

## Hourly Astronomical Tide Level at Shiogama port, Miyagi Pref. in 2011 (unit: centimeter) Issued by JMA

Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Jun	W	29	42	49	46	33	11	-17	-46	-70	-84	-85	-72	-49	-21	6	27	38	39	31	19	7	-1	0	8	
2-Jun	Th	New Moon	22	38	49	53	45	27	0	-31	-60	-82	-91	-86	-68	-41	-11	16	34	41	39	29	15	4	-1	3
3-Jun	F		15	30	46	55	54	41	18	-12	-44	-72	-90	-93	-83	-60	-31	-1	23	38	41	35	23	10	1	0
4-Jun	Sa		7	21	37	51	57	51	34	8	-24	-55	-79	-92	-90	-75	-50	-20	8	28	39	38	30	17	6	-1
5-Jun	Su		1	10	26	42	53	54	45	25	-3	-34	-62	-82	-89	-83	-64	-38	-9	15	31	37	34	24	11	1
6-Jun	M		-3	1	12	27	42	50	48	36	15	-12	-40	-64	-79	-81	-71	-51	-25	0	21	33	35	29	18	6
7-Jun	Tu		-3	-6	0	11	25	37	42	39	27	7	-17	-41	-60	-70	-69	-56	-36	-13	9	26	34	33	24	12
8-Jun	W		0	-8	-10	-5	5	17	27	32	29	18	2	-18	-37	-51	-57	-53	-41	-22	-1	18	30	34	31	21
9-Jun	Th	First Quarter	8	-5	-14	-17	-13	-5	5	14	20	19	13	1	-13	-27	-38	-41	-37	-25	-8	10	25	34	36	30
10-Jun	F		18	3	-11	-22	-27	-26	-19	-10	1	9	13	12	6	-4	-14	-22	-25	-21	-11	4	20	33	39	38
11-Jun	Sa		30	16	-1	-18	-32	-40	-41	-36	-25	-11	1	10	15	14	8	0	-7	-10	-8	1	15	29	40	44
12-Jun	Su		42	31	14	-6	-27	-44	-55	-57	-51	-38	-20	-3	12	21	24	20	13	5	1	3	11	23	37	47
13-Jun	M		50	46	33	12	-12	-36	-57	-70	-72	-63	-46	-24	-2	17	29	33	30	22	13	8	9	17	30	44
14-Jun	Tu		54	56	50	33	10	-18	-46	-69	-82	-83	-71	-50	-23	3	24	37	41	36	26	16	11	12	22	36
15-Jun	W		50	60	62	52	33	5	-26	-56	-79	-90	-88	-72	-47	-18	10	31	43	44	37	26	15	10	13	25
16-Jun	Th	Full Moon	41	56	65	65	53	30	-1	-34	-65	-86	-94	-87	-68	-40	-9	18	37	46	44	34	22	11	7	13
17-Jun	F		27	45	60	68	65	50	24	-9	-42	-71	-88	-92	-80	-58	-28	2	26	42	46	40	28	14	5	4
18-Jun	Sa		12	29	47	62	68	61	43	15	-18	-49	-74	-86	-84	-68	-43	-14	13	33	43	43	34	20	6	-1
19-Jun	Su		0	12	29	47	60	63	53	33	4	-26	-54	-72	-79	-71	-53	-27	0	23	38	43	38	26	11	-1
20-Jun	M		-7	-2	11	28	45	54	54	42	21	-6	-33	-55	-67	-67	-55	-35	-10	14	32	41	40	31	17	3
21-Jun	Tu		-8	-11	-5	9	25	38	45	42	29	9	-14	-36	-51	-57	-52	-37	-17	5	25	37	41	36	25	10
22-Jun	W		-4	-13	-15	-8	4	18	29	33	29	17	0	-18	-34	-43	-44	-35	-20	-1	18	33	40	40	32	18
23-Jun	Th	Last Quarter	4	-9	-17	-18	-13	-2	9	18	22	18	9	-4	-17	-27	-31	-29	-19	-4	12	27	37	41	37	27
24-Jun	F		13	-1	-14	-22	-24	-20	-11	-1	7	12	11	5	-3	-11	-17	-18	-14	-5	8	21	33	40	40	34
25-Jun	Sa		23	9	-6	-19	-28	-31	-29	-21	-11	-1	6	8	7	3	-2	-5	-5	-2	6	16	27	36	41	40
26-Jun	Su		33	21	5	-11	-26	-37	-41	-39	-30	-18	-6	5	11	14	12	9	6	5	7	13	22	31	39	43
27-Jun	M		40	32	18	1	-18	-35	-47	-52	-48	-37	-22	-6	9	19	23	22	19	14	11	12	17	26	35	43
28-Jun	Tu		46	42	32	16	-5	-27	-46	-59	-63	-56	-41	-22	-1	16	28	32	31	25	19	14	14	20	29	39
29-Jun	W		47	50	45	32	12	-12	-37	-58	-71	-71	-61	-41	-17	7	26	37	40	36	28	19	14	15	22	33
30-Jun	Th		45	54	55	48	31	6	-22	-50	-71	-80	-77	-61	-37	-9	16	35	44	44	37	26	17	12	15	25

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Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Jul	F	New Moon	38	52	60	60	48	27	-2	-33	-62	-81	-86	-78	-57	-29	1	26	43	49	45	34	22	12	9	15
2-Jul	Sa		28	44	58	65	62	46	21	-12	-45	-71	-87	-88	-74	-48	-17	13	36	48	50	41	28	14	6	6
3-Jul	Su		15	30	48	62	67	60	41	12	-22	-54	-77	-87	-82	-63	-35	-3	24	43	51	47	35	19	5	-1
4-Jul	M		2	14	32	50	63	65	54	33	3	-30	-59	-77	-82	-71	-48	-18	11	35	48	50	41	25	9	-4
5-Jul	Tu		-8	-2	13	31	48	58	58	46	23	-6	-35	-58	-70	-69	-54	-29	0	25	43	51	46	33	15	-2
6-Jul	W		-13	-15	-7	9	27	42	50	48	35	14	-11	-34	-51	-57	-51	-33	-9	17	37	49	50	41	24	5
7-Jul	Th		-11	-21	-21	-13	2	18	31	38	36	25	8	-11	-28	-39	-40	-30	-12	10	31	46	52	48	35	16
8-Jul	F	First Quarter	-3	-19	-28	-28	-21	-8	6	18	25	25	18	7	-6	-17	-22	-20	-9	7	26	42	52	53	45	29
9-Jul	Sa		10	-9	-24	-34	-36	-30	-20	-8	4	13	16	15	10	3	-3	-5	-1	8	22	37	49	55	53	43
10-Jul	Su		27	8	-12	-28	-40	-44	-42	-33	-21	-7	4	13	17	17	15	12	10	13	20	31	43	52	56	53
11-Jul	M		43	27	7	-13	-32	-46	-54	-53	-45	-31	-15	1	14	23	27	24	21	21	26	35	45	54	58	58
12-Jul	Tu		55	45	29	9	-14	-36	-54	-63	-63	-54	-38	-18	3	20	32	37	36	31	26	24	27	35	45	55
13-Jul	W		60	59	50	32	9	-17	-42	-61	-71	-70	-58	-39	-15	9	29	41	44	40	32	24	21	24	33	45
14-Jul	Th		57	64	64	53	34	8	-21	-49	-68	-77	-73	-57	-33	-6	19	38	48	48	40	29	19	15	19	31
15-Jul	F	Full Moon	46	60	69	67	55	33	3	-28	-56	-74	-79	-70	-50	-23	6	31	47	52	47	35	21	10	8	15
16-Jul	Sa		30	48	64	72	68	52	27	-5	-36	-61	-75	-75	-61	-37	-8	20	42	52	52	41	26	10	1	1
17-Jul	Su		12	31	51	66	72	65	45	17	-15	-44	-64	-72	-66	-47	-19	9	34	50	54	47	32	14	-1	-8
18-Jul	M		-3	11	32	52	65	67	56	34	5	-24	-49	-63	-64	-51	-28	0	26	45	54	52	39	21	2	-11
19-Jul	Tu		-14	-6	12	33	51	60	58	44	21	-6	-31	-49	-56	-49	-32	-7	19	40	53	54	45	28	9	-8
20-Jul	W		-18	-18	-6	12	31	46	52	47	31	9	-14	-33	-44	-43	-31	-11	13	34	49	55	50	36	17	-2
21-Jul	Th		-17	-23	-19	-7	10	27	38	41	34	19	0	-18	-30	-33	-27	-12	8	29	45	54	53	42	26	7
22-Jul	F		-11	-22	-26	-20	-8	7	20	29	30	23	10	-4	-15	-21	-19	-9	6	24	40	50	53	47	34	17
23-Jul	Sa	Last Quarter	-1	-16	-25	-27	-22	-12	0	12	19	20	15	7	-1	-7	-8	-4	7	20	34	45	51	50	41	27
24-Jul	Su		11	-6	-19	-28	-30	-27	-18	-7	3	11	14	13	10	6	4	5	10	19	29	39	47	50	46	37
25-Jul	M		23	8	-8	-21	-31	-35	-33	-26	-16	-4	6	13	16	17	17	16	17	20	26	33	41	47	48	44
26-Jul	Tu		35	23	7	-9	-25	-37	-43	-42	-35	-23	-9	5	16	24	27	27	26	25	25	28	34	41	46	48
27-Jul	W		46	38	25	7	-12	-31	-46	-53	-52	-43	-27	-9	9	24	33	37	36	32	28	26	27	33	41	48
28-Jul	Th		52	51	43	28	7	-17	-39	-56	-64	-61	-48	-28	-4	17	34	43	45	40	33	25	22	24	32	42
29-Jul	F		52	59	58	48	29	3	-25	-50	-67	-73	-66	-48	-22	5	28	44	51	48	39	28	19	16	20	31
30-Jul	Sa		45	59	66	64	51	28	-3	-34	-60	-76	-78	-65	-41	-12	17	40	53	55	47	33	19	9	8	16
31-Jul	Su	New Moon	31	50	65	73	68	51	23	-11	-43	-68	-80	-76	-57	-29	3	32	51	58	54	40	22	6	-2	0

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Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Aug	M	12	32	54	70	75	67	46	16	-19	-50	-70	-76	-66	-42	-10	21	46	59	59	47	28	8	-8	-14	
2-Aug	Tu	-7	10	33	55	69	72	62	38	7	-25	-51	-66	-64	-48	-21	11	38	57	62	55	37	14	-7	-21	
3-Aug	W	-24	-13	7	31	52	64	65	52	29	0	-27	-47	-54	-46	-25	3	31	53	64	61	47	24	-1	-21	
4-Aug	Th	-32	-31	-18	3	26	45	55	53	41	20	-4	-24	-36	-36	-23	-1	25	48	63	66	56	36	11	-13	
5-Aug	F	-31	-39	-35	-21	-2	18	34	42	40	29	14	-3	-15	-20	-15	0	21	43	59	67	63	48	26	2	
6-Aug	Sa	First Quarter	-20	-35	-41	-37	-25	-9	7	21	28	28	21	12	3	-3	-3	5	20	38	54	64	66	58	41	20
7-Aug	Su		-3	-22	-36	-42	-39	-31	-18	-4	8	16	19	18	15	12	11	13	21	33	46	58	64	62	53	37
8-Aug	M		18	-2	-20	-34	-41	-42	-37	-27	-15	-3	8	16	20	23	23	23	25	30	38	48	56	60	58	50
9-Aug	Tu		37	21	2	-16	-31	-42	-47	-45	-36	-23	-9	6	18	27	32	33	31	30	32	37	44	51	56	56
10-Aug	W		51	41	27	8	-12	-31	-45	-53	-51	-42	-27	-9	10	26	37	41	39	34	29	27	30	37	46	53
11-Aug	Th		57	56	48	32	12	-12	-34	-51	-58	-56	-44	-25	-2	20	37	46	47	40	31	22	18	21	30	43
12-Aug	F		54	62	62	53	35	11	-16	-40	-57	-62	-56	-39	-16	10	33	48	53	48	36	22	11	8	13	26
13-Aug	Sa		43	58	67	67	55	34	6	-23	-47	-61	-62	-50	-28	-1	25	46	56	54	43	27	10	-1	-2	8
14-Aug	Su	Full Moon	25	46	63	72	68	52	27	-3	-31	-52	-61	-55	-38	-12	17	41	56	59	51	34	13	-4	-12	-9
15-Aug	M		6	28	50	67	72	64	44	17	-13	-38	-53	-55	-43	-20	8	35	54	62	57	41	20	-1	-17	-21
16-Aug	Tu		-12	8	32	54	67	68	56	33	5	-22	-41	-49	-43	-24	2	28	50	62	61	49	28	4	-16	-27
17-Aug	W		-25	-11	11	35	54	63	59	44	20	-6	-27	-39	-38	-25	-3	22	45	60	63	55	36	12	-10	-27
18-Aug	Th		-33	-26	-8	15	37	51	56	48	31	9	-12	-26	-30	-23	-5	18	40	56	63	59	44	21	-2	-22
19-Aug	F		-34	-34	-23	-4	17	35	45	46	36	19	1	-13	-20	-17	-5	14	35	52	61	61	50	30	8	-14
20-Aug	Sa		-29	-36	-32	-20	-2	16	30	37	35	25	12	-1	-8	-9	-2	12	30	46	57	60	54	39	18	-2
21-Aug	Su		-20	-32	-35	-30	-18	-3	12	23	27	25	18	10	3	1	4	13	26	40	51	57	55	45	29	10
22-Aug	M	Last Quarter	-7	-22	-31	-33	-29	-19	-7	5	14	19	19	17	13	12	12	17	25	35	44	51	53	48	38	24
23-Aug	Tu		8	-8	-20	-29	-33	-31	-25	-15	-3	7	14	18	21	21	22	23	26	31	37	44	48	48	44	36
24-Aug	W		24	10	-5	-19	-30	-36	-38	-33	-23	-11	2	14	23	29	31	32	31	31	32	35	40	44	46	44
25-Aug	Th		39	29	15	-1	-18	-33	-44	-47	-42	-30	-14	3	19	32	39	40	38	33	29	28	30	35	41	47
26-Aug	F		49	46	37	21	1	-21	-41	-53	-56	-49	-33	-12	10	29	43	48	46	38	29	21	19	22	30	41
27-Aug	Sa		51	57	56	45	25	0	-27	-49	-62	-62	-51	-30	-4	22	42	53	53	45	32	18	9	7	13	27
28-Aug	Su		44	59	67	64	50	26	-4	-34	-56	-66	-62	-45	-19	11	37	54	59	53	38	19	2	-7	-6	6
29-Aug	M	New Moon	26	48	66	74	69	51	23	-10	-39	-59	-65	-54	-31	-1	29	52	63	61	46	24	2	-16	-23	-17
30-Aug	Tu		1	27	52	71	77	69	48	17	-15	-41	-56	-55	-38	-10	21	48	65	67	56	34	7	-18	-34	-36
31-Aug	W		-25	-1	27	53	70	74	64	41	11	-17	-38	-45	-37	-16	14	42	63	72	65	46	18	-11	-35	-47

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Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Sep	Th	-45	-29	-3	26	51	65	66	54	32	7	-16	-29	-29	-15	9	37	60	73	73	58	33	2	-26	-47	
2-Sep	F	-55	-49	-30	-4	23	44	55	54	43	24	5	-10	-16	-10	8	31	55	71	76	68	47	19	-10	-36	
3-Sep	Sa	-52	-56	-47	-29	-5	17	34	42	41	32	19	7	-1	0	10	28	48	65	74	73	59	36	9	-17	
4-Sep	Su	-38	-51	-52	-43	-28	-9	9	22	29	29	24	18	12	10	14	25	40	56	67	71	65	50	28	5	
5-Sep	M	First Quarter	-17	-34	-44	-46	-40	-28	-14	0	11	19	22	22	21	20	21	25	34	45	55	62	63	56	43	25
6-Sep	Tu		7	-11	-26	-36	-40	-38	-31	-20	-8	3	13	20	25	28	28	28	30	35	42	48	53	54	49	40
7-Sep	W		28	13	-2	-17	-29	-37	-39	-35	-26	-13	1	14	25	32	35	34	31	29	29	32	38	43	46	46
8-Sep	Th		43	34	22	6	-11	-27	-38	-42	-38	-28	-13	4	21	34	41	41	36	28	21	18	20	27	35	43
9-Sep	F		49	49	42	29	10	-10	-29	-41	-45	-39	-26	-6	14	33	45	48	43	32	19	9	5	8	18	32
10-Sep	Sa		45	54	56	48	32	10	-13	-33	-45	-46	-36	-17	6	29	46	54	51	39	23	6	-6	-8	-1	15
11-Sep	Su		34	51	61	61	50	30	5	-19	-38	-46	-41	-26	-3	22	44	57	58	48	30	8	-10	-20	-18	-5
12-Sep	M	Full Moon	16	39	57	66	62	47	24	-3	-26	-40	-42	-31	-10	15	40	57	63	56	38	15	-9	-26	-31	-23
13-Sep	Tu		-4	21	46	63	67	59	40	14	-11	-29	-38	-33	-15	9	34	55	65	62	47	23	-3	-25	-38	-38
14-Sep	W		-23	1	29	52	65	64	51	30	5	-16	-29	-30	-18	4	29	51	64	66	54	32	5	-21	-39	-46
15-Sep	Th		-38	-18	9	35	54	62	57	41	19	-3	-18	-24	-17	0	24	46	62	67	60	41	15	-13	-35	-48
16-Sep	F		-48	-34	-11	16	39	53	56	47	30	10	-6	-15	-13	-1	19	40	58	66	63	48	25	-2	-27	-45
17-Sep	Sa		-51	-44	-27	-3	21	39	49	47	36	20	5	-5	-8	0	15	34	52	63	64	54	34	9	-16	-36
18-Sep	Su		-48	-48	-38	-19	2	22	36	41	37	27	14	5	0	3	14	29	45	57	61	56	42	20	-3	-24
19-Sep	M		-39	-46	-43	-32	-15	3	19	29	32	28	21	14	9	9	15	25	38	50	56	55	47	31	11	-9
20-Sep	Tu	Last Quarter	-26	-37	-41	-38	-28	-14	0	13	21	24	23	20	18	17	19	24	33	42	48	51	48	38	23	7
21-Sep	W		-9	-23	-32	-37	-35	-28	-18	-6	6	15	21	24	25	25	26	30	34	39	43	44	41	33	23	
22-Sep	Th		10	-4	-17	-28	-35	-37	-33	-24	-12	1	13	22	29	32	33	31	29	28	29	32	35	37	37	34
23-Sep	F		28	18	4	-11	-25	-36	-41	-39	-30	-16	0	16	30	38	40	38	32	25	20	18	21	26	33	39
24-Sep	Sa		41	38	28	13	-7	-25	-40	-47	-44	-32	-14	7	26	40	47	46	37	25	13	5	4	9	19	33
25-Sep	Su		44	51	49	38	19	-5	-27	-44	-50	-44	-28	-5	19	39	52	54	45	30	11	-4	-13	-13	-2	16
26-Sep	M		36	53	62	59	45	22	-5	-29	-45	-48	-38	-16	10	35	54	61	55	38	15	-8	-26	-33	-27	-10
27-Sep	Tu	New Moon	15	40	61	70	65	48	22	-6	-29	-42	-39	-24	2	30	53	66	65	50	25	-4	-30	-47	-50	-38
28-Sep	W		-14	16	45	66	73	66	46	20	-7	-26	-33	-25	-4	23	50	68	73	62	39	8	-24	-50	-64	-61
29-Sep	Th		-43	-14	18	47	66	71	61	41	17	-6	-19	-19	-6	18	45	66	77	73	55	25	-9	-42	-65	-73
30-Sep	F		-66	-43	-13	19	46	61	63	53	35	14	-2	-9	-3	15	38	61	77	80	68	43	10	-24	-53	-72

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## Hourly Astronomical Tide Level at Shiogama port, Miyagi Pref. in 2011 (unit: centimeter) Issued by JMA

Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Oct	Sa	-75	-63	-39	-10	19	41	53	53	43	28	13	3	3	13	32	53	71	80	75	58	30	-2	-33	-57	
2-Oct	Su	-70	-69	-56	-33	-8	16	33	42	41	34	23	14	10	14	26	43	61	72	75	66	46	19	-9	-35	
3-Oct	M	-53	-62	-59	-47	-28	-8	11	25	31	32	28	22	17	17	22	33	47	59	66	65	54	35	13	-10	
4-Oct	Tu	First Quarter	-30	-44	-50	-48	-38	-25	-9	6	17	24	26	26	24	22	22	26	34	43	51	55	53	43	29	12
5-Oct	W		-5	-21	-32	-38	-38	-33	-23	-11	2	13	21	27	29	28	25	24	24	28	33	39	42	41	36	27
6-Oct	Th		16	3	-10	-22	-30	-33	-30	-23	-11	2	14	25	32	34	32	26	20	17	16	19	24	30	33	33
7-Oct	F		30	23	12	-1	-15	-25	-30	-29	-22	-9	6	21	33	40	40	33	23	12	4	1	4	12	22	31
8-Oct	Sa		36	37	31	19	4	-12	-24	-30	-28	-18	-3	15	32	43	47	42	30	14	-1	-12	-14	-8	4	19
9-Oct	Su		33	43	44	37	23	5	-12	-25	-30	-24	-11	8	28	44	53	51	40	21	0	-18	-28	-27	-16	2
10-Oct	M		23	40	50	50	40	23	3	-15	-26	-26	-17	1	22	42	55	58	49	30	7	-17	-35	-41	-35	-18
11-Oct	Tu		6	30	48	57	53	39	19	-1	-17	-24	-19	-5	16	38	55	62	57	40	16	-12	-35	-50	-50	-37
12-Oct	W	Full Moon	-13	14	39	55	59	51	34	14	-5	-17	-18	-8	11	33	52	63	62	49	26	-3	-31	-51	-60	-53
13-Oct	Th		-33	-5	24	47	59	58	46	27	8	-8	-14	-9	6	27	48	62	66	57	36	8	-22	-47	-62	-63
14-Oct	F		-49	-24	6	33	52	58	53	38	20	3	-7	-7	3	22	42	59	66	62	45	19	-11	-39	-59	-67
15-Oct	Sa		-61	-41	-13	15	39	52	54	45	30	13	1	-3	2	17	36	53	64	64	52	30	2	-27	-51	-65
16-Oct	Su		-66	-53	-30	-3	22	40	49	46	36	22	9	2	3	13	29	46	59	63	57	40	15	-13	-38	-57
17-Oct	M		-64	-59	-44	-21	3	24	38	42	38	28	17	9	7	12	23	38	51	58	57	46	26	2	-23	-44
18-Oct	Tu		-56	-59	-51	-35	-14	6	23	33	35	31	24	16	12	13	20	30	42	51	53	48	35	15	-7	-27
19-Oct	W		-43	-51	-51	-43	-29	-12	5	19	27	29	27	23	19	17	19	25	32	40	45	45	38	26	9	-8
20-Oct	Th	Last Quarter	-25	-37	-44	-45	-38	-27	-12	3	15	24	28	28	26	23	21	21	24	28	33	35	35	30	21	10
21-Oct	F		-4	-17	-29	-37	-39	-36	-26	-13	1	14	24	31	32	30	26	21	17	16	17	21	24	27	27	23
22-Oct	Sa		16	6	-7	-21	-31	-36	-35	-26	-13	3	18	30	37	38	33	25	15	6	2	2	6	14	22	28
23-Oct	Su		30	27	17	3	-13	-26	-34	-33	-24	-9	9	27	39	45	42	32	17	2	-11	-18	-17	-8	6	21
24-Oct	M		34	41	39	29	12	-7	-22	-31	-29	-18	1	21	39	51	52	43	25	4	-17	-33	-39	-34	-19	2
25-Oct	Tu		24	42	52	50	38	19	-2	-18	-25	-21	-6	15	37	54	60	55	38	13	-15	-39	-55	-59	-48	-26
26-Oct	W		2	30	51	60	57	43	22	1	-13	-18	-9	9	32	53	66	67	53	29	-3	-35	-61	-75	-73	-56
27-Oct	Th	New Moon	-28	5	35	56	64	59	44	23	4	-8	-7	5	26	50	68	75	68	47	16	-20	-53	-77	-87	-80
28-Oct	F		-57	-25	9	39	58	63	57	41	22	6	-1	4	21	43	64	77	78	64	37	2	-35	-67	-87	-91
29-Oct	Sa		-79	-53	-20	13	39	55	58	50	36	20	8	6	16	34	55	73	80	75	55	25	-11	-46	-73	-88
30-Oct	Su		-87	-71	-45	-14	15	38	49	50	42	29	17	10	13	25	43	62	74	77	67	44	13	-20	-50	-72
31-Oct	M		-81	-77	-60	-35	-8	16	34	42	41	34	24	16	12	17	30	46	61	69	68	55	32	4	-24	-49

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## Hourly Astronomical Tide Level at Shiogama port, Miyagi Pref. in 2011 (unit: centimeter) Issued by JMA

Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Nov	Tu	-65	-70	-63	-47	-26	-3	16	30	35	34	29	21	15	14	19	30	43	54	59	55	42	22	-1	-24	
2-Nov	W	-42	-53	-55	-49	-35	-17	1	16	26	31	30	26	20	15	13	17	25	34	42	45	41	30	15	-2	
3-Nov	Th	First Quarter	-19	-32	-40	-42	-36	-25	-11	4	17	26	30	30	26	20	14	10	11	15	21	27	30	28	22	13
4-Nov	F		1	-11	-21	-28	-30	-27	-18	-6	7	20	29	33	33	28	19	10	3	0	1	6	12	17	20	20
5-Nov	Sa		15	8	-2	-11	-19	-22	-20	-12	-1	13	25	34	39	37	28	16	3	-8	-15	-15	-9	0	10	18
6-Nov	Su		22	22	16	6	-4	-12	-17	-15	-7	5	20	33	42	44	38	26	9	-9	-23	-31	-29	-20	-7	9
7-Nov	M		21	29	29	23	13	1	-9	-13	-10	-1	14	29	42	49	47	36	18	-3	-24	-40	-45	-40	-26	-7
8-Nov	Tu		13	29	37	37	29	16	3	-7	-10	-5	8	24	40	51	54	46	29	6	-20	-42	-55	-57	-46	-26
9-Nov	W		-1	22	38	45	42	31	16	3	-6	-6	3	18	35	50	57	54	40	17	-10	-38	-58	-67	-63	-45
10-Nov	Th		-19	8	32	46	50	43	30	14	2	-4	0	13	30	47	58	60	50	29	2	-28	-55	-71	-74	-62
11-Nov	F	Full Moon	-39	-9	19	41	52	51	41	26	11	1	0	8	23	41	56	63	58	41	15	-16	-46	-69	-79	-75
12-Nov	Sa		-56	-28	2	29	47	53	48	36	20	8	2	5	17	34	51	62	62	51	28	-1	-33	-60	-77	-81
13-Nov	Su		-70	-46	-17	13	36	49	50	42	29	15	6	4	12	27	44	57	63	57	40	14	-17	-47	-69	-80
14-Nov	M		-77	-61	-35	-6	20	39	47	45	35	22	11	6	9	19	35	50	59	59	48	27	-1	-30	-56	-73
15-Nov	Tu		-77	-69	-50	-24	3	25	38	43	38	28	17	9	8	13	25	39	51	56	52	37	14	-12	-39	-59
16-Nov	W		-71	-71	-59	-39	-15	8	26	36	38	32	23	15	9	10	17	28	39	47	49	41	26	4	-20	-41
17-Nov	Th		-57	-64	-61	-48	-29	-8	12	27	34	34	29	21	13	9	10	16	25	34	39	38	31	17	-1	-21
18-Nov	F		-38	-50	-55	-50	-38	-21	-2	15	27	33	32	27	20	12	7	7	10	17	23	27	27	22	12	-1
19-Nov	Sa	Last Quarter	-16	-30	-40	-43	-39	-29	-14	3	18	29	34	33	27	18	9	2	-2	-1	3	8	14	18	18	13
20-Nov	Su		5	-6	-18	-27	-31	-29	-21	-7	9	24	34	38	36	28	15	2	-9	-17	-19	-15	-7	3	12	18
21-Nov	M		19	15	6	-5	-15	-20	-20	-12	1	17	32	41	44	39	26	9	-9	-25	-36	-39	-34	-22	-6	10
22-Nov	Tu		23	29	27	19	8	-3	-11	-11	-3	11	27	42	50	50	40	22	0	-24	-44	-57	-59	-50	-32	-10
23-Nov	W		12	30	39	39	31	18	5	-3	-3	6	22	39	53	59	55	40	16	-13	-41	-64	-76	-75	-61	-38
24-Nov	Th		-9	18	38	48	47	38	24	10	3	5	16	33	51	64	67	57	36	7	-26	-58	-81	-91	-85	-66
25-Nov	F	New Moon	-37	-5	24	44	53	51	40	25	13	7	12	26	44	62	72	71	57	30	-4	-40	-71	-93	-98	-88
26-Nov	Sa		-65	-33	1	29	48	55	50	38	23	12	10	17	34	53	69	77	71	52	22	-14	-51	-80	-97	-99
27-Nov	Su		-84	-57	-24	8	34	49	52	45	33	19	10	11	22	39	58	73	76	66	44	12	-24	-58	-83	-95
28-Nov	M		-92	-74	-46	-14	15	36	47	47	38	25	13	7	11	24	42	60	71	70	57	33	1	-32	-61	-81
29-Nov	Tu		-87	-79	-59	-32	-4	21	37	43	40	30	18	8	4	10	24	41	56	63	60	45	21	-8	-36	-60
30-Nov	W		-73	-74	-63	-43	-18	6	25	37	39	33	23	11	3	1	8	21	35	47	51	46	31	10	-14	-37

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## Hourly Astronomical Tide Level at Shiogama port, Miyagi Pref. in 2011 (unit: centimeter) Issued by JMA

Date	Moon	Time																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1-Dec	Th		-54	-61	-58	-46	-27	-5	15	29	36	35	28	18	7	-1	-2	3	14	25	34	37	31	19	1	-17
2-Dec	F	First Quarter	-33	-44	-47	-42	-29	-12	6	21	32	36	33	25	14	3	-5	-8	-4	4	12	19	22	18	10	-2
3-Dec	Sa		-15	-26	-32	-33	-27	-16	-1	14	27	35	36	32	23	11	-1	-11	-15	-15	-9	-2	5	10	10	6
4-Dec	Su		-1	-9	-16	-20	-20	-14	-5	8	21	31	37	37	32	21	8	-7	-19	-26	-27	-23	-15	-6	2	7
5-Dec	M		8	5	0	-5	-9	-9	-5	3	14	26	35	40	39	32	19	2	-15	-30	-39	-41	-36	-25	-11	1
6-Dec	Tu		10	15	14	10	5	0	-2	1	9	20	31	40	43	40	30	14	-6	-26	-43	-53	-53	-45	-29	-11
7-Dec	W		6	18	24	24	19	12	5	3	6	14	25	37	45	47	41	26	6	-18	-41	-58	-66	-62	-49	-28
8-Dec	Th		-6	14	28	33	31	24	15	7	5	9	19	31	43	50	49	39	20	-5	-32	-56	-72	-75	-67	-47
9-Dec	F		-22	3	24	37	40	35	25	15	7	6	13	25	38	50	54	49	34	10	-19	-47	-70	-82	-81	-66
10-Dec	Sa	Full Moon	-41	-13	14	34	43	43	35	23	12	6	8	17	32	46	56	57	47	26	-2	-34	-62	-82	-89	-81
11-Dec	Su		-60	-32	-1	24	41	46	42	31	18	8	5	10	23	39	53	60	56	41	15	-16	-48	-74	-89	-90
12-Dec	M		-76	-50	-20	10	32	45	46	38	25	12	5	5	14	29	45	57	60	52	32	3	-30	-61	-83	-91
13-Dec	Tu		-86	-66	-38	-7	19	38	45	42	31	18	6	2	6	17	34	49	58	57	44	20	-10	-42	-69	-85
14-Dec	W		-88	-76	-53	-24	4	27	40	43	36	24	10	1	-1	6	20	36	49	54	49	33	8	-22	-50	-72
15-Dec	Th		-82	-79	-63	-39	-11	15	33	41	39	29	16	4	-4	-3	5	19	33	44	46	38	21	-3	-29	-52
16-Dec	F		-68	-73	-65	-47	-23	2	23	36	40	34	23	9	-3	-9	-7	2	14	26	34	34	27	11	-9	-30
17-Dec	Sa		-48	-58	-59	-49	-31	-8	13	30	38	38	30	16	2	-9	-15	-14	-6	4	14	21	22	17	5	-10
18-Dec	Su	Last Quarter	-25	-38	-44	-42	-31	-14	5	23	35	40	36	26	11	-4	-16	-23	-24	-19	-10	-1	7	11	10	4
19-Dec	M		-5	-15	-23	-27	-24	-15	0	16	31	40	41	35	23	7	-10	-24	-34	-37	-35	-27	-16	-6	3	8
20-Dec	Tu		8	5	-2	-7	-10	-9	-1	11	25	37	44	44	36	22	4	-16	-33	-47	-53	-52	-44	-30	-15	0
21-Dec	W		10	16	17	13	7	3	3	9	19	32	43	49	48	39	23	1	-22	-44	-61	-70	-68	-57	-40	-19
22-Dec	Th		1	17	26	28	25	18	12	10	15	25	37	49	55	53	42	23	-2	-30	-56	-75	-84	-81	-67	-44
23-Dec	F		-18	6	25	36	37	32	23	15	13	17	28	42	54	61	58	45	22	-7	-39	-67	-87	-95	-88	-69
24-Dec	Sa		-43	-13	14	33	43	42	34	23	14	12	18	31	47	60	67	62	46	19	-14	-48	-77	-96	-100	-89
25-Dec	Su	New Moon	-66	-35	-4	23	40	46	42	31	18	9	8	17	32	50	65	70	63	43	13	-22	-57	-84	-99	-98
26-Dec	M		-82	-56	-24	7	31	44	45	37	23	9	2	4	15	34	53	66	69	59	36	4	-32	-64	-87	-96
27-Dec	Tu		-90	-70	-41	-9	18	37	45	41	29	13	0	-6	-1	14	34	53	64	64	50	25	-7	-40	-68	-85
28-Dec	W		-87	-75	-52	-23	6	28	41	43	34	19	3	-9	-12	-4	13	33	49	57	53	37	12	-18	-46	-67
29-Dec	Th		-77	-73	-57	-32	-5	19	36	42	38	25	8	-7	-17	-17	-7	10	28	42	46	40	23	-1	-27	-48
30-Dec	F		-62	-65	-55	-36	-12	11	30	40	40	31	16	-1	-15	-22	-20	-10	5	20	30	32	24	9	-11	-31
31-Dec	Sa		-45	-52	-49	-36	-17	5	24	37	41	37	25	9	-8	-20	-26	-24	-15	-2	10	17	18	11	-2	-16

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