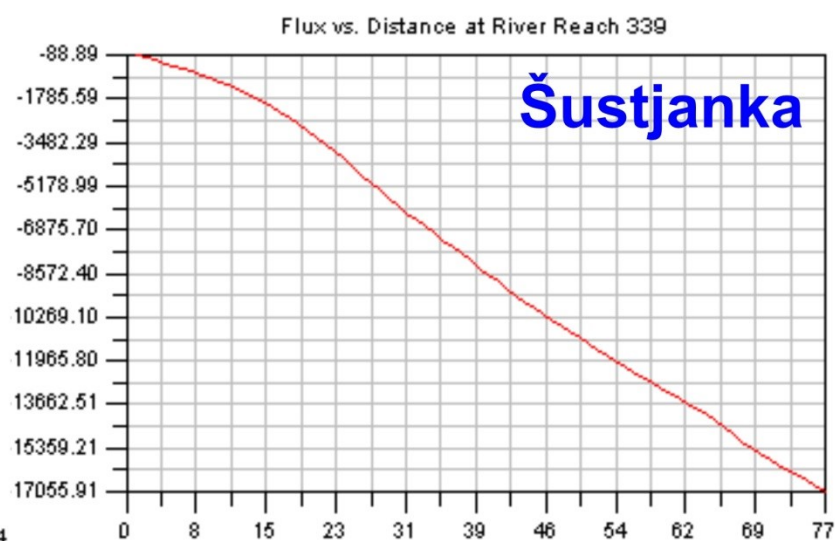
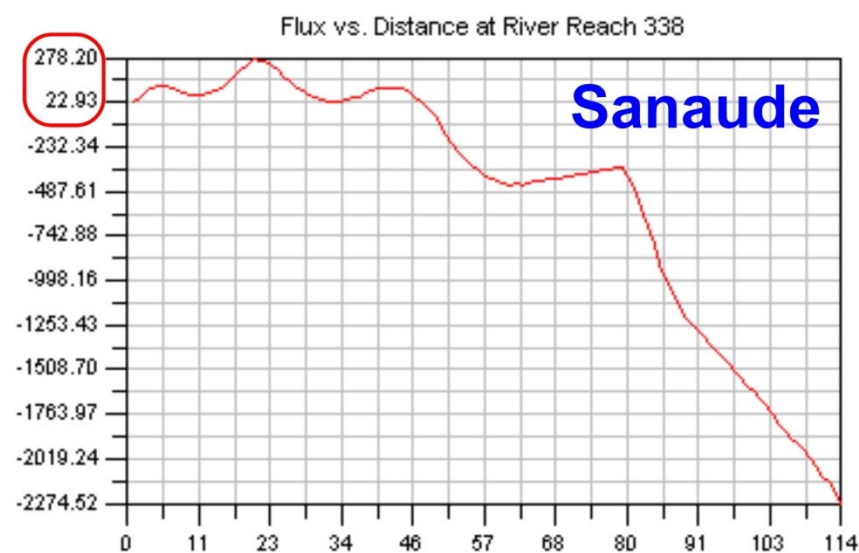
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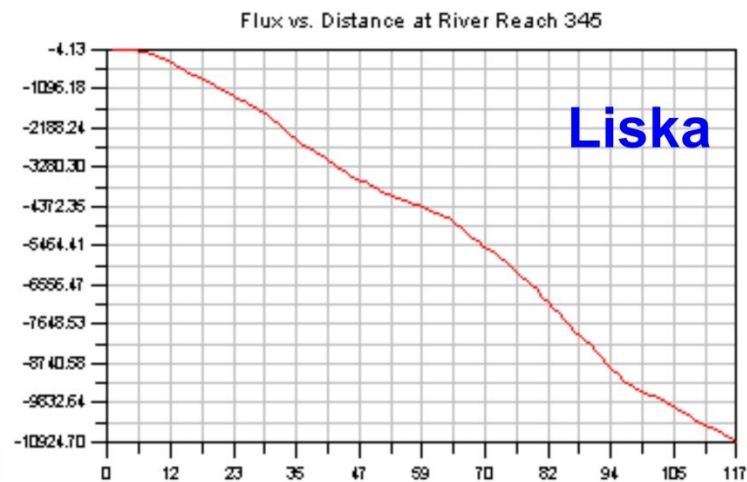
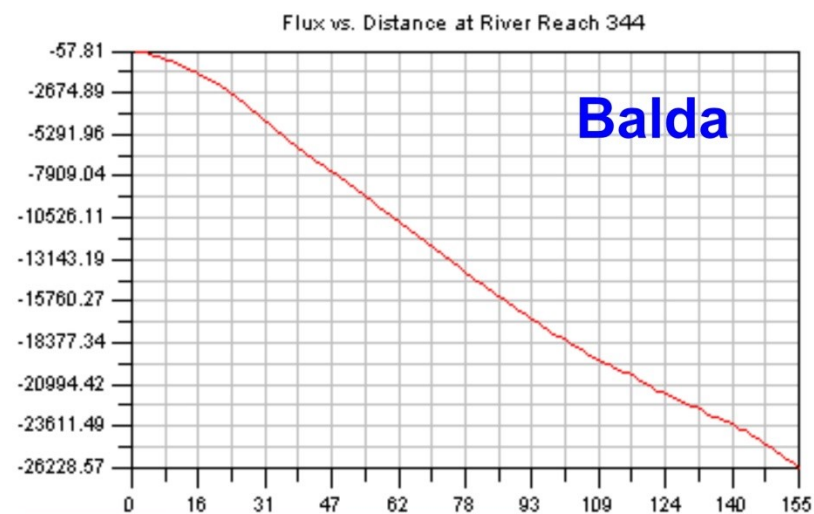
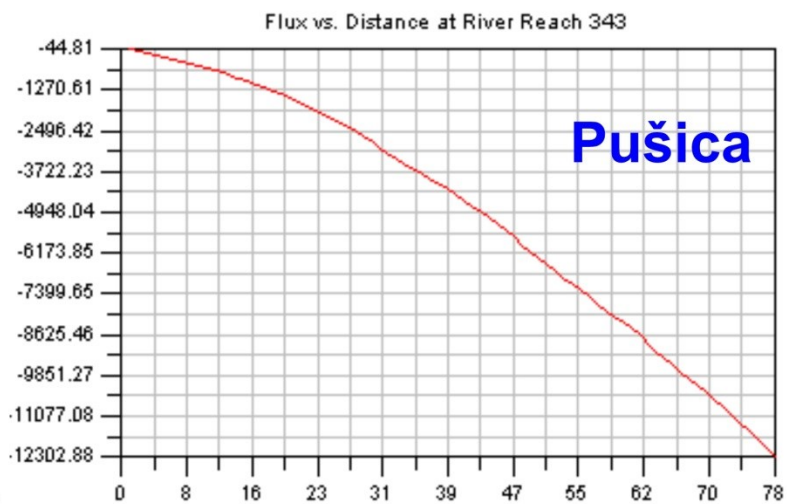
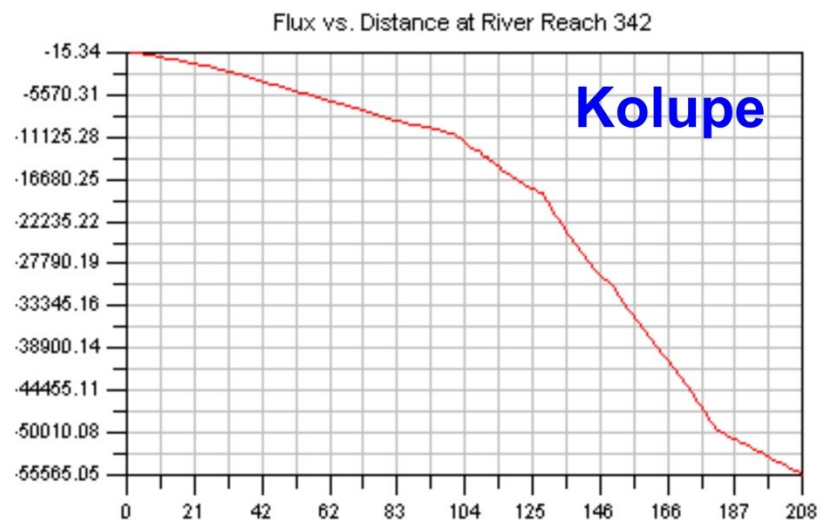


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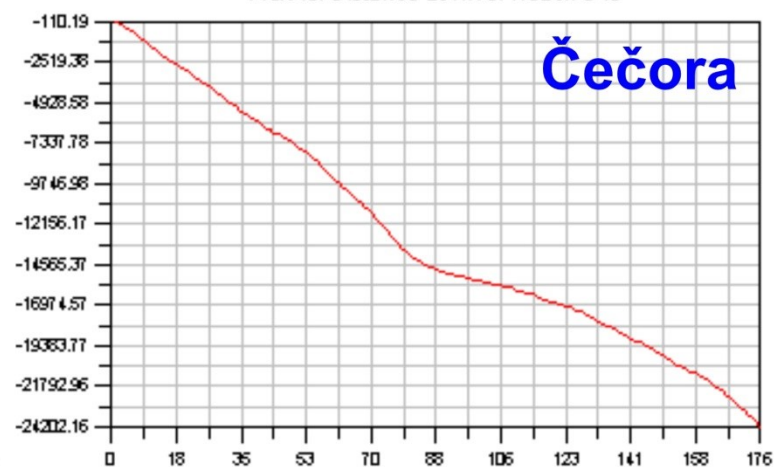
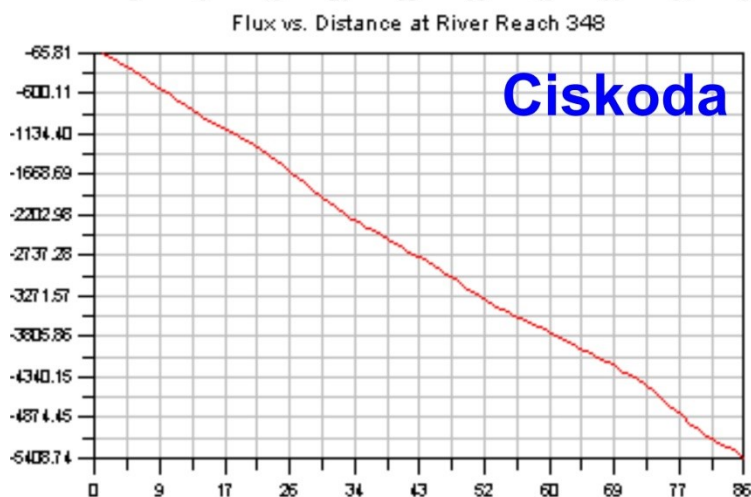
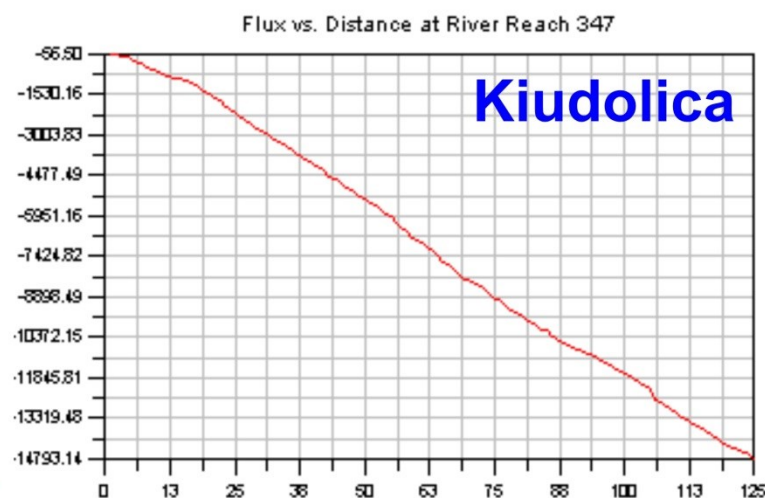
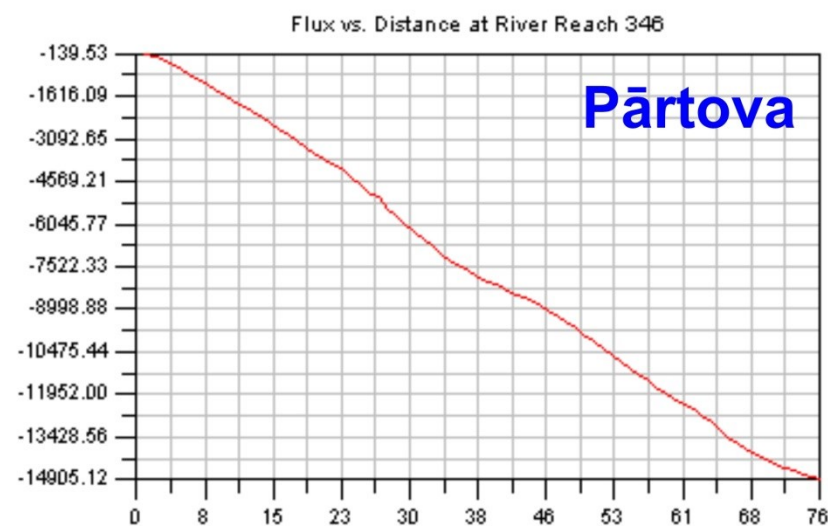


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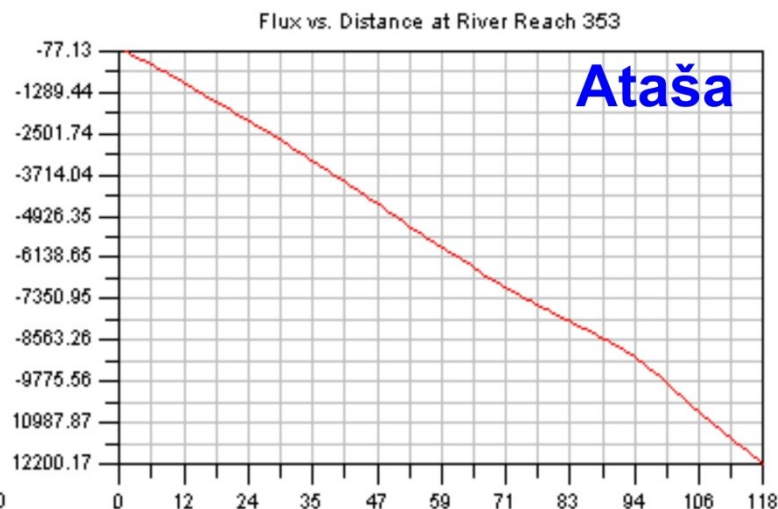
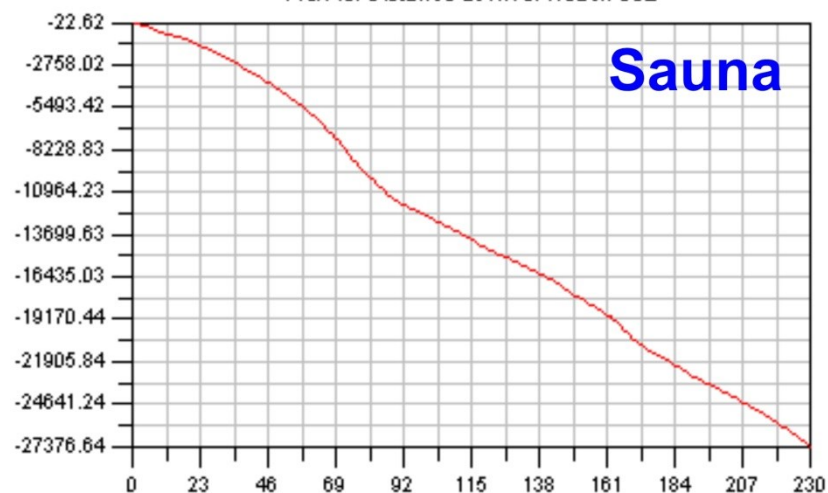
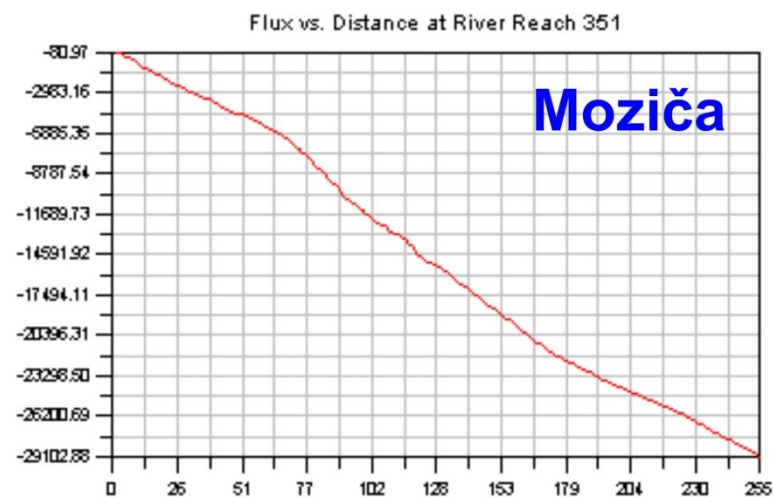
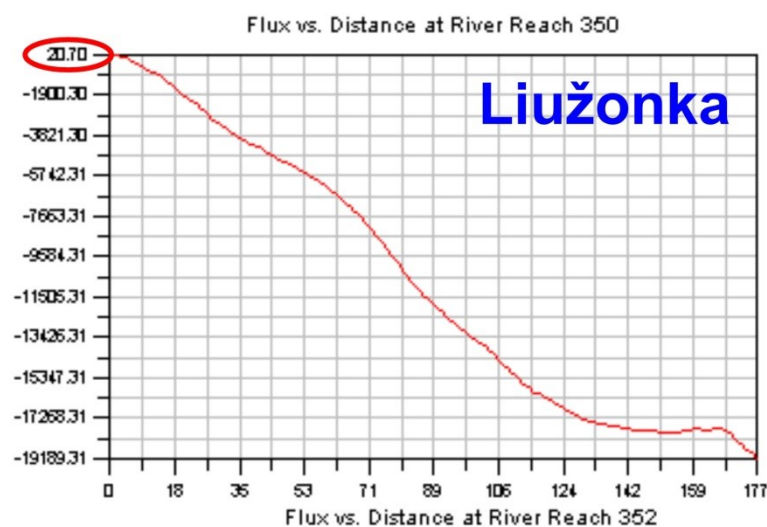




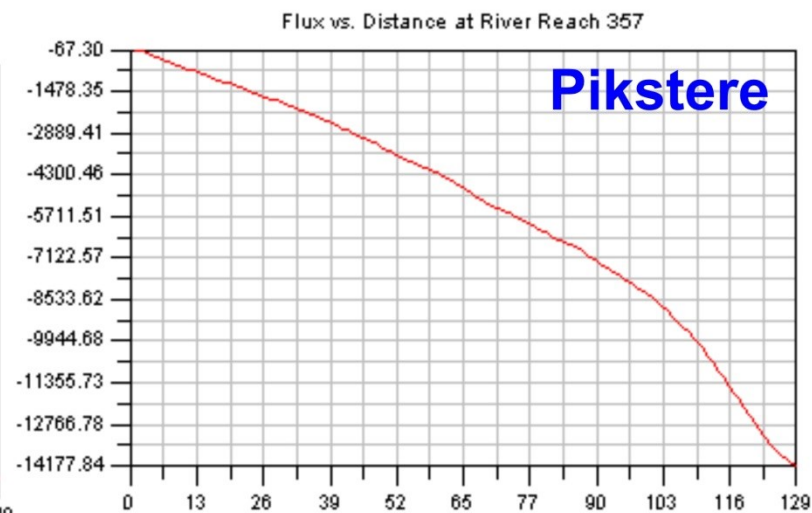
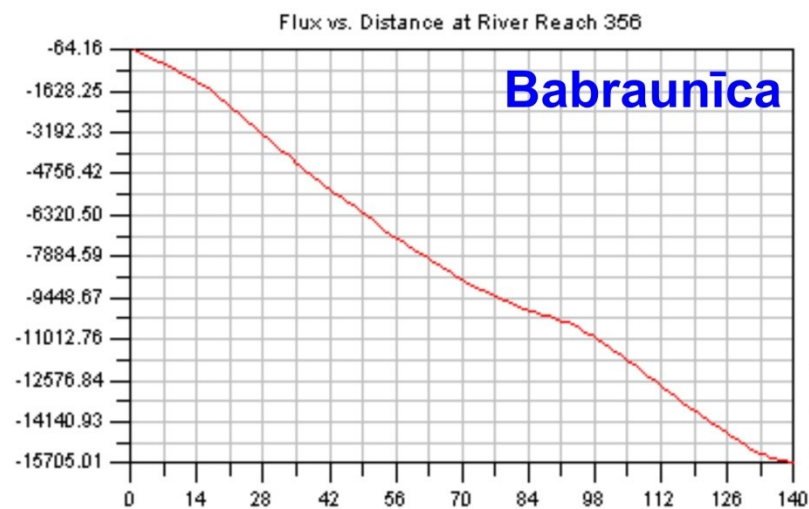
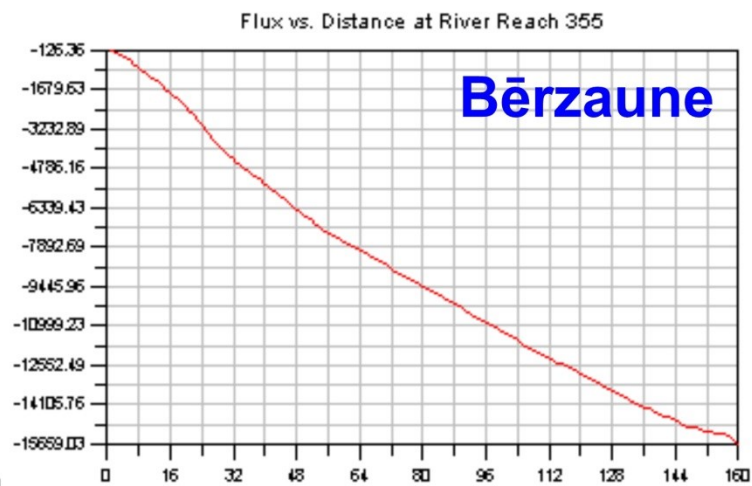
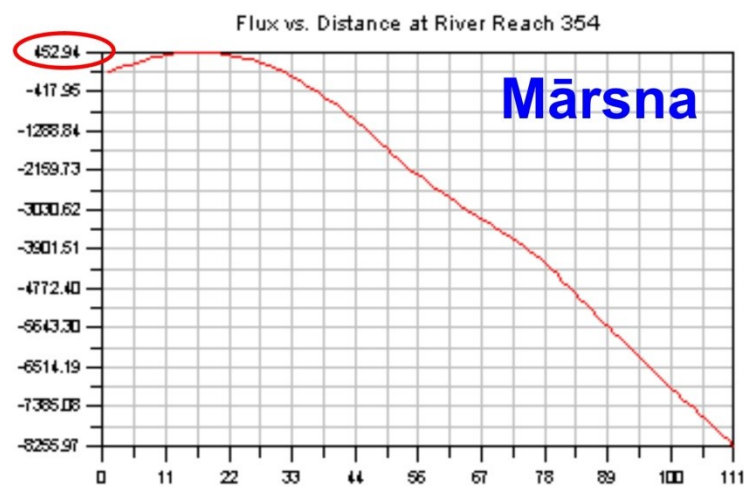
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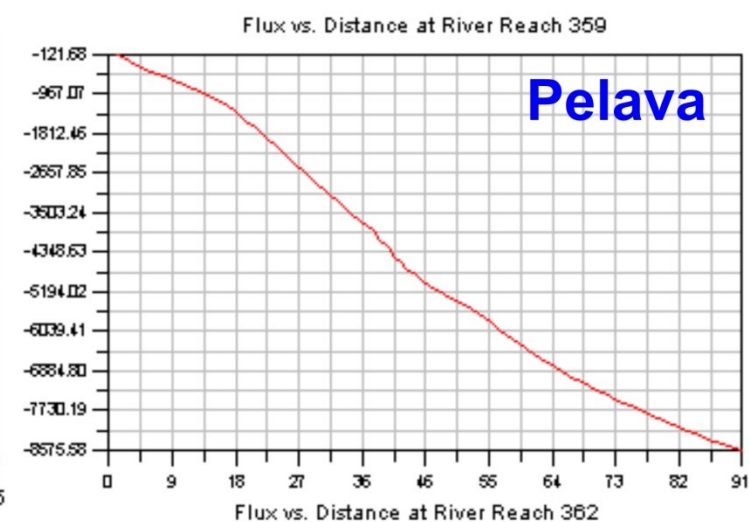
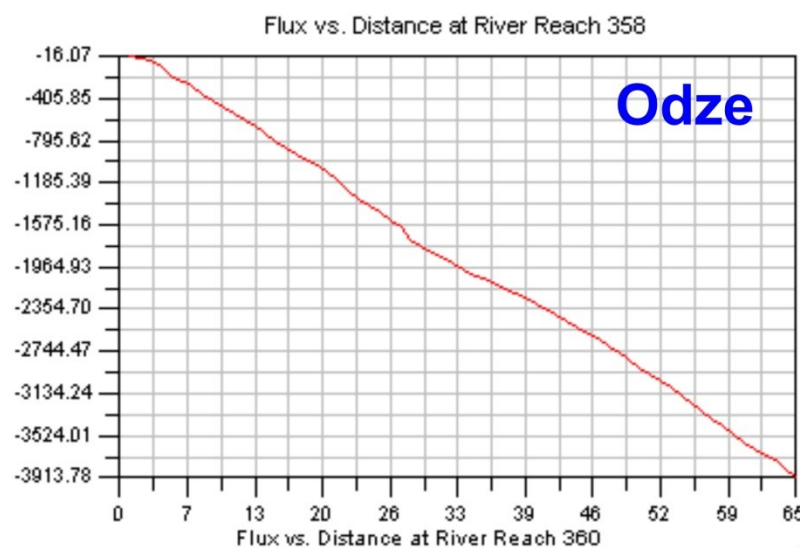
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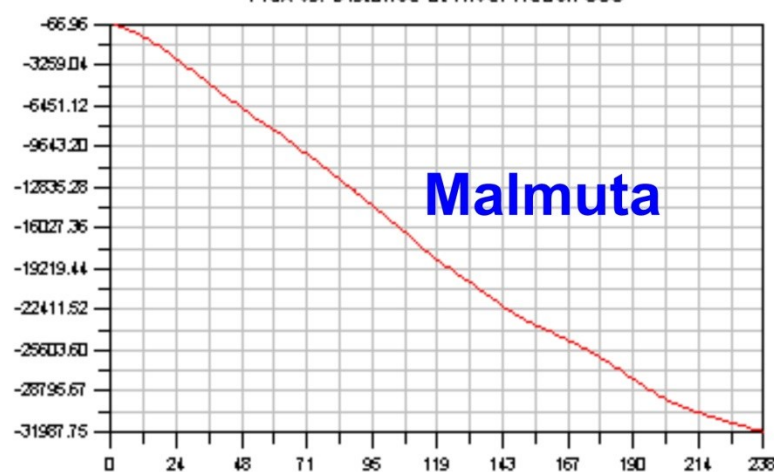
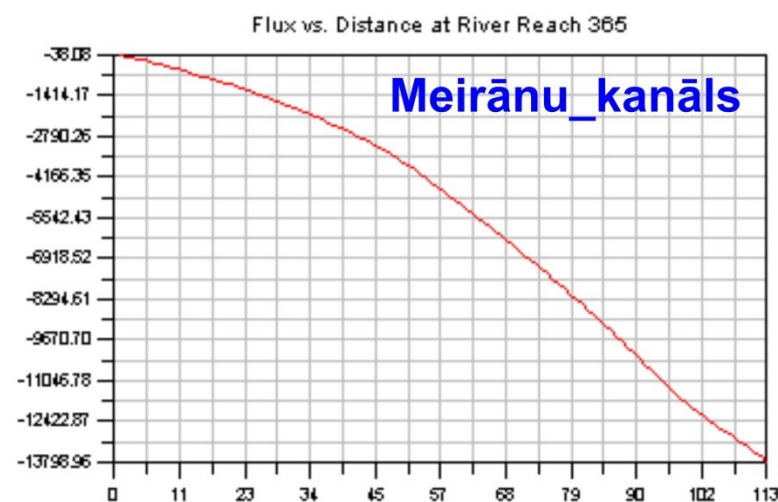
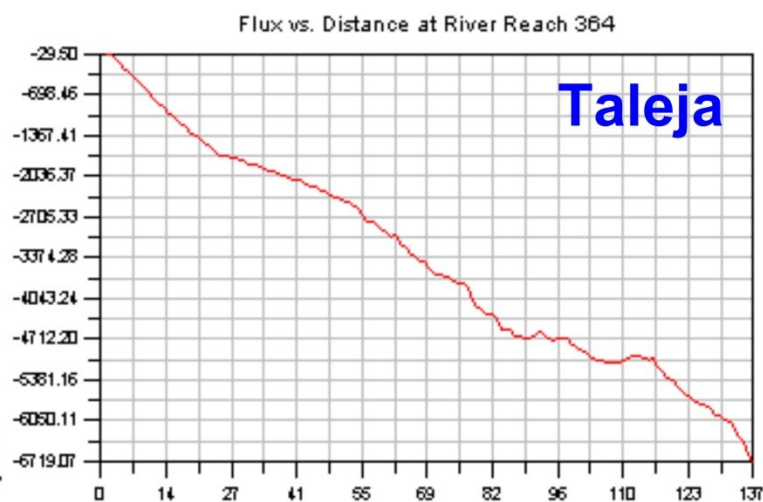
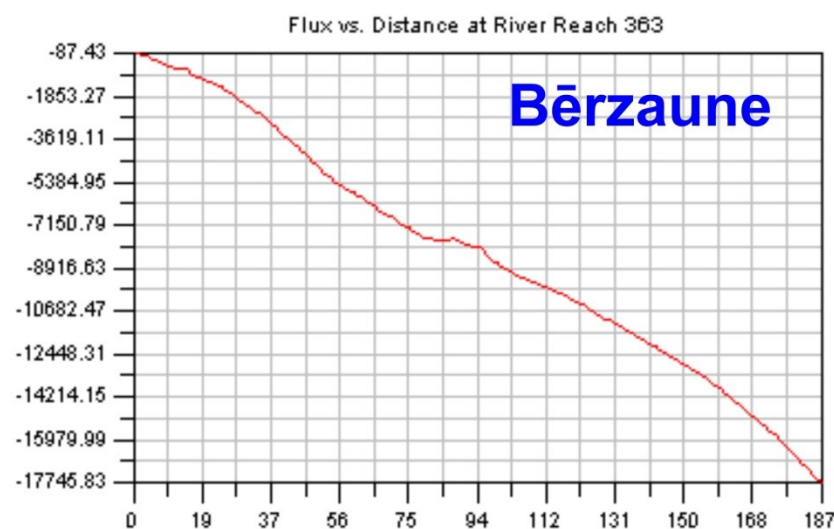
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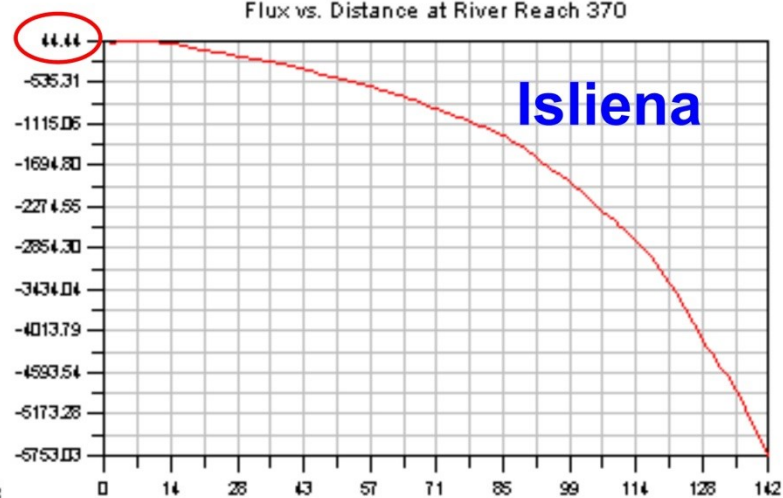
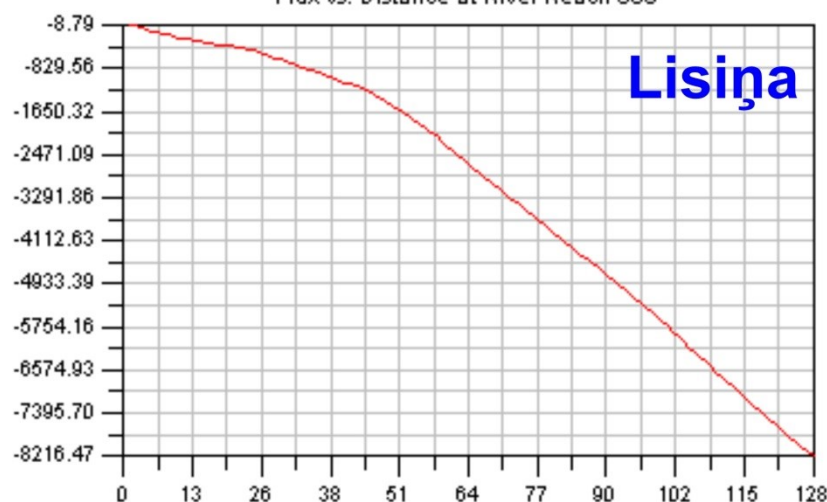
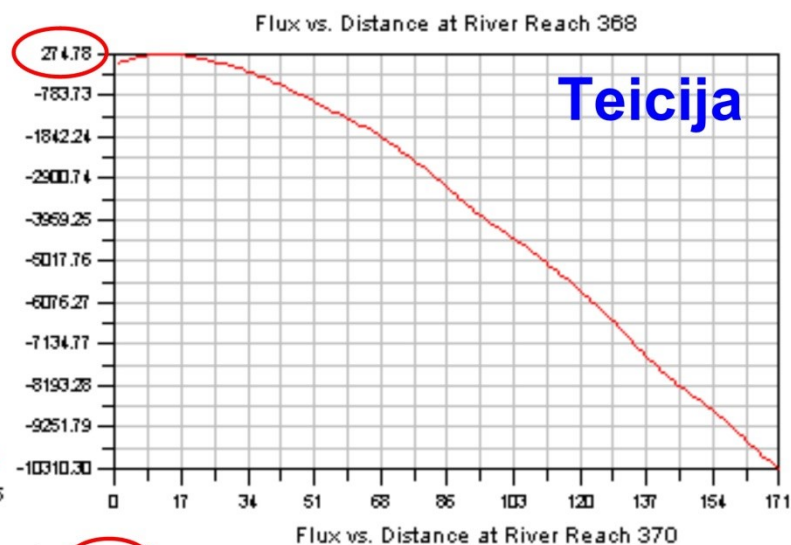
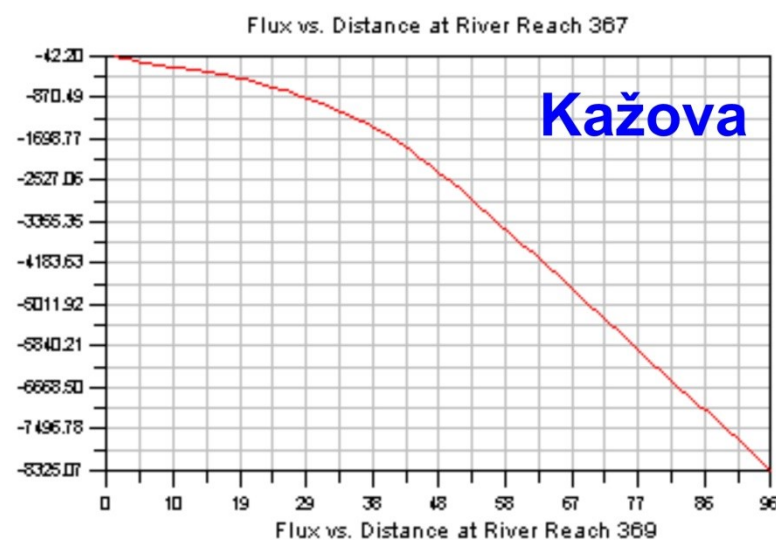
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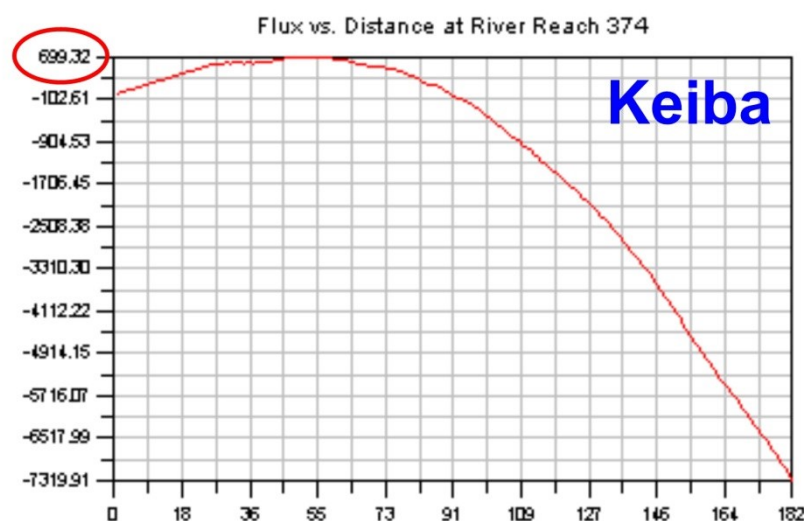
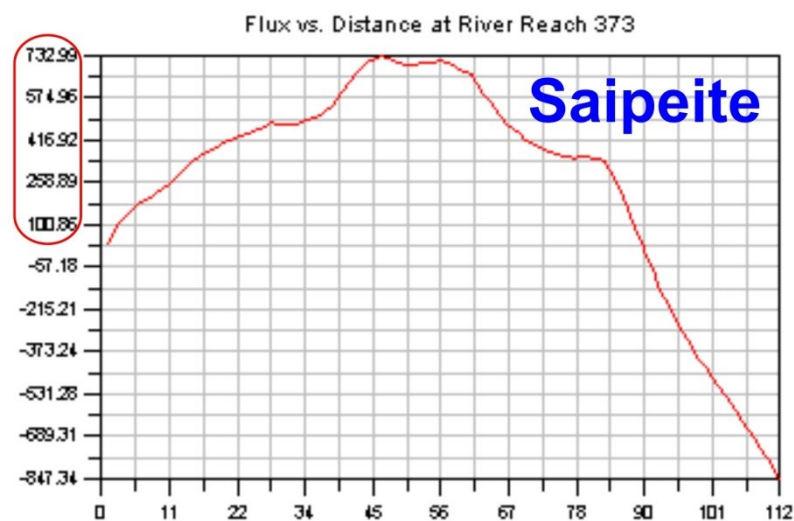
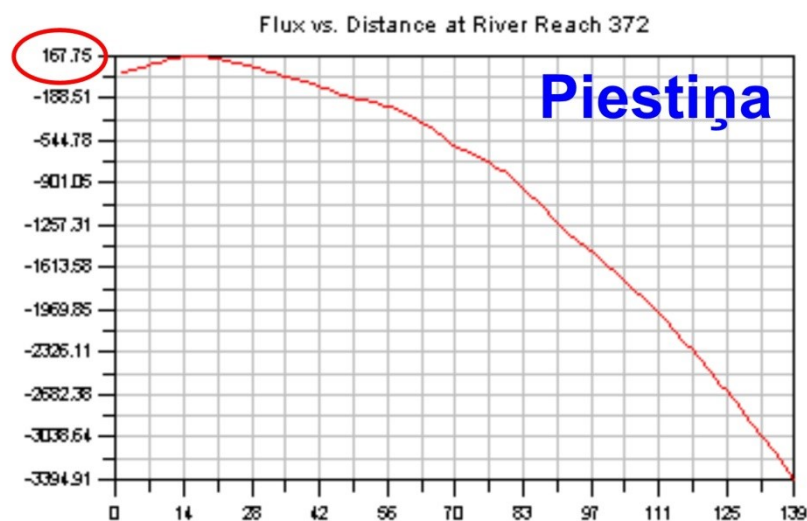
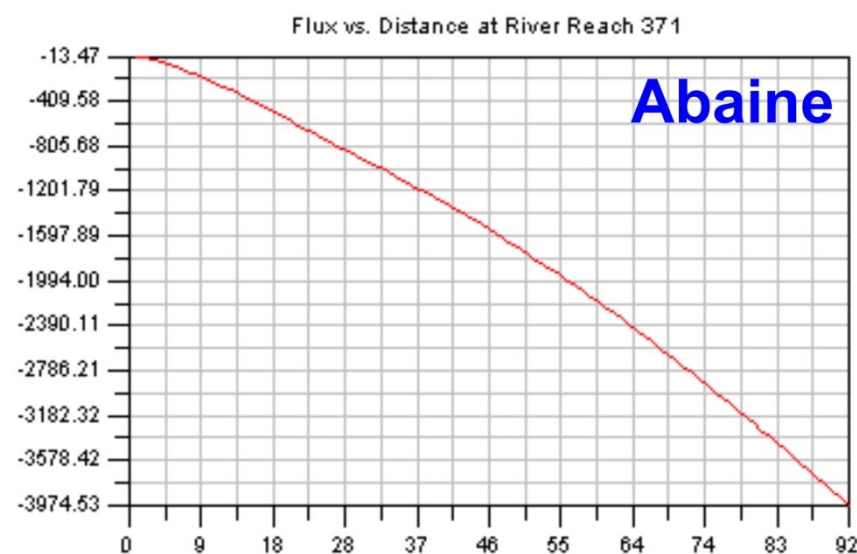
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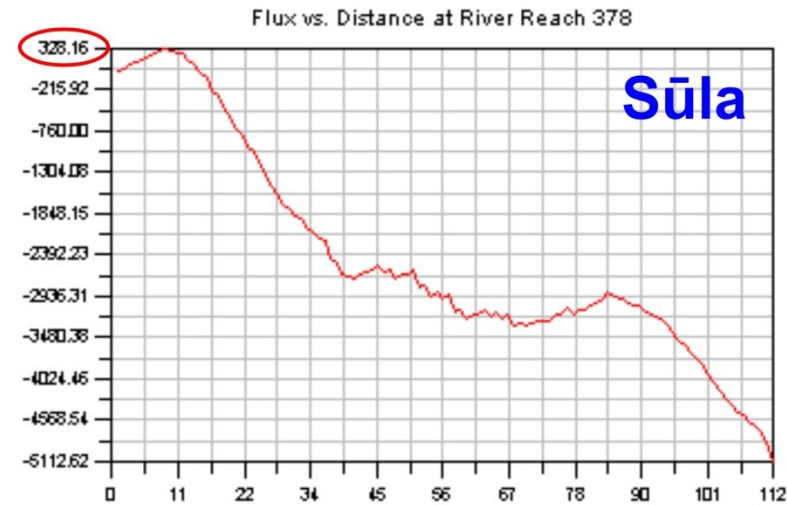
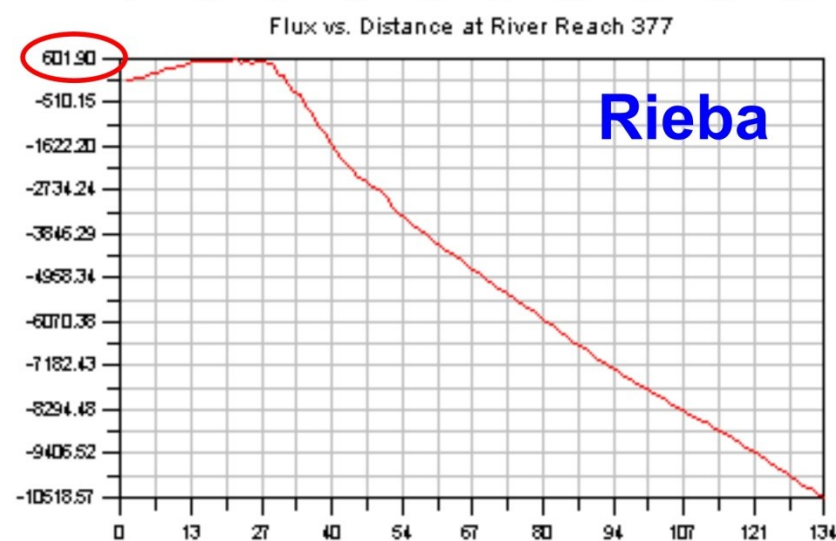
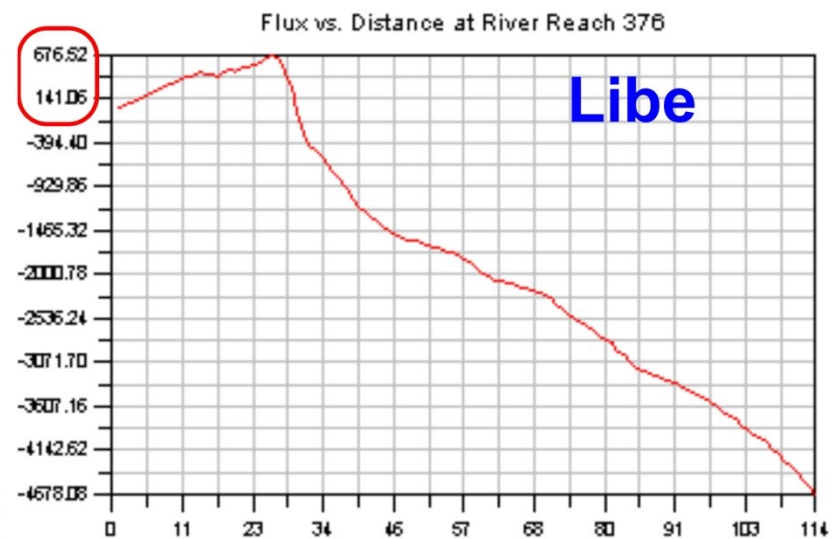
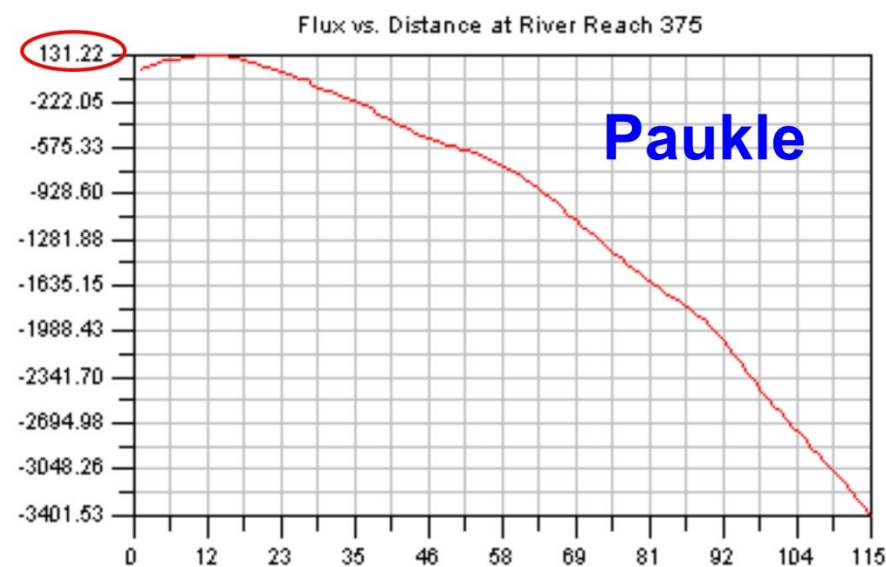


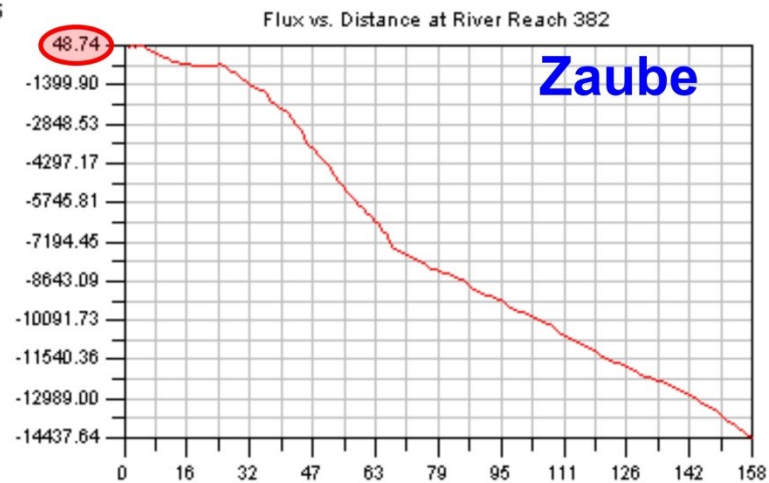
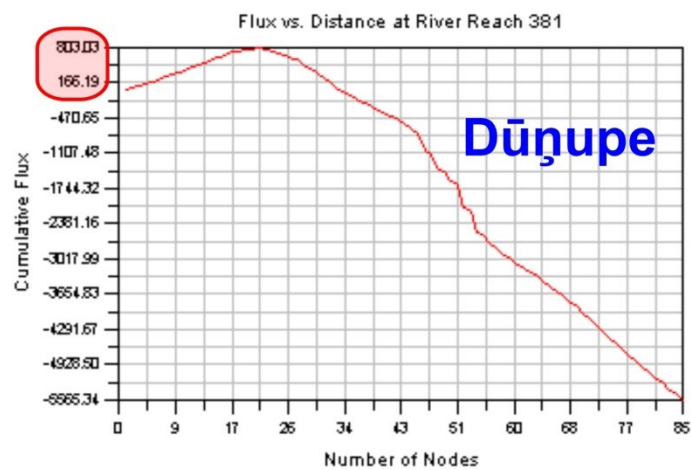
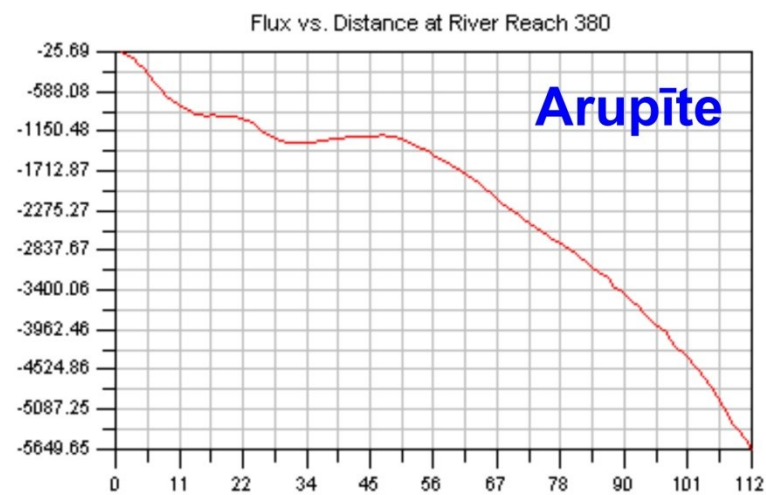
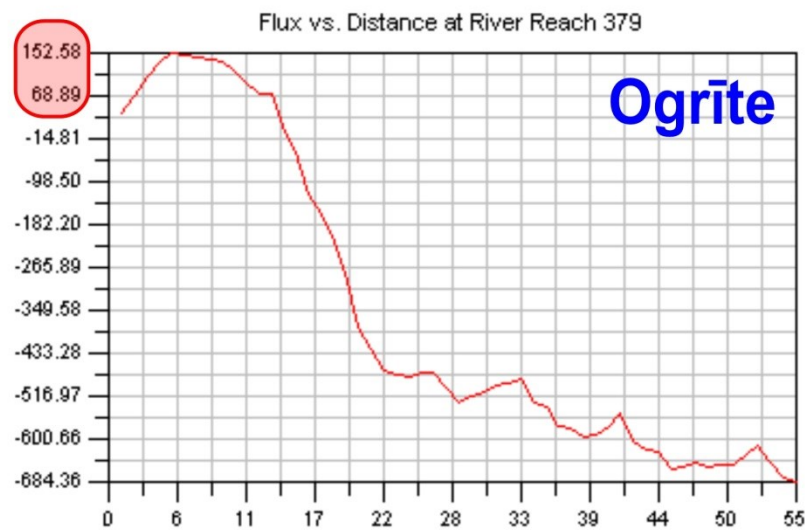
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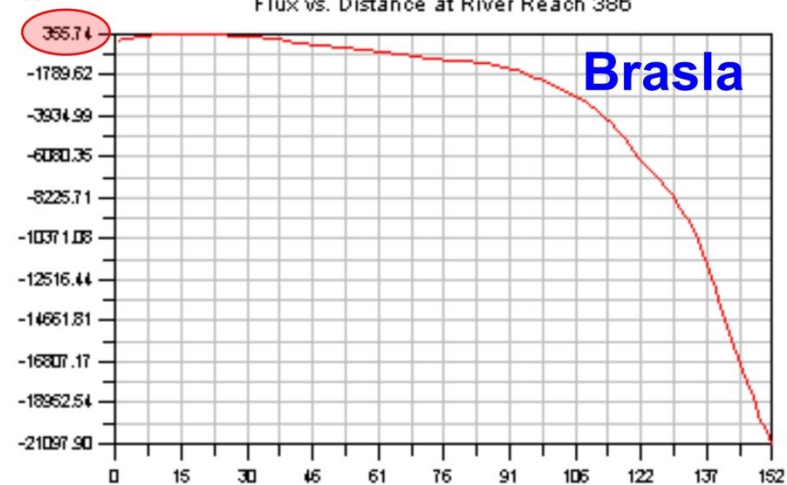
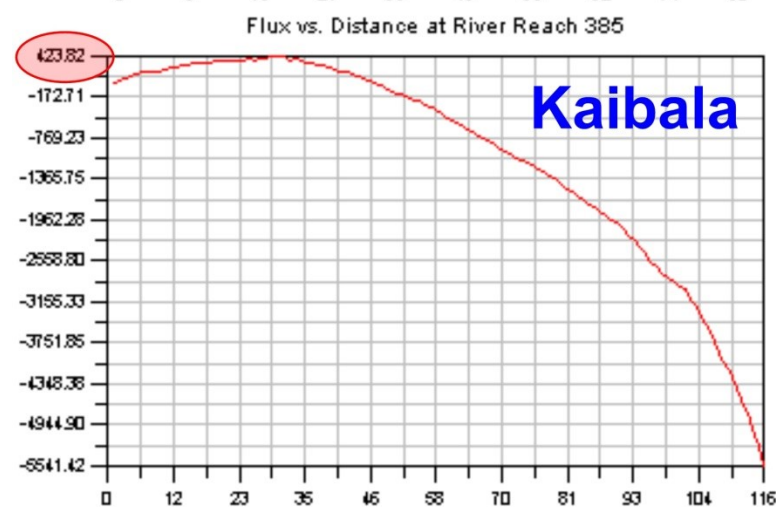
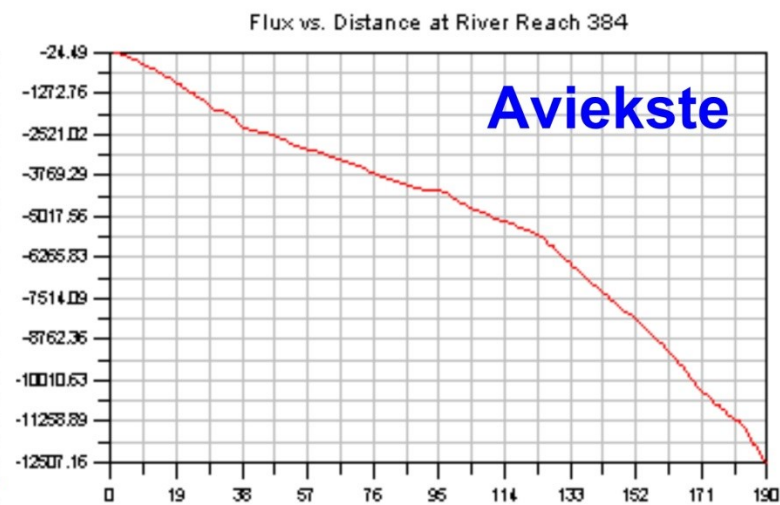
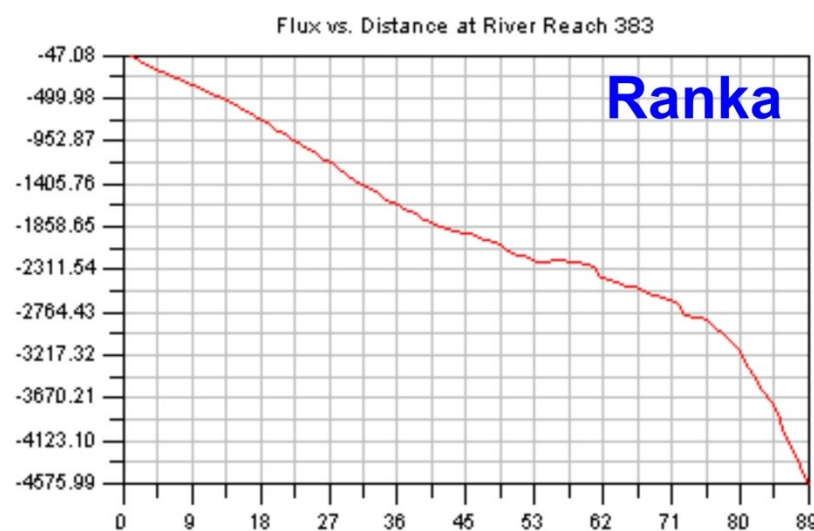


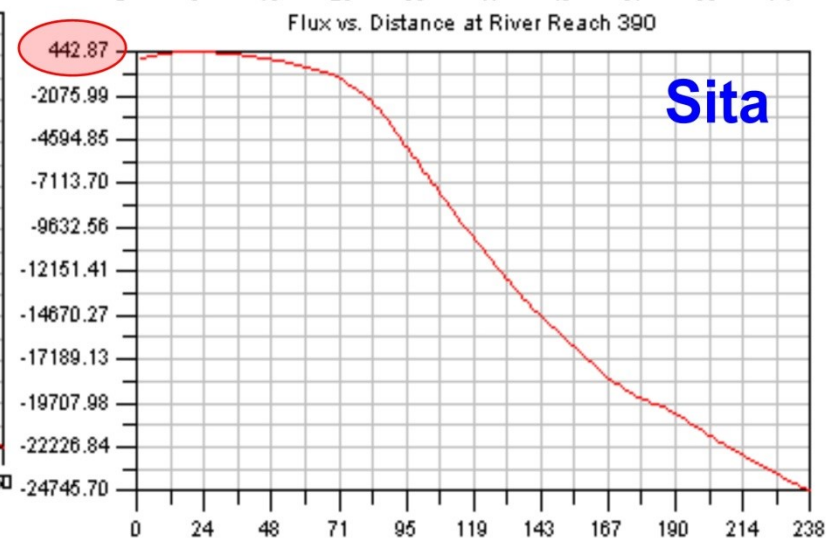
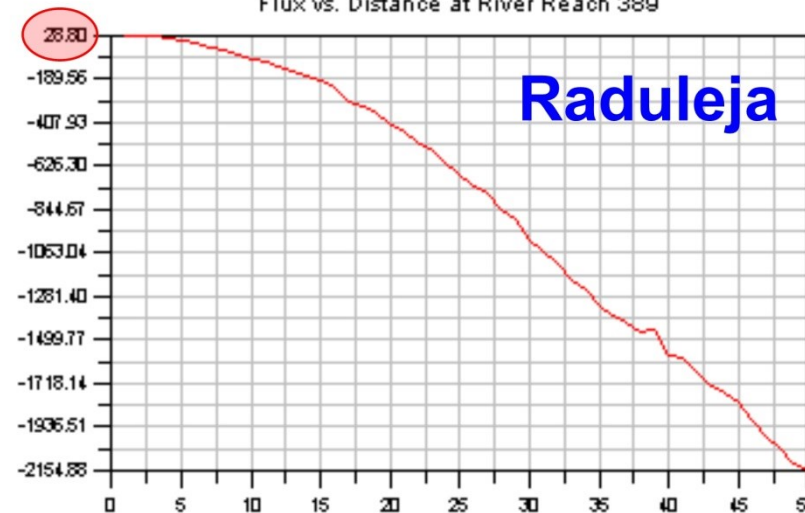
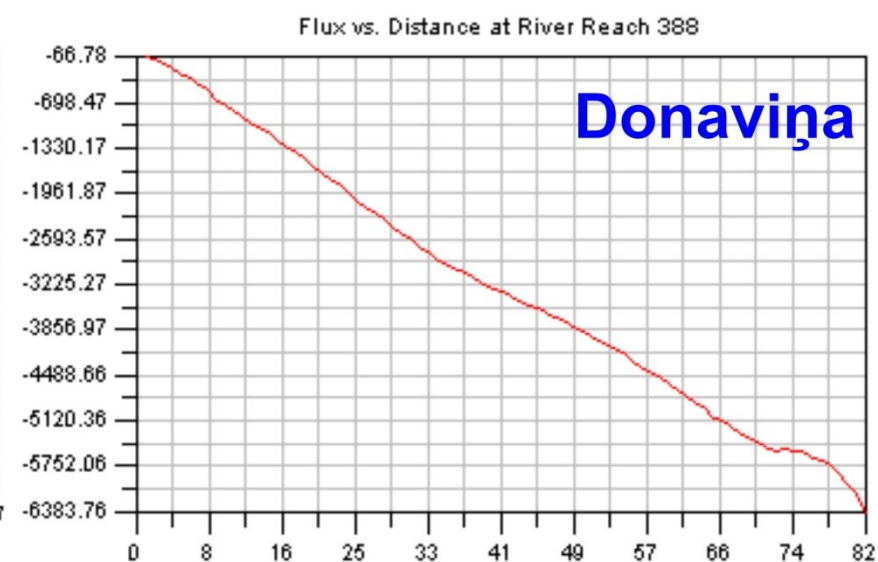
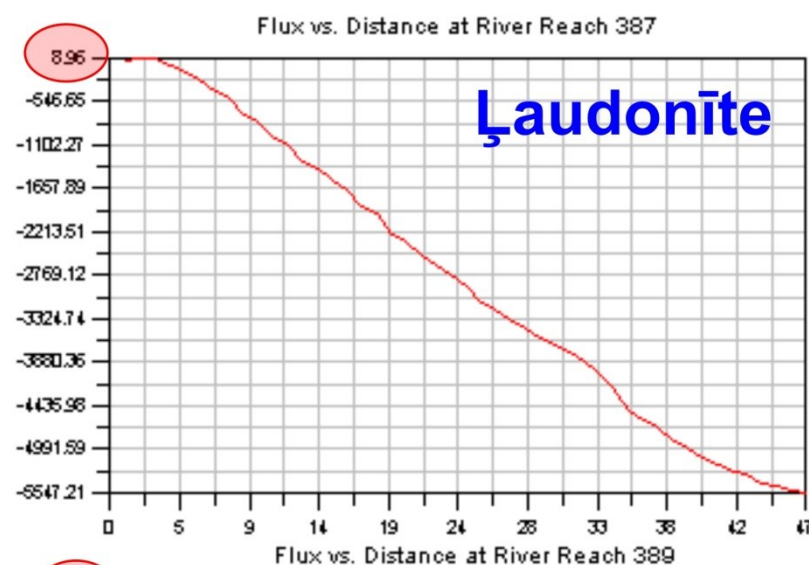
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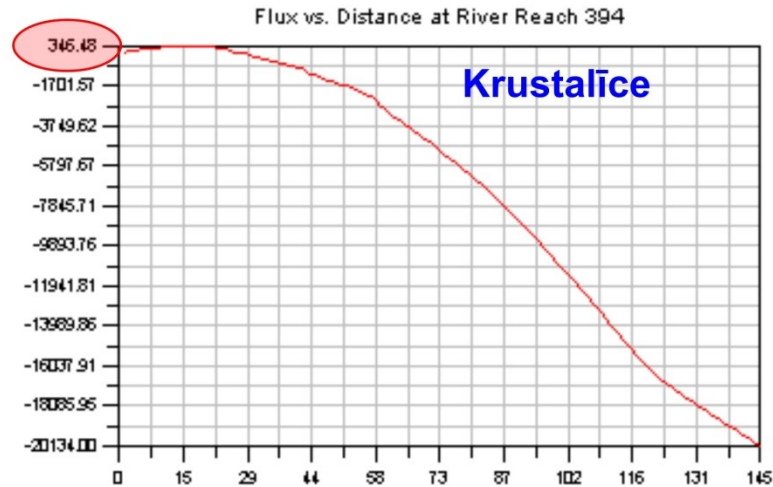
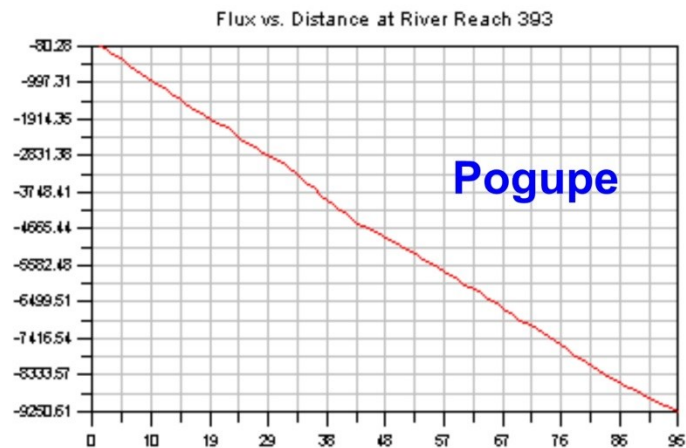
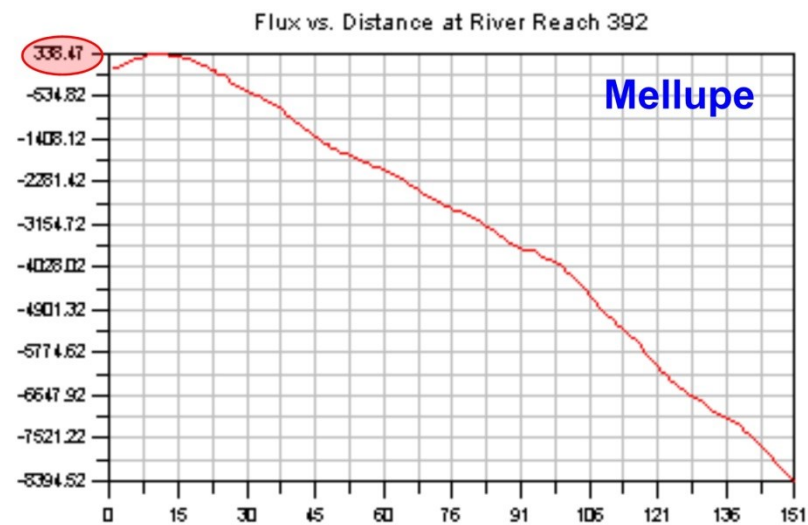
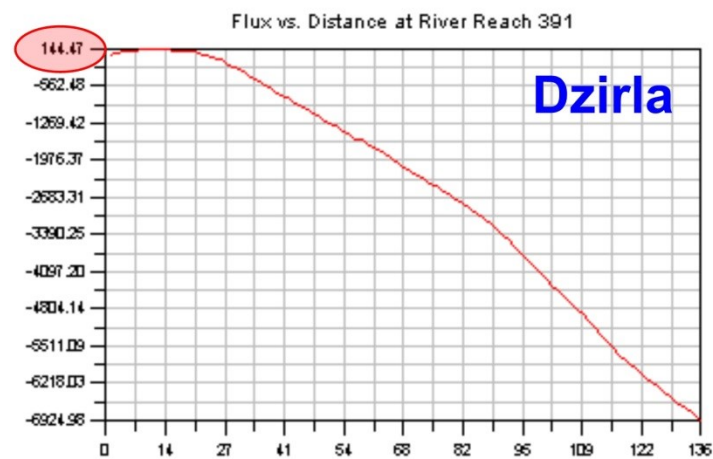


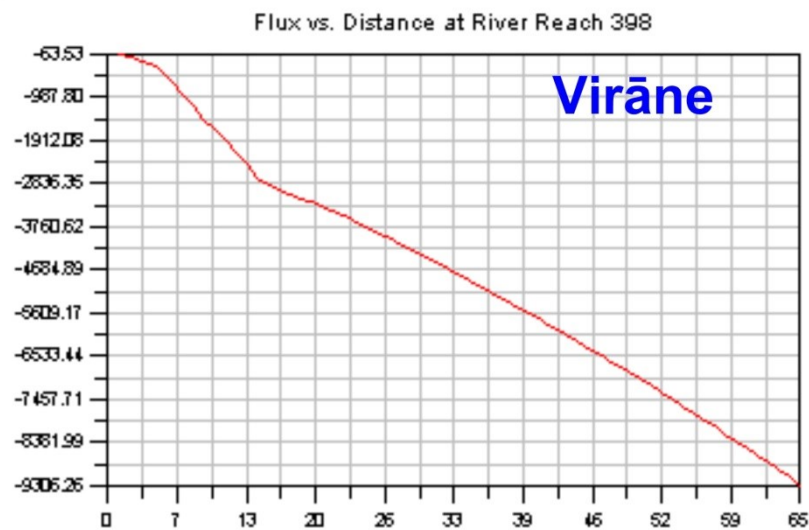
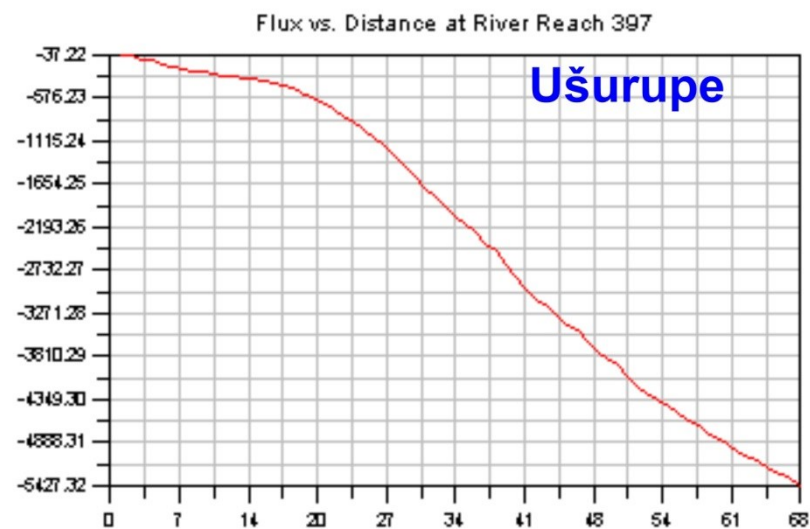
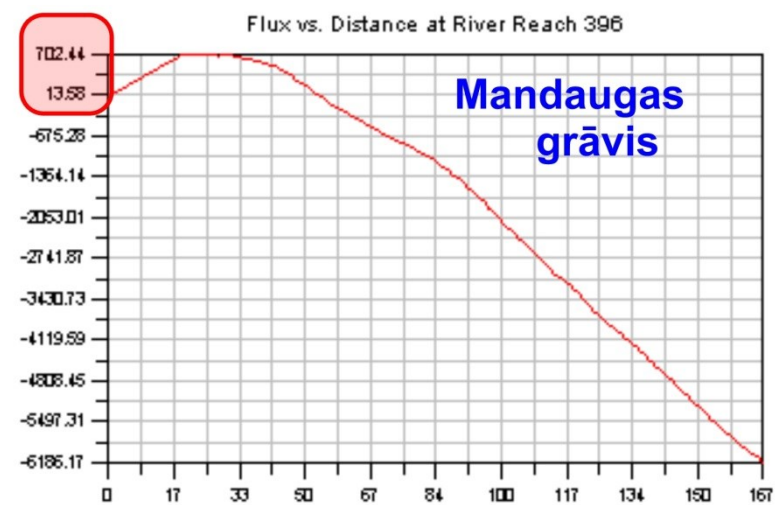
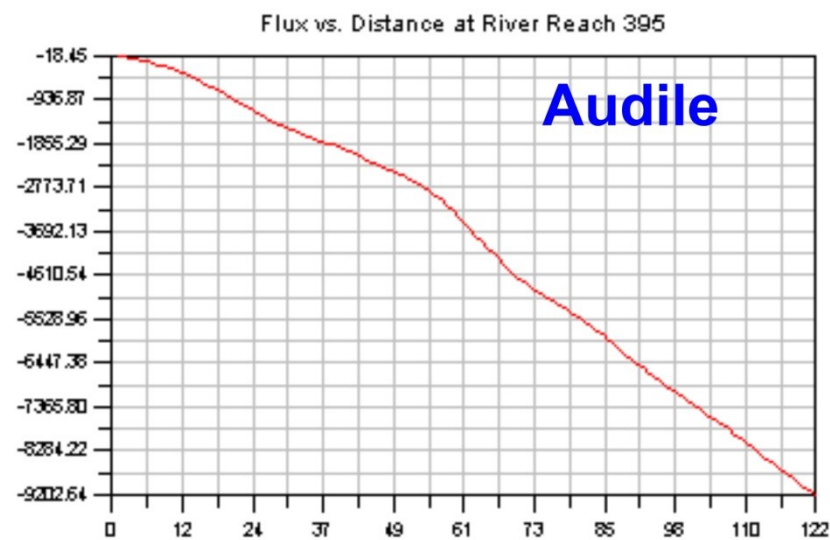


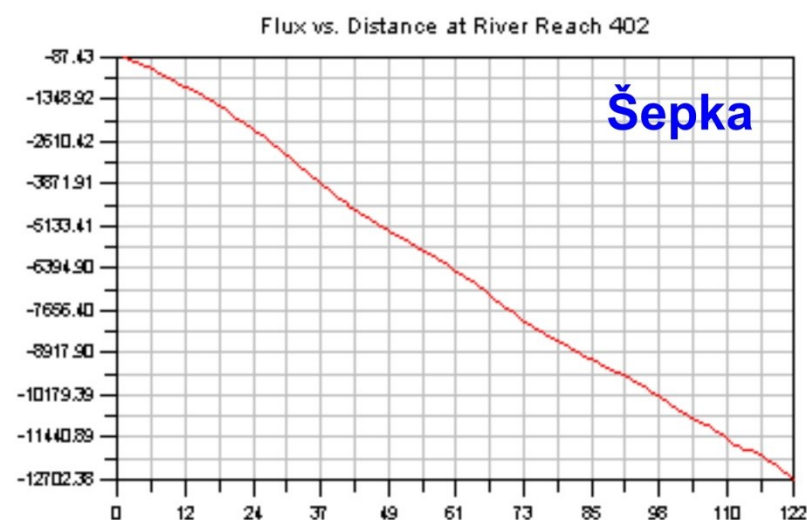
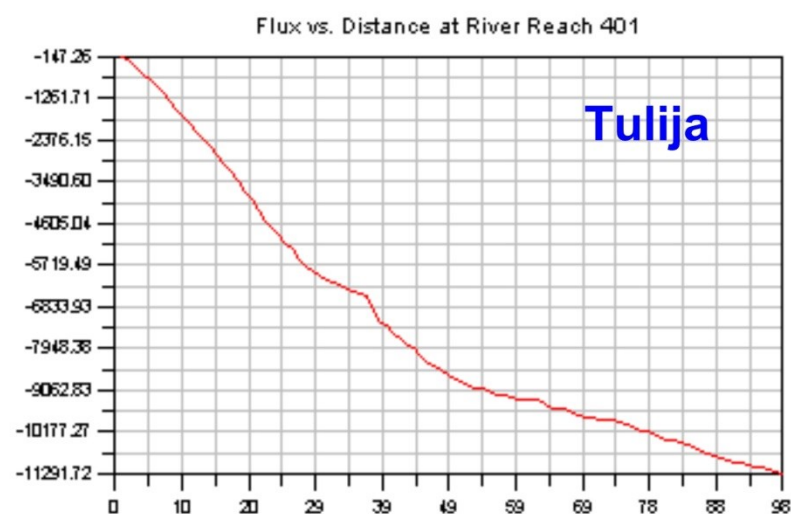
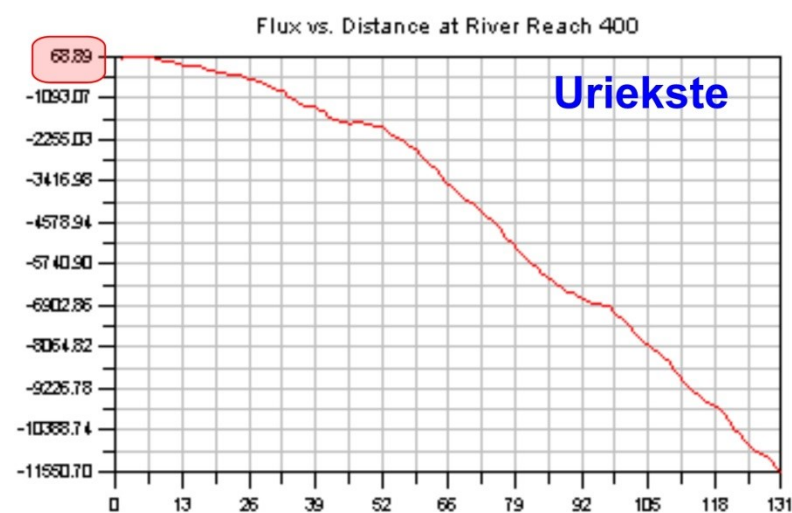
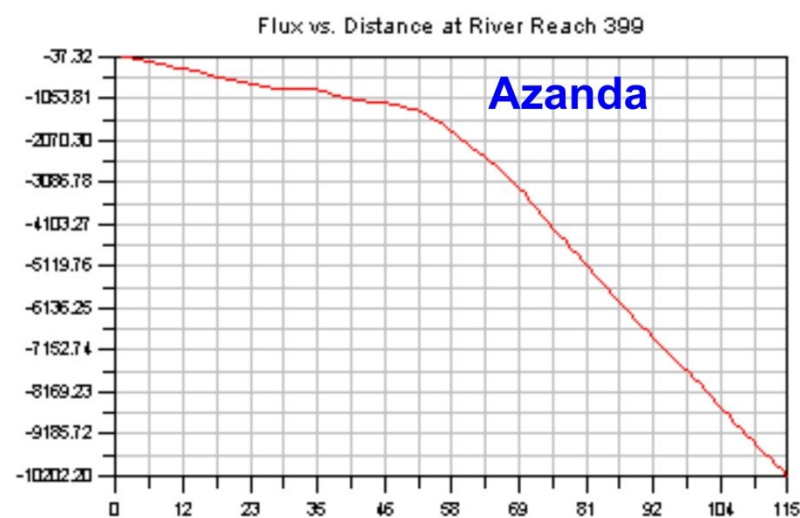


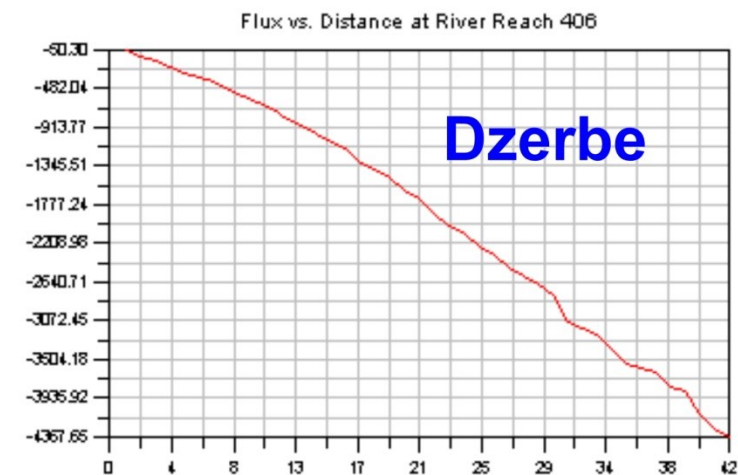
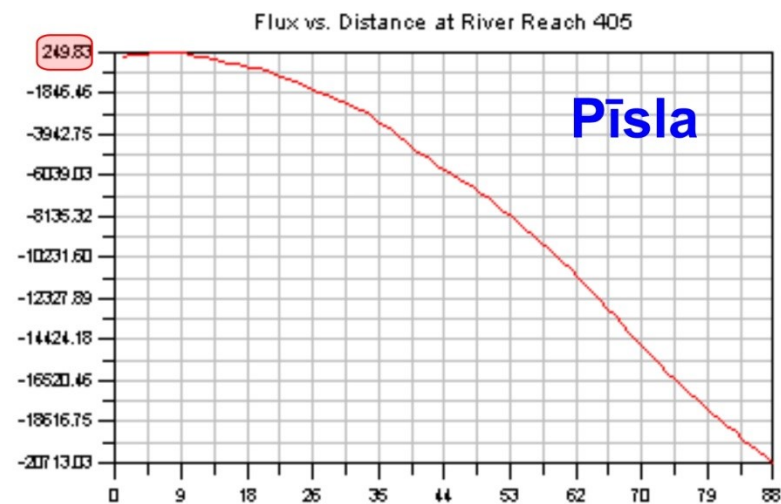
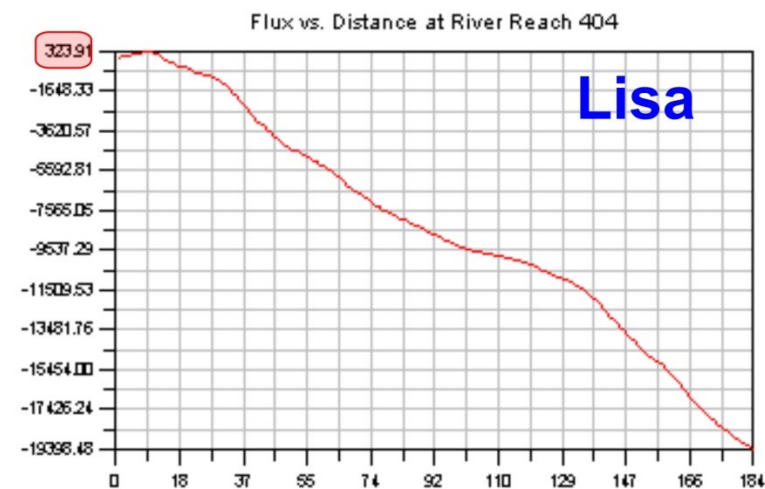
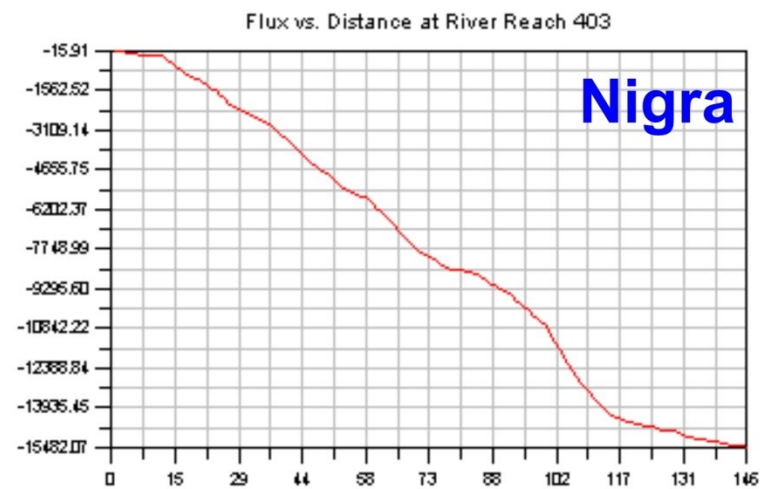


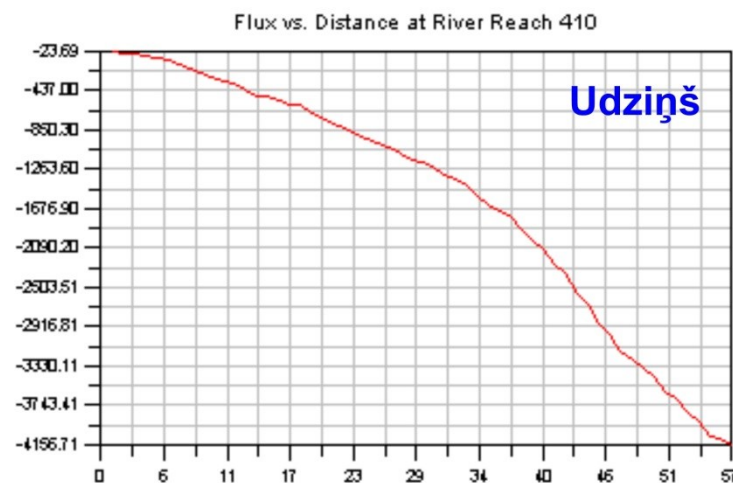
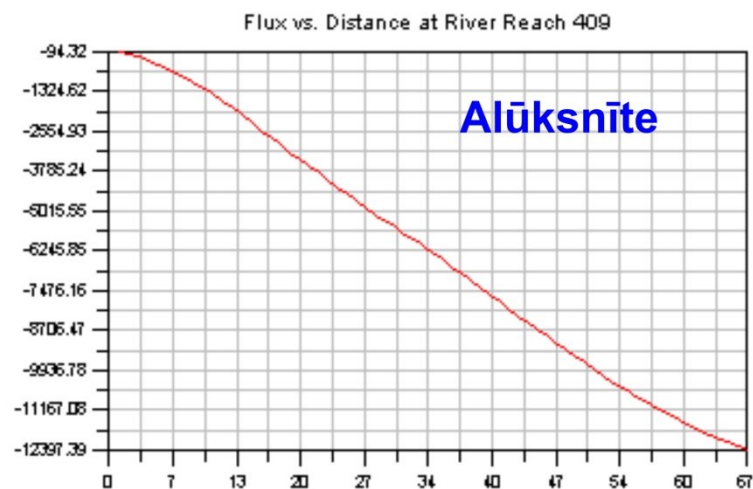
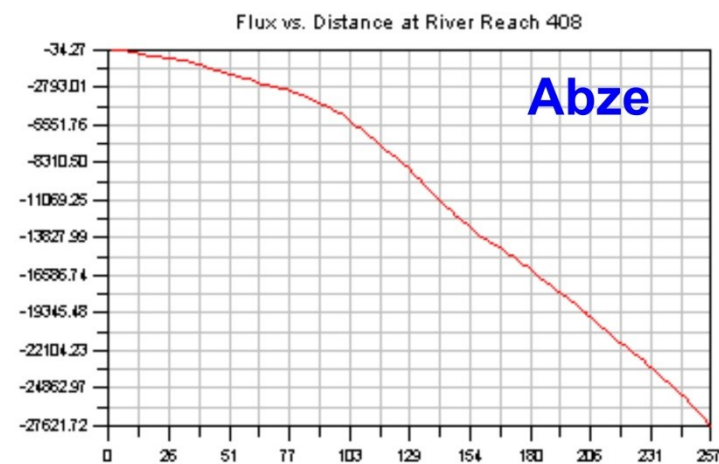
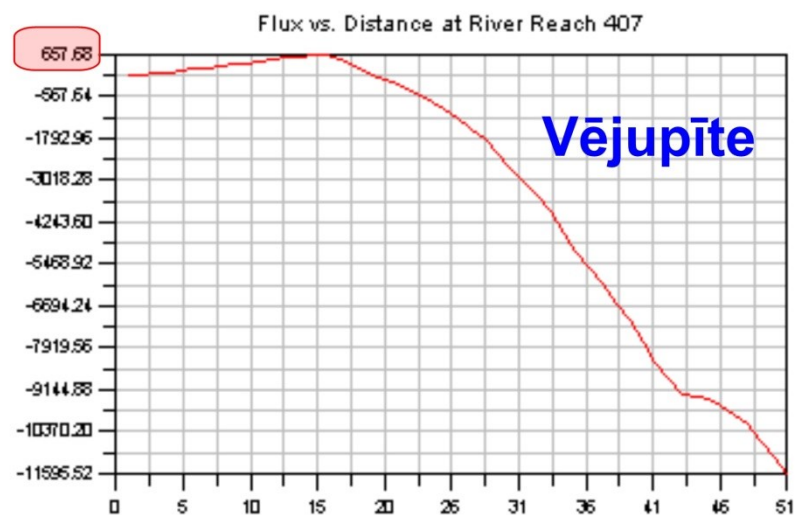


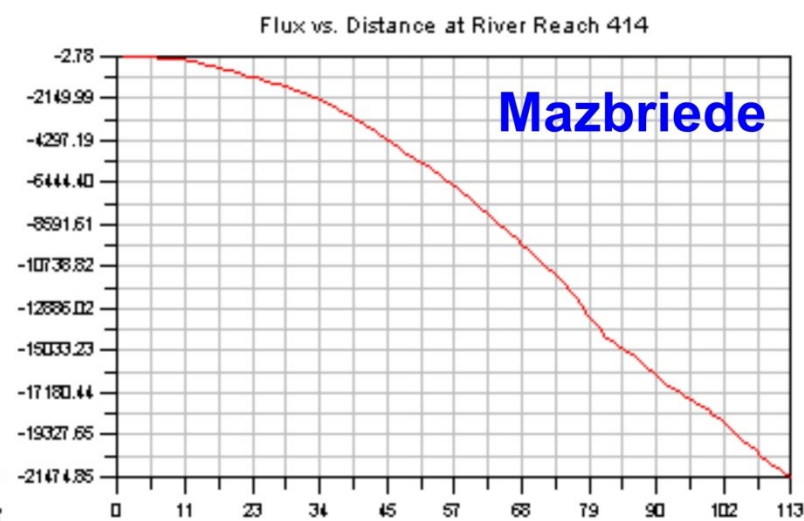
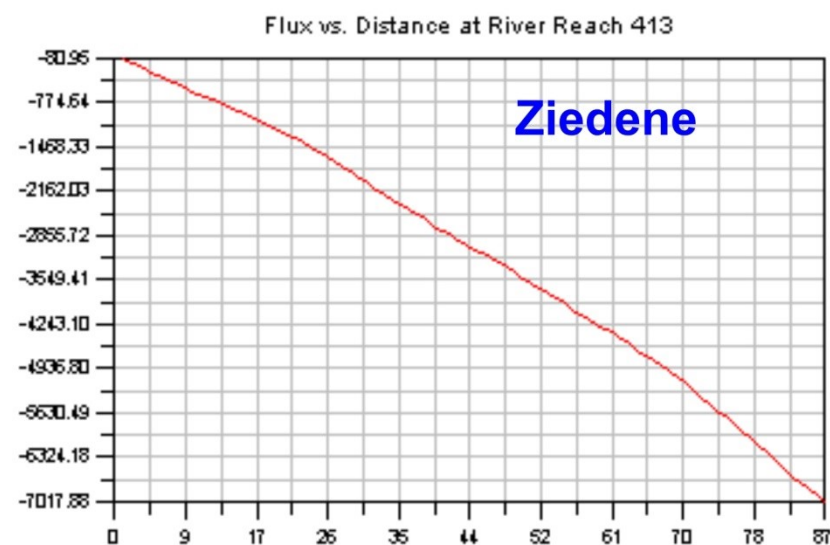
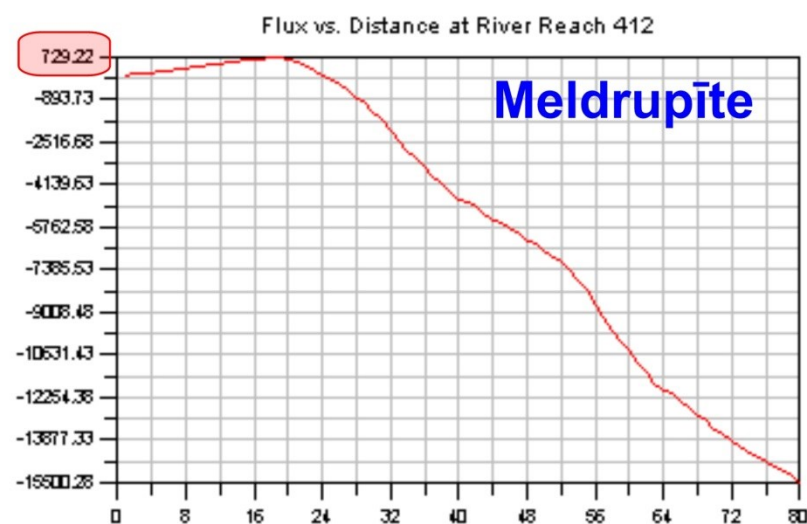
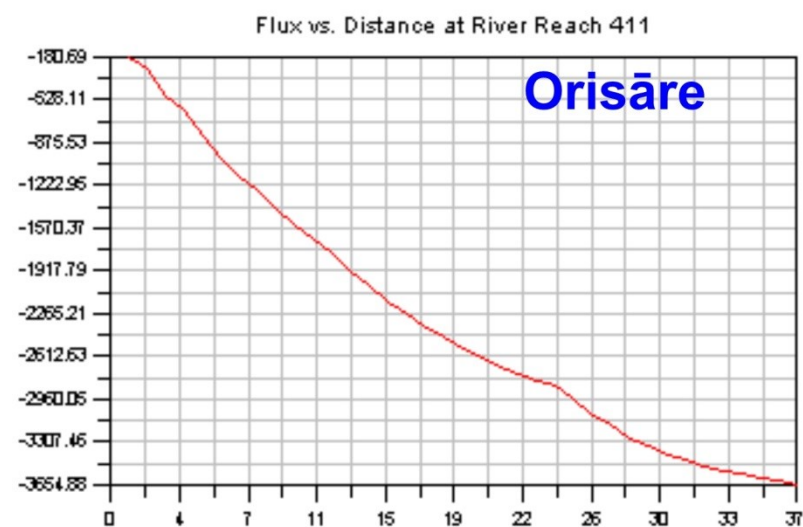


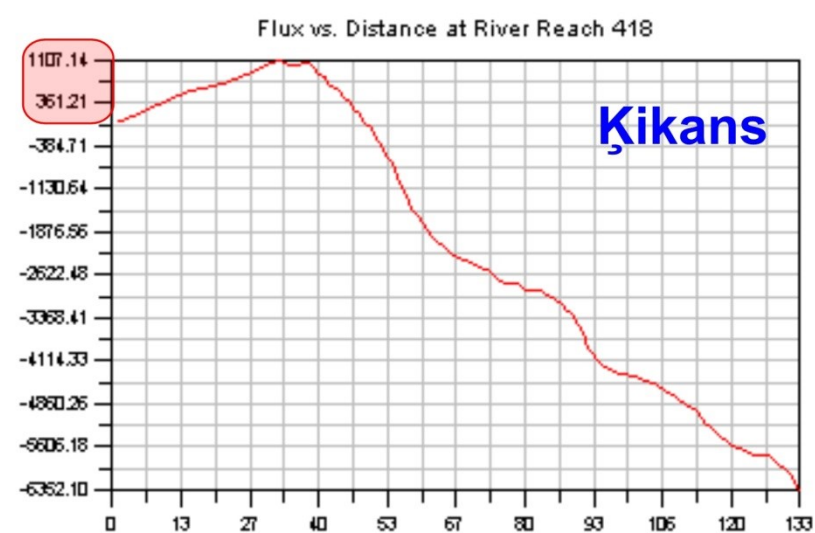
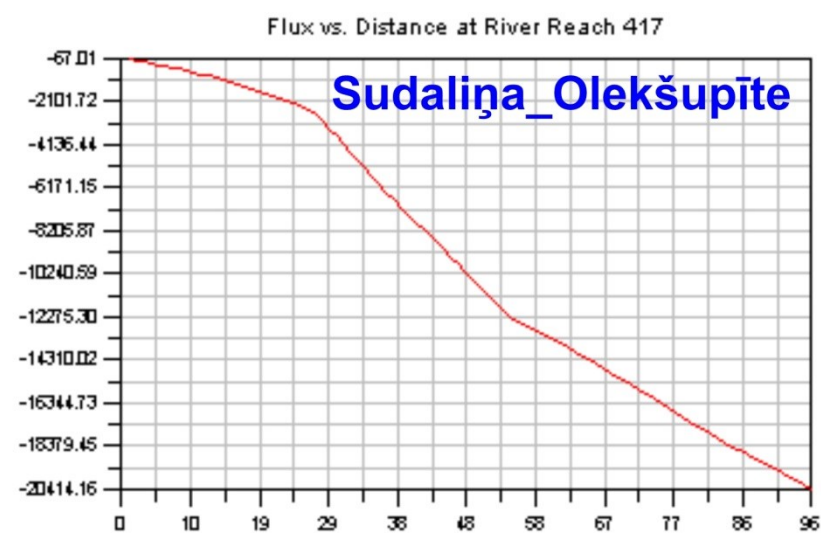
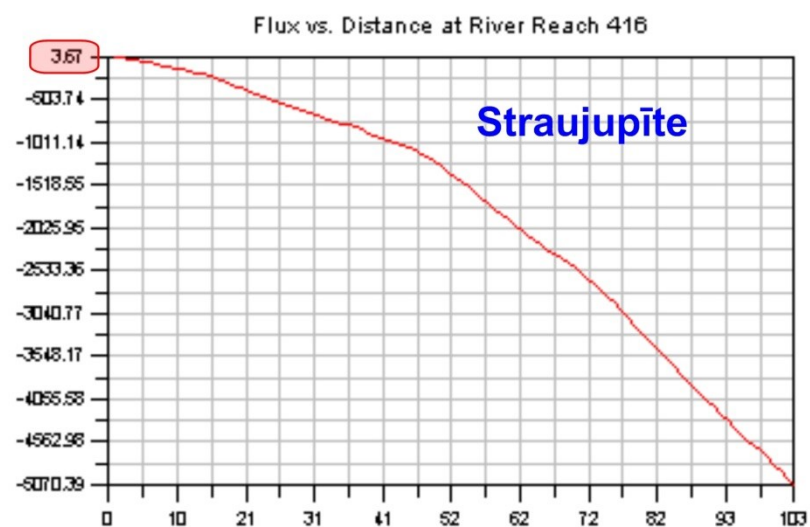
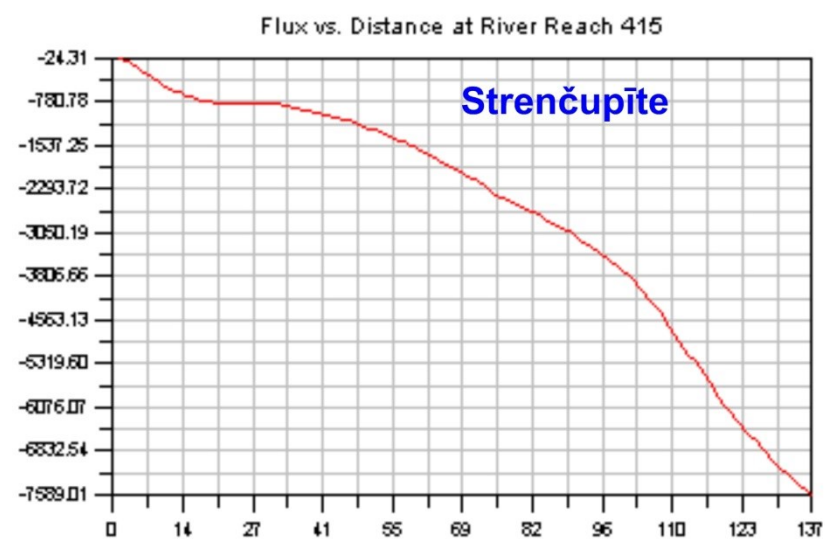


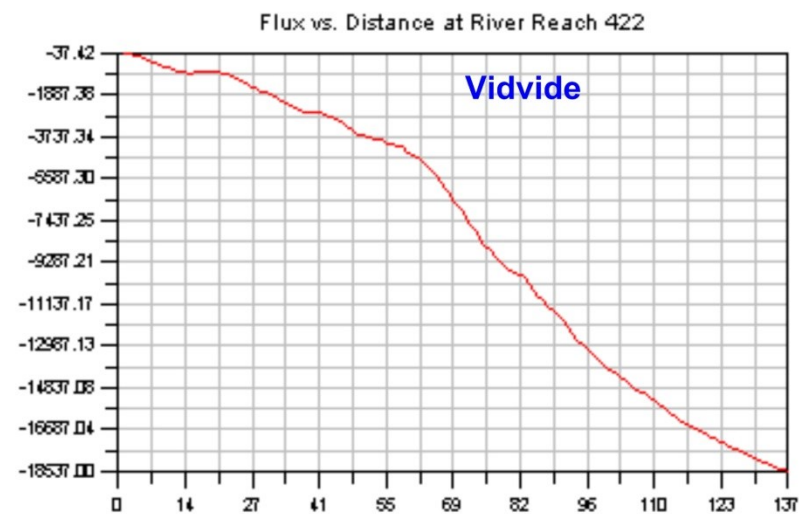
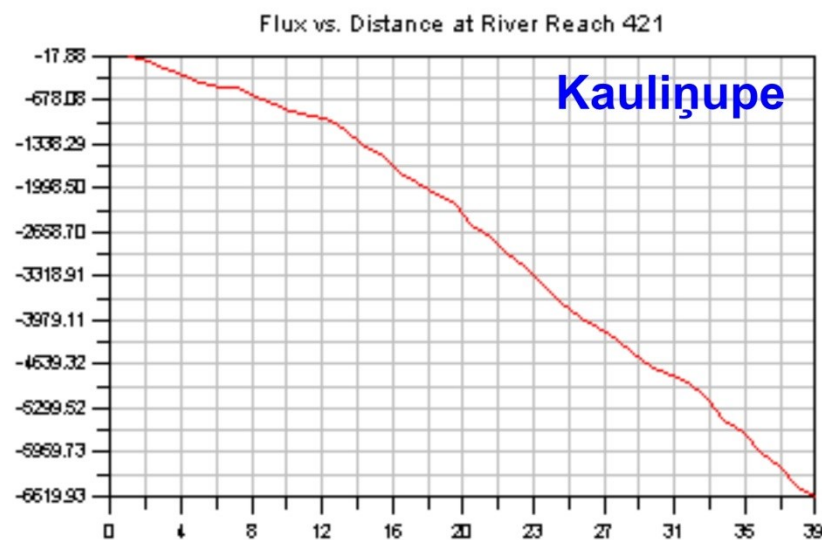
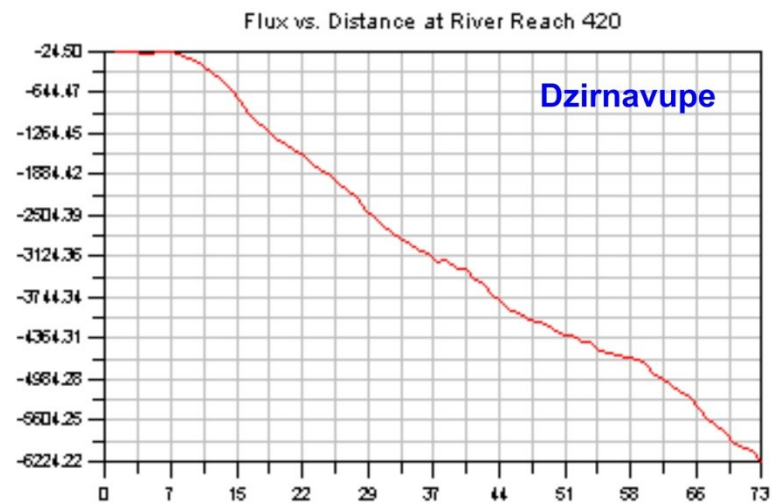
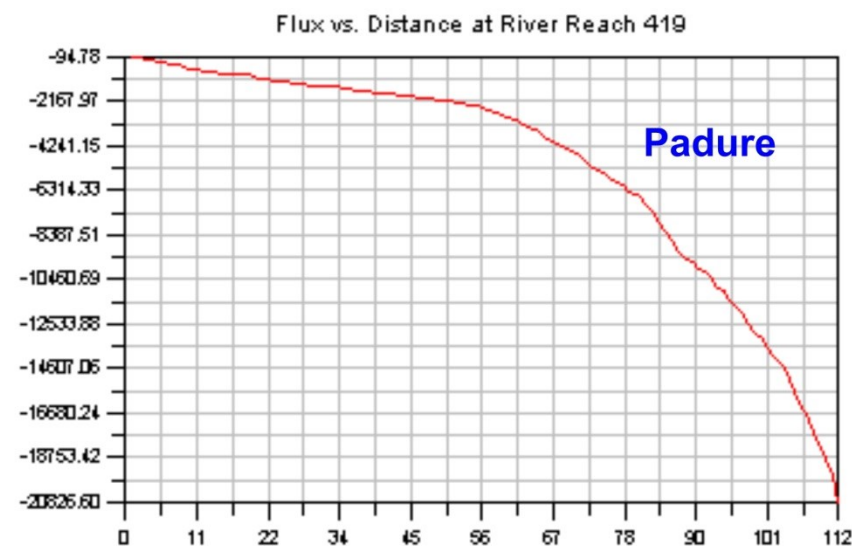


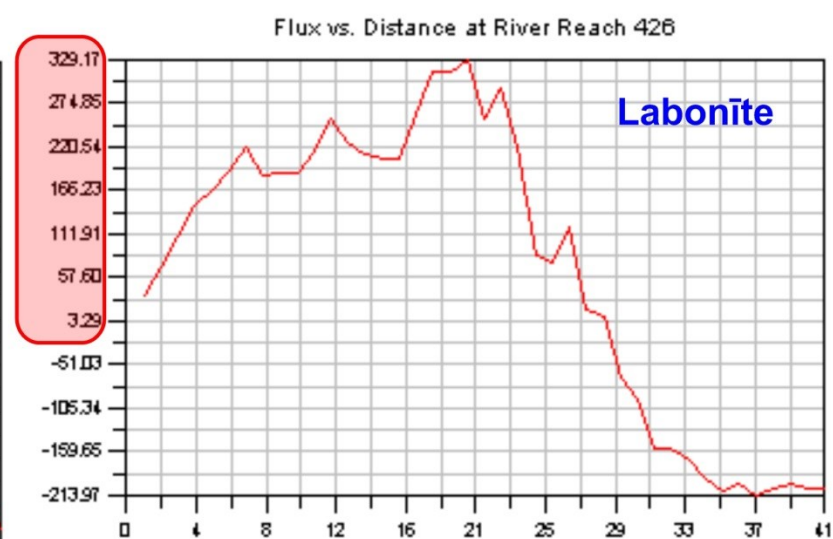
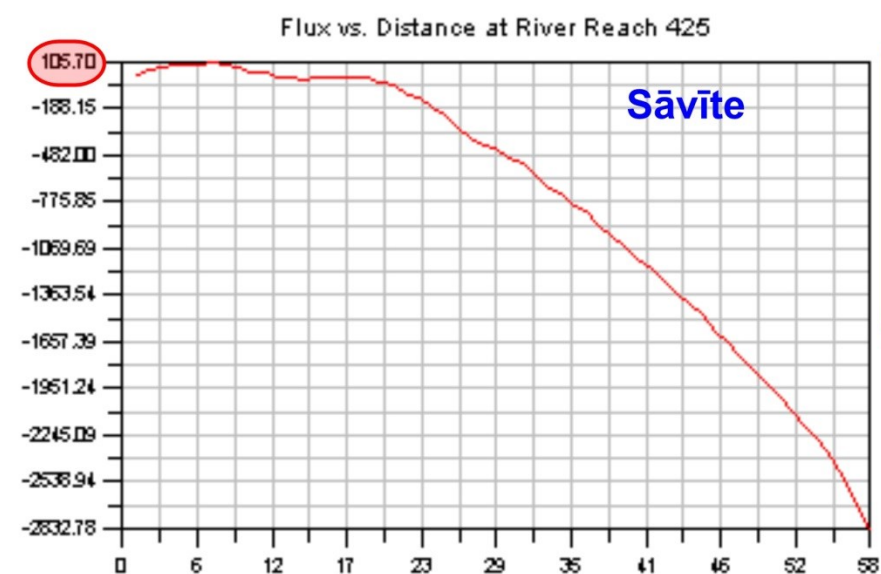
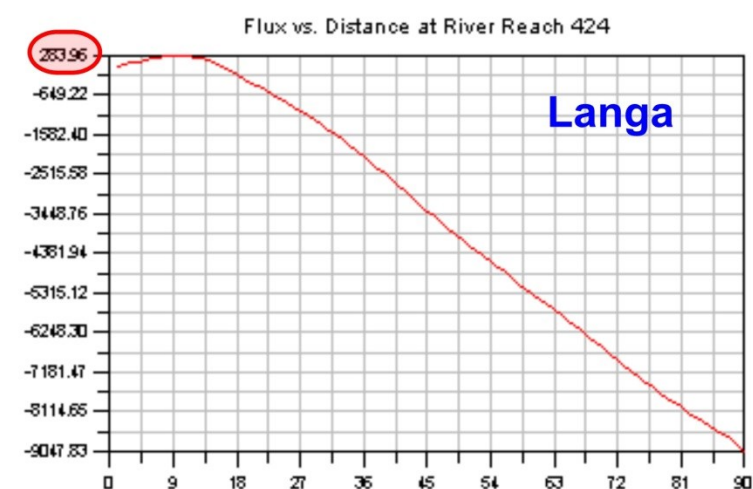
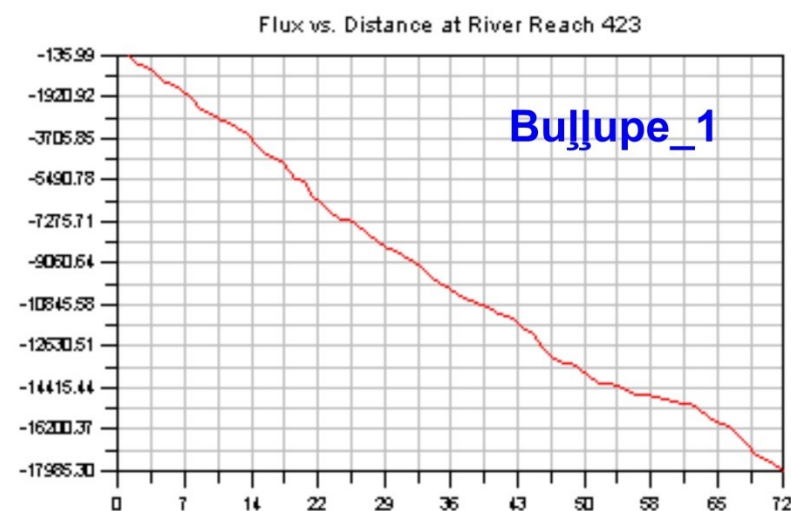


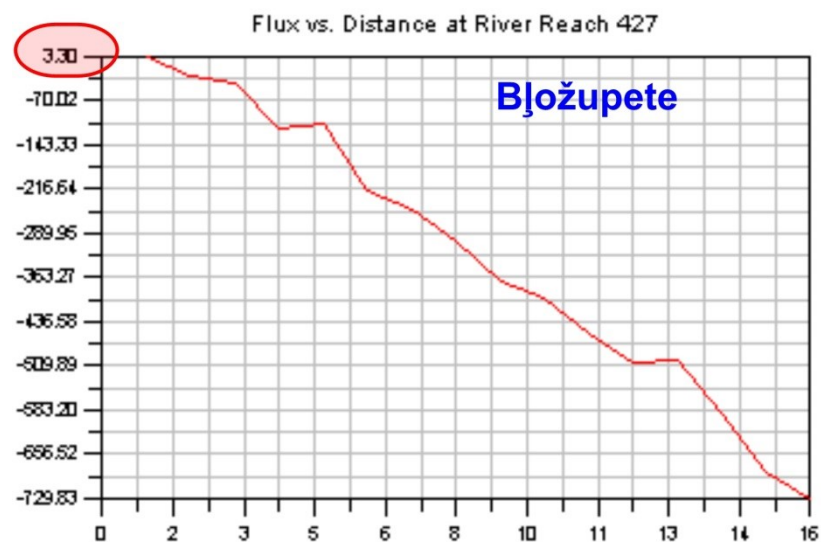












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