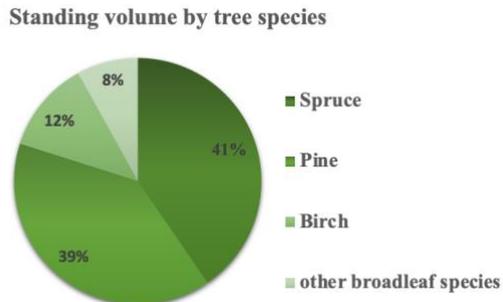
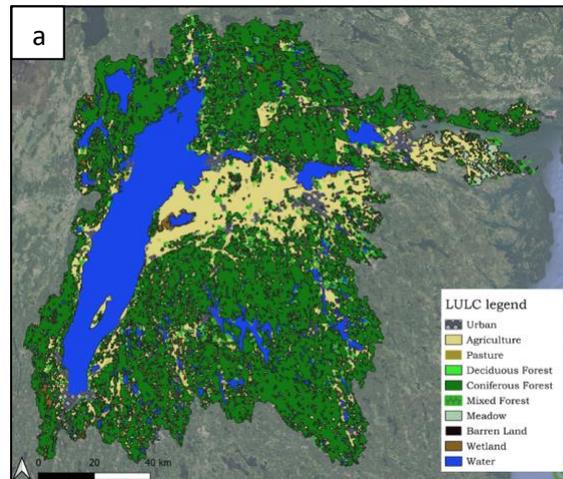


## Supplementary figures

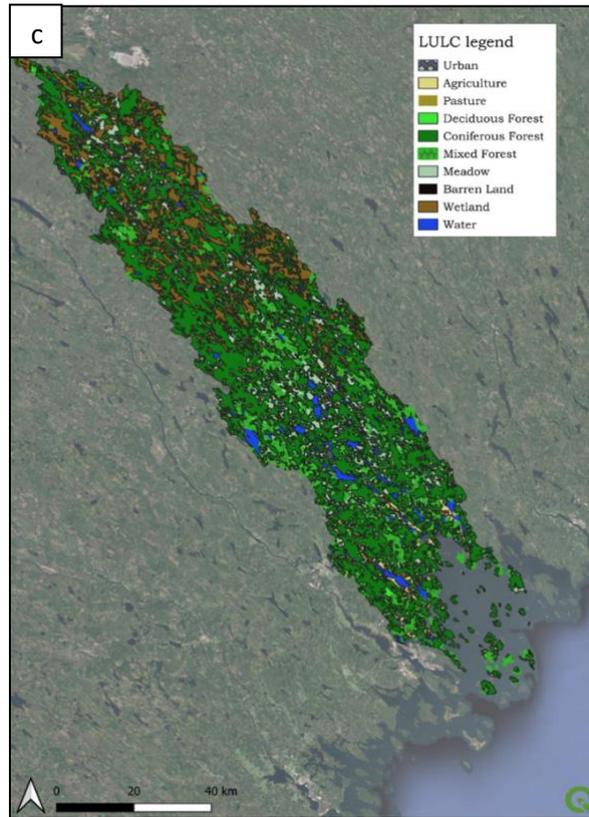
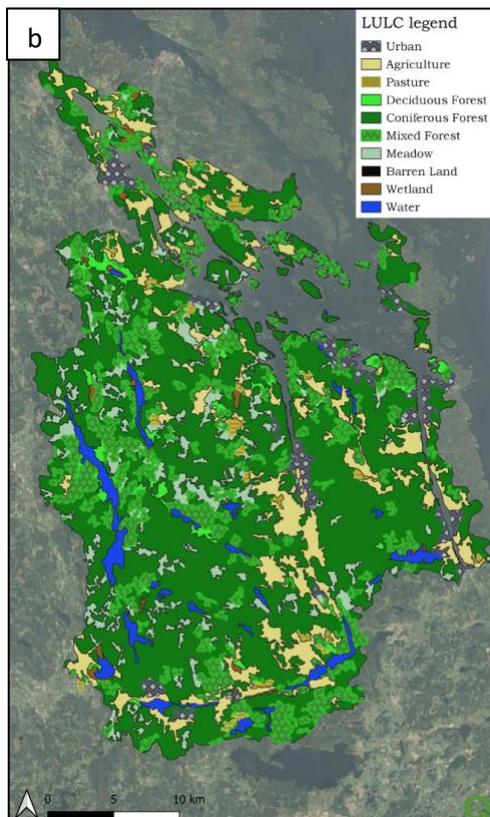
Manuscript: Links between land cover and in-water optical properties in four optically contrasting Swedish bays by Susanne Kratzer and Martin Allart



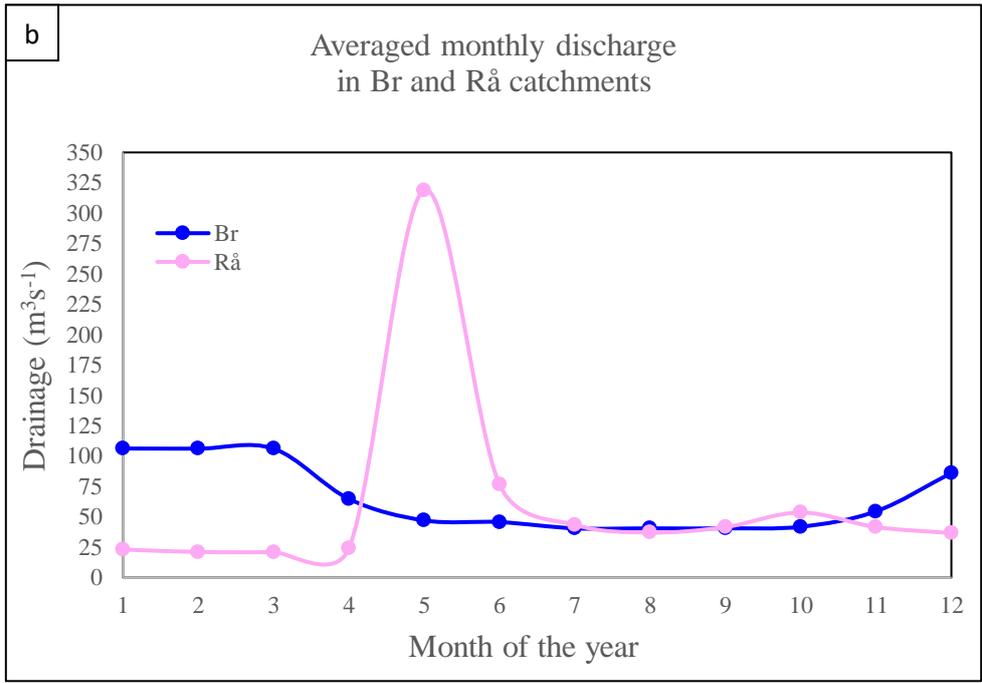
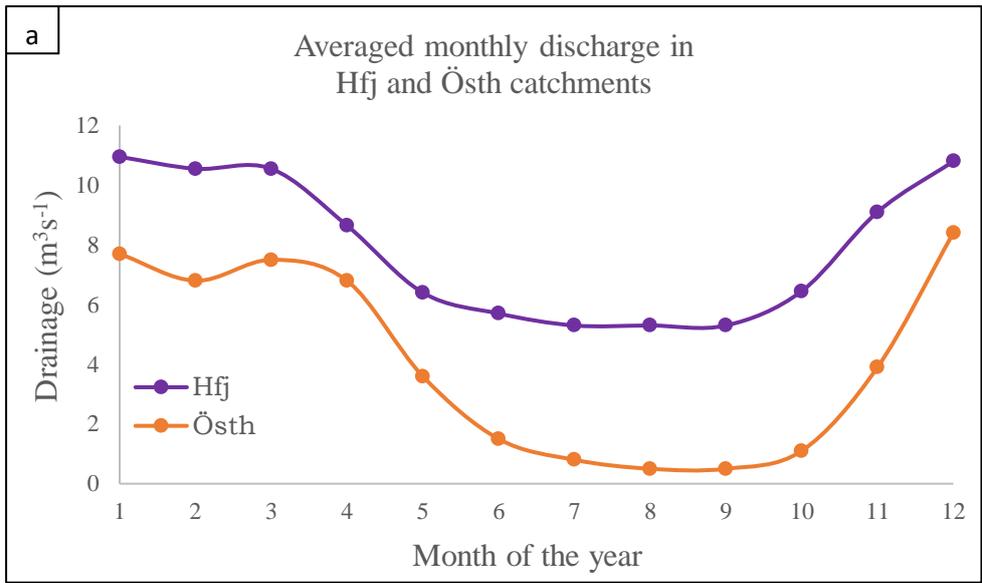
Supplementary Fig. S1: Swedish standing volume by Swedish tree species in percent. Adapted from: SLU [32].



Supplementary Fig. S2a: Landcover map for Bråviken bay.



Supplementary Fig. S2b: Landcover map for Östhammar bay and S2c: Landcover map for the Råneå estuary. Maps generated in QGIS using predefined shapefiles (Europe-an coastline shapefile [22]). Recurrence layer – Global Surface Water, Surface elevation – Copernicus EU-DEM- v1.1; Sentinel Hub [24]. Water course network (vattendraglinjer nätverk), SVAR (Svenskt Vat-tenARKiv, [25]).



**Supplementary Figure S3a:** Freshwater discharge value per catchment for the Himmerfjärden bay and Östhammar bay, and **Supplementary Figure S3b)** freshwater discharge value per catchment for Bråviken bay and Råneå bay. The values were derived from the SMHI interactive map (SMHI, Hydrologiskt Nuläge, Vattenwebb (in English: Current Hydrological Status, Water Web), available online [26] by summing up all contribution of the smaller watersheds and greater catchments contributing in the considered bay. The averaged value from the time period 1991 to 2021 of the water flows for every month were noted down in an Excel spreadsheet and then added to obtain the graphs shown above.

**Supplementary Table S1:** Corine nomenclature - Code18; Nomenclature adapted from Copernicus Land Monitoring service, available online [22]



Supplementary Table S2: Bio-optical dataset used in this study

Area	Distance (km) from outlet	Date	UTC+2hrs Time	Position	Chl-a	total SPM	SPIM	SPOM	Turbidity	CDOM linear fitting (700*)			
(group)	Location		SE_ (summer)	Lat	Long	µg/l	g/m3	g/m3	g/m3	FNU	a <sub>CDOM</sub> (440)	S <sub>CDOM</sub>	
Bråviken	BR7b	21.73	28/04/2022	15:20	58.62014	16.68841	4.38	2.12	1.60	0.52	1.71	0.55	-0.019
(MRSG)	BR3	10.62	28/04/2022	17:20	58.64501	16.49279	9.32	3.98	1.43	2.55	3.21	1.02	-0.018
	BR4	3.99	29/04/2022	09:15	58.64374	16.37258	8.03	4.00	1.74	2.25	3.11	1.10	-0.018
	BR7	21.34	29/04/2022	10:55	58.61834	16.68158	6.06	3.48	1.46	2.02	2.85	0.98	-0.018
	BR2	30.04	29/04/2022	12:15	58.59690	16.82914	2.90	3.82	1.54	2.28	2.08	0.69	-0.019
(MRSG)	BR5	0.00	25/04/2018	08:58	58.62553	16.31293	8.77	4.11	3.15	0.96	4.38	1.36	-0.018
	BR2	30.05	25/04/2018	13:55	58.59676	16.82916	12.74	2.74	1.85	0.89	2.23	0.92	-0.017
	BR3	10.46	25/04/2018	15:57	58.63990	16.49166	12.65	4.24	3.26	0.98	4.38	1.26	-0.018
	BR4	4.00	25/04/2018	17:20	58.64368	16.37263	9.66	4.91	3.78	1.13	5.07	1.62	-0.018
(MRSG)	BR1	41.69	24/04/2018	11:52	58.56440	17.02323	25.05	3.64	1.98	1.67	2.53	1.02	-0.017
	BR6	4.59	24/04/2018	10:11	58.63999	16.38735	9.24	4.47	3.42	1.05	4.56	1.50	-0.018
	BR7	21.35	24/04/2018	11:53	58.61839	16.68164	12.43	3.72	2.86	0.86	3.87	1.01	-0.018
	BR8	36.23	24/04/2018	13:30	58.58236	16.93324	12.65	2.26	1.41	0.85	1.81	0.72	-0.018
(MG)	GB20	3.99	17/06/2013	N/A	58.61330	16.77492	6.70	2.41	2.14	0.27	N/A	0.75	N/A
	GB16w2	26.77	17/06/2013	N/A	58.63953	16.38868	6.40	4.30	3.80	0.50	N/A	0.83	N/A
(MG)	GB16w2	3.99	18/06/2012	N/A	58.61330	16.77492	3.10	3.14	2.31	0.83	3.74	0.55	N/A
	GB20	26.77	18/06/2012	N/A	58.63953	16.38868	9.70	4.36	3.18	1.18	5.48	1.09	N/A
(MRSG)	BR5	0.00	02/07/2021	09:55	58.62560	16.31295	6.62	N/A	N/A	N/A	5.51	1.27	-0.018
	BR2; GB16	30.04	01/07/2021	13:52	58.59678	16.82910	7.02	N/A	N/A	N/A	1.83	0.82	-0.018
	BR3; BG22	10.45	01/07/2021	14:30	58.63992	16.49152	4.74	N/A	N/A	N/A	4.00	0.79	-0.018
	BR4; BG20	3.99	01/07/2021	17:40	58.64372	16.37249	5.20	N/A	N/A	N/A	2.61	0.76	-0.018
	BR7b	21.73	02/07/2021	12:12	58.62039	16.68846	3.46	N/A	N/A	N/A	1.78	0.77	-0.017
	BR9	36.46	02/07/2021	16:10	58.59784	16.94074	3.65	N/A	N/A	N/A	1.24	0.42	-0.018

<b>(MG)</b>	<b>GB20</b>	3.99	09/07/2013	N/A	58.61330	16.77492	18.00	6.77	4.90	1.87	N/A	1.26	N/A
	<b>GB16w2</b>	26.77	09/07/2013	N/A	58.63953	16.38868	4.00	5.51	4.77	0.74	N/A	0.82	N/A
	<b>GB20</b>	3.99	12/08/2013	N/A	58.61330	16.77492	9.70	6.05	4.44	1.61	N/A	0.89	N/A
	<b>GB16w2</b>	26.77	12/08/2013	N/A	58.63953	16.38868	6.90	4.45	3.52	0.94	N/A	0.73	N/A
	<b>GB16w2</b>	3.99	20/08/2012	N/A	58.61330	16.77492	4.90	3.66	2.85	0.81	4.80	0.92	N/A
	<b>GB20</b>	26.77	20/08/2012	N/A	58.63953	16.38868	5.40	5.20	4.33	0.86	7.48	0.96	N/A
<b>Himmerfjärden</b>	<b>H5</b>	0.00	17/04/2018	12:52	59.03783	17.72600	N/A	N/A	N/A	N/A	1.39	0.62	-0.019
<b>(MRSG)</b>	<b>H3</b>	11.50	17/04/2018	10:55	58.93433	17.72600	N/A	N/A	N/A	N/A	1.32	0.58	-0.019
	<b>H4</b>	6.00	17/04/2018	10:05	58.98383	17.72433	7.08	N/A	N/A	N/A	1.55	0.60	-0.019
	<b>B1</b>	26.71	17/04/2018	08:20	58.80333	17.62367	3.37	N/A	N/A	N/A	0.77	0.34	-0.021
<b>(MRSG)</b>	<b>H4</b>	6.22	27/04/2012	13:20	58.98393	17.72516	13.70	2.53	1.01	1.51	1.96	0.54	-0.017
	<b>H3</b>	11.51	27/04/2012	14:15	58.84250	17.79033	5.05	1.51	0.61	0.91	1.11	0.50	-0.017
	<b>H2</b>	21.80	27/04/2012	15:00	58.93433	17.72600	3.39	1.15	0.52	0.64	1.09	0.34	-0.018
	<b>H5</b>	0.00	10/05/2012	13:50	59.03727	17.72016	3.66	1.22	0.43	0.79	1.26	0.60	-0.016
<b>(MRSG)</b>	<b>H2</b>	22.10	10/05/2012	11:35	58.84156	17.78891	1.81	0.75	0.27	0.48	0.75	0.33	-0.019
	<b>H4</b>	5.93	10/05/2012	12:55	58.98394	17.72540	4.69	1.48	0.62	0.86	1.13	0.53	-0.017
	<b>B1</b>	26.56	10/05/2012	10:17	58.80341	17.62467	1.60	0.96	0.40	0.57	0.80	0.43	-0.016
<b>(MRSG)</b>	<b>H5</b>	0.00	20/06/2001	08:00	59.03650	17.72333	3.61	1.93	1.24	0.69	N/A	0.58	-0.019
	<b>H4</b>	5.78	20/06/2001	09:05	58.98450	17.72667	4.17	2.20	1.36	0.84	N/A	0.52	-0.019
	<b>H3</b>	11.40	20/06/2001	11:00	58.93400	17.73017	1.81	1.70	1.20	0.51	N/A	0.50	-0.019
	<b>H2</b>	22.17	20/06/2001	11:35	58.84000	17.79033	1.34	0.88	0.43	0.45	N/A	0.39	-0.019
	<b>B1</b>	26.35	20/06/2001	12:40	58.80467	17.62667	1.32	0.48	0.21	0.28	N/A	0.39	-0.019
<b>(MRSG)</b>	<b>H5</b>	0.00	21/07/2017	10:30	59.03657	17.72120	2.98	1.64	0.72	0.92	1.55	0.59	-0.017
	<b>H4</b>	5.86	21/07/2017	12:15	58.98390	17.72423	6.11	1.80	0.62	1.19	1.58	0.45	-0.019
	<b>H3</b>	11.39	21/07/2017	13:10	58.93407	17.72675	5.10	1.60	0.56	1.04	1.33	0.47	-0.017
	<b>B1</b>	26.57	21/07/2017	13:15	58.80280	17.62400	2.63	0.77	0.18	0.59	0.58	0.39	-0.018
<b>(MRSG)</b>	<b>H4</b>	5.68	15,18,28		58.98386	17.72388	7.16	2.69	1.10	1.59	N/A	0.75	-0.014

<b>Averaged 3 trans</b>	<b>H3</b>	11.21			58.93408	17.72676	5.68	2.39	1.04	1.35	N/A	0.43	-0.018
	<b>H2</b>	22.95			58.82847	17.73230	4.44	1.51	0.47	1.05	N/A	0.49	-0.017
<b>(MRS G)</b>	<b>H3</b>	5.62	02/07/2001	09:25	58.93400	17.73017	4.96	2.48	1.33	1.15	N/A	0.46	-0.018
	<b>H2</b>	16.47	02/07/2001	10:45	58.84000	17.79033	3.49	1.21	0.31	0.90	N/A	0.50	-0.018
<b>(MG)</b>	<b>B1</b>	20.79	02/07/2001	11:05	58.80467	17.62667	3.40	1.71	0.63	1.08	N/A	0.41	-0.018
	<b>H5</b>	0.00	21/08/2017	13:36	59.03780	17.72598	6.66	N/A	N/A	N/A	1.86	N/A	N/A
	<b>H2</b>	11.50	21/08/2017	09:10	58.84250	17.79033	3.85	N/A	N/A	N/A	0.77	0.31	-0.021
	<b>H3</b>	6.00	21/08/2017	11:08	58.93433	17.72600	4.59	N/A	N/A	N/A	1.37	0.38	-0.019
	<b>H4</b>	26.70	21/08/2017	10:15	58.98378	17.72435	4.72	1.72	0.89	0.84	1.01	0.39	-0.020
<b>(MRS G)</b>	<b>B1</b>	22.01	21/08/2017	07:45	58.80317	17.62533	1.82	1.25	0.25	1.00	1.50	0.30	-0.021
	<b>H4</b>	5.93	20/08/2010	08:20	58.98394	17.72428	5.70	1.76	1.08	0.67	N/A	0.80	-0.014
	<b>H2</b>	22.06	20/08/2010	10:10	58.84134	17.78222	4.25	1.65	0.57	1.09	N/A	0.44	-0.017
<b>(MRS G)</b>	<b>B1</b>	26.63	20/08/2010	11:30	58.80265	17.62538	6.32	1.72	0.43	1.29	N/A	0.40	-0.017
	<b>H5</b>	0.00	12,22		59.03693	17.72186	4.06	1.92	0.90	1.01	N/A	0.66	-0.018
<b>Average 2 transects</b>	<b>H4</b>	5.91			58.98374	17.72397	4.74	1.77	0.70	1.06	N/A	0.60	-0.017
	<b>H3</b>	11.47			58.93374	17.72915	4.16	1.67	0.55	1.12	N/A	0.46	-0.017
	<b>H2</b>	22.16			58.84055	17.78911	3.80	1.14	0.22	0.92	N/A	0.42	-0.017
	<b>Östhammar</b>	<b>U11</b>	22.96	17/07/2021	08:23	60.16031	18.58518	2.65	N/A	N/A	N/A	1.01	0.81
<b>(MG)</b>	<b>U13</b>	18.17	17/07/2021	07:08	60.17682	18.48382	4.09	N/A	N/A	N/A	2.50	1.00	-0.017
	<b>U18</b>	9.41	17/07/2021	06:09	60.24931	18.41649	23.47	N/A	N/A	N/A	7.00	2.32	-0.016
<b>(MG)</b>	<b>U14</b>	14.43	17/07/2021	06:24	60.21550	18.47713	8.85	N/A	N/A	N/A	3.43	1.23	-0.017
	<b>U11</b>	22.96	11/07/2020	08:00	60.16031	18.58518	4.19	N/A	N/A	N/A	1.63	0.87	-0.018
	<b>U13</b>	18.17	11/07/2020	06:46	60.17682	18.48382	2.74	N/A	N/A	N/A	2.61	1.08	-0.018
	<b>U18</b>	9.41	11/07/2020	05:59	60.24931	18.41649	22.90	N/A	N/A	N/A	6.12	1.16	-0.018
<b>(MG)</b>	<b>U14</b>	14.43	11/07/2020	05:32	60.21550	18.47713	3.41	N/A	N/A	N/A	3.16	1.16	-0.017
	<b>U11</b>	22.96	13/07/2019	10:00	60.16031	18.58518	4.16	N/A	N/A	N/A	2.67	N/A	N/A
	<b>U13</b>	18.17	13/07/2019	08:45	60.17682	18.48382	3.92	N/A	N/A	N/A	3.11	N/A	N/A

	<b>U18</b>	9.41	13/07/2019	07:58	60.24931	18.41649	30.79	N/A	N/A	N/A	6.60	N/A	N/A
	<b>U14</b>	14.43	13/07/2019	07:29	60.21550	18.47713	7.49	N/A	N/A	N/A	4.11	N/A	N/A
<b>(MG)</b>	<b>U22</b>	2.46	29/07/2010	N/A	60.29772	18.33597	89.88	N/A	N/A	N/A	N/A	N/A	N/A
	<b>U18</b>	9.41	21/07/2010	N/A	60.24931	18.41649	17.37	N/A	N/A	N/A	N/A	1.52	-0.015
	<b>U14</b>	14.43	21/07/2010	N/A	60.21550	18.47713	9.28	4.77	0.72	4.06	N/A	2.46	-0.010
	<b>U13</b>	18.17	21/07/2010	N/A	60.17682	18.48382	3.30	7.42	3.89	3.53	N/A	0.91	-0.016
	<b>U11</b>	22.96	21/07/2010	N/A	60.16031	18.58518	2.72	N/A	N/A	N/A	N/A	0.95	-0.017
	<b>U15</b>	28.26	21/07/2010	N/A	60.15101	18.70181	2.30	1.75	0.26	1.49	N/A	1.17	-0.015
<b>(MG)</b>	<b>U11</b>	22.96	14/08/2021	07:49	60.16031	18.58518	5.52	N/A	N/A	N/A	0.93	0.60	-0.018
	<b>U13</b>	18.17	14/08/2021	06:37	60.17682	18.48382	8.44	N/A	N/A	N/A	2.58	0.61	-0.018
	<b>U18</b>	9.41	14/08/2021	05:45	60.24931	18.41649	46.51	N/A	N/A	N/A	7.25	0.86	-0.018
	<b>U14</b>	14.43	14/08/2021	06:14	60.21550	18.47713	15.47	N/A	N/A	N/A	4.25	0.81	-0.018
<b>(MG)</b>	<b>U11</b>	22.96	08/08/2020	07:56	60.16031	18.58518	2.96	N/A	N/A	N/A	1.05	1.20	-0.017
	<b>U13</b>	18.17	08/08/2020	06:43	60.17682	18.48382	2.56	N/A	N/A	N/A	1.72	0.74	-0.018
	<b>U18</b>	9.41	08/08/2020	05:55	60.24931	18.41649	31.19	N/A	N/A	N/A	5.48	0.86	-0.018
	<b>U14</b>	14.43	08/08/2020	05:29	60.21550	18.47713	9.59	N/A	N/A	N/A	3.65	0.74	-0.018
<b>(MG)</b>	<b>U11</b>	22.96	10/08/2019	09:27	60.16031	18.58518	6.07	N/A	N/A	N/A	1.92	0.77	-0.018
	<b>U13</b>	18.17	10/08/2019	08:12	60.17682	18.48382	9.73	N/A	N/A	N/A	3.16	0.90	-0.018
	<b>U18</b>	9.41	10/08/2019	07:24	60.24931	18.41649	23.24	N/A	N/A	N/A	6.56	N/A	N/A
	<b>U14</b>	14.43	10/08/2019	06:59	60.21550	18.47713	12.96	N/A	N/A	N/A	4.46	N/A	N/A
<b>(MG)</b>	<b>U18</b>	9.41	20/08/2010	N/A	60.24931	18.41649	36.20	N/A	N/A	N/A	N/A	1.24	-0.016
	<b>U14</b>	14.43	20/08/2010	N/A	60.21550	18.47713	15.81	14.54	0.94	13.59	N/A	0.92	-0.017
	<b>U13</b>	18.17	20/08/2010	N/A	60.17682	18.48382	6.24	7.56	0.64	6.92	N/A	0.90	-0.017
	<b>U11</b>	22.96	20/08/2010	N/A	60.16031	18.58518	2.35	5.07	0.55	4.52	N/A	0.70	-0.017
<b>(MRSG)</b>	<b>RA6</b>	3.60	16/05/2018	16:05	65.83400	22.43067	0.55	7.10	4.16	2.94	8.90	5.18	-0.016
	<b>RA7</b>	10.72	16/05/2018	15:30	65.74501	22.49570	2.52	3.49	1.67	1.82	2.49	2.99	-0.016
	<b>RA2</b>	11.15	16/05/2018	16:50	65.72965	22.44760	1.03	11.60	6.79	4.81	2.40	2.65	-0.016
	<b>RA8</b>	22.14	16/05/2018	19:20	65.64150	22.55783	1.80	3.13	1.50	1.63	2.56	2.93	-0.016

<b>(MRSG)</b>	<b>RA8</b>	22.12	13/06/2018	13:30	65.64193	22.55905	1.89	0.90	0.59	0.31	0.64	1.83	-0.017
	<b>RA6</b>	3.60	13/06/2018	16:00	65.83400	22.43067	4.60	2.72	1.22	1.50	1.76	2.82	-0.016
	<b>RA7</b>	10.85	13/06/2018		65.74377	22.49654	1.71	1.04	0.62	0.42	1.21	1.25	-0.017
	<b>RA2</b>	11.10	13/06/2018	17:40	65.73004	22.44725	1.70	2.09	1.46	0.63	0.72	1.30	-0.017
<b>(MRSG)</b>	<b>RA8</b>	22.16	11/07/2018	14:33	65.64138	22.55826	5.69	3.13	1.21	1.93	0.97	1.15	-0.018
	<b>RA2</b>	11.08	11/07/2018	16:36	65.73017	22.44639	3.47	2.92	1.57	1.35	0.72	1.24	-0.018
	<b>RA6</b>	3.60	11/07/2018	16:20	65.83400	22.43067	2.60	4.31	2.39	1.92	1.46	1.59	-0.018
	<b>RA7</b>	10.78	11/07/2018	19:50	65.74464	22.49641	3.15	3.43	1.97	1.47	0.66	1.23	-0.018