

## Hourly Astronomical Tide Level at Miyako port, Iwate 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		32	41	44	38	22	-1	-27	-53	-71	-79	-76	-60	-37	-12	11	27	35	33	26	16	8	4	7	15
2-Jun	Th	New Moon	28	40	47	46	35	15	-12	-40	-65	-81	-84	-75	-55	-29	-3	19	33	36	32	23	13	7	6	11
3-Jun	F		22	35	46	51	45	30	6	-23	-52	-74	-86	-84	-70	-47	-20	6	25	35	36	29	19	10	6	7
4-Jun	Sa		15	28	41	50	51	42	22	-4	-34	-60	-79	-86	-80	-62	-37	-10	14	29	35	33	25	15	7	5
5-Jun	Su		9	19	32	44	50	48	35	13	-14	-41	-65	-79	-81	-71	-51	-26	-1	19	31	34	29	20	11	4
6-Jun	M		4	10	21	33	43	47	41	27	5	-21	-45	-64	-73	-71	-59	-38	-14	8	24	32	31	25	15	6
7-Jun	Tu		1	2	9	19	30	38	40	33	19	-1	-24	-44	-58	-64	-59	-45	-25	-4	15	27	32	29	20	10
8-Jun	W		1	-4	-3	4	13	23	29	30	24	12	-4	-22	-38	-48	-50	-44	-31	-12	6	22	30	32	26	16
9-Jun	Th	First Quarter	5	-5	-10	-10	-6	2	11	18	20	17	9	-3	-16	-28	-35	-35	-29	-16	0	16	28	33	32	24
10-Jun	F		12	-1	-13	-20	-22	-19	-11	-2	6	11	12	9	2	-7	-15	-20	-20	-14	-3	11	24	34	36	32
11-Jun	Sa		22	8	-7	-22	-32	-36	-34	-27	-16	-5	5	11	13	10	5	-2	-6	-7	-2	8	20	32	39	40
12-Jun	Su		34	22	5	-14	-32	-45	-51	-50	-41	-28	-12	2	13	19	20	16	10	5	4	8	17	28	39	45
13-Jun	M		44	36	21	1	-22	-44	-59	-66	-64	-53	-36	-16	3	18	26	28	24	18	12	11	15	23	34	45
14-Jun	Tu		50	49	39	20	-4	-31	-55	-71	-78	-74	-60	-39	-15	7	23	33	34	29	22	16	14	18	27	39
15-Jun	W		50	56	53	40	18	-9	-39	-64	-81	-86	-79	-61	-37	-10	13	29	37	37	30	22	15	14	20	30
16-Jun	Th	Full Moon	44	55	60	55	39	15	-16	-46	-71	-86	-88	-77	-57	-30	-3	20	34	39	36	28	18	12	13	20
17-Jun	F		32	47	58	62	54	36	9	-23	-52	-75	-86	-84	-70	-47	-19	7	26	37	38	33	22	13	8	10
18-Jun	Sa		19	34	49	59	60	50	29	1	-29	-56	-75	-81	-75	-58	-33	-7	16	32	38	36	27	16	7	3
19-Jun	Su		8	19	34	49	57	55	42	20	-7	-35	-57	-71	-72	-62	-42	-18	6	25	35	37	31	20	9	1
20-Jun	M		-1	6	18	33	46	51	47	32	11	-14	-38	-55	-62	-59	-45	-25	-2	18	32	37	34	26	14	2
21-Jun	Tu		-4	-4	4	16	30	40	42	36	21	2	-19	-37	-48	-50	-43	-28	-8	12	27	36	37	31	20	7
22-Jun	W		-3	-8	-7	1	12	23	31	32	25	12	-4	-20	-32	-38	-36	-26	-11	7	23	34	38	35	26	14
23-Jun	Th	Last Quarter	2	-7	-12	-11	-4	5	15	21	21	16	6	-6	-16	-24	-25	-21	-10	3	18	30	37	38	32	22
24-Jun	F		10	-2	-12	-17	-16	-11	-3	5	11	13	10	4	-3	-9	-13	-12	-7	3	15	26	35	39	37	30
25-Jun	Sa		19	6	-7	-18	-24	-24	-20	-12	-4	4	8	9	7	4	1	-1	0	5	13	22	31	37	39	36
26-Jun	Su		28	16	1	-13	-25	-33	-34	-30	-21	-11	0	7	12	13	12	10	9	9	13	19	27	35	39	40
27-Jun	M		36	26	13	-4	-21	-35	-43	-45	-39	-28	-14	0	11	18	22	21	19	16	15	18	23	31	37	42
28-Jun	Tu		42	37	25	9	-11	-31	-46	-55	-55	-46	-32	-14	4	18	26	29	28	24	20	18	21	26	34	41
29-Jun	W		46	45	38	24	3	-20	-42	-58	-66	-63	-50	-31	-9	11	26	34	35	32	26	21	19	22	28	37
30-Jun	Th		46	51	49	39	20	-4	-31	-54	-69	-74	-67	-50	-27	-2	19	33	39	38	32	24	19	18	22	31

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

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

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

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

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

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

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

## Hourly Astronomical Tide Level at Miyako port, Iwate 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	-69	-54	-30	-3	22	38	45	41	31	18	7	3	7	19	37	55	69	72	63	42	14	-16	-44	-62	
2-Oct	Su	-69	-64	-48	-26	-2	18	30	35	32	25	17	11	11	18	31	47	61	69	67	54	32	6	-21	-43	
3-Oct	M	-57	-61	-54	-40	-22	-3	12	22	26	25	22	18	16	19	27	38	50	60	63	57	44	24	2	-19	
4-Oct	Tu	First Quarter	-37	-47	-49	-44	-34	-19	-5	7	15	20	22	22	21	21	24	30	38	46	51	52	47	35	20	3
5-Oct	W		-13	-27	-36	-39	-36	-29	-19	-7	4	13	19	23	25	25	24	25	27	31	36	39	40	37	30	20
6-Oct	Th		8	-5	-17	-26	-31	-32	-27	-19	-8	4	14	23	28	29	28	24	20	19	20	22	26	30	31	29
7-Oct	F		23	15	4	-9	-20	-27	-29	-26	-17	-5	8	21	30	34	33	27	19	11	6	5	9	16	23	29
8-Oct	Sa		32	29	22	10	-4	-17	-26	-28	-24	-13	1	17	30	38	39	33	22	9	-3	-9	-9	-2	9	22
9-Oct	Su		32	37	36	27	13	-3	-17	-26	-27	-19	-6	11	28	40	44	40	28	11	-6	-19	-24	-20	-9	8
10-Oct	M		25	38	43	40	29	12	-5	-19	-25	-22	-11	6	24	39	48	46	36	18	-4	-23	-34	-36	-27	-10
11-Oct	Tu		11	31	44	48	42	28	9	-7	-18	-21	-14	1	20	37	49	52	43	26	2	-21	-39	-47	-43	-28
12-Oct	W	Full Moon	-6	18	38	49	49	40	23	5	-9	-16	-13	-2	15	34	49	55	50	34	11	-15	-38	-53	-55	-44
13-Oct	Th		-24	2	26	44	51	47	35	18	2	-8	-10	-3	12	30	47	56	55	43	21	-6	-32	-52	-61	-57
14-Oct	F		-40	-16	11	33	47	49	42	28	13	0	-5	-1	10	27	44	56	59	50	31	5	-22	-46	-60	-63
15-Oct	Sa		-53	-32	-6	19	37	46	44	35	22	9	2	1	9	23	39	53	59	55	40	17	-10	-35	-54	-63
16-Oct	Su		-59	-45	-22	2	24	38	42	37	28	17	8	6	10	21	35	48	57	57	47	28	4	-22	-43	-57
17-Oct	M		-60	-52	-36	-14	8	25	35	36	31	23	15	11	12	19	30	43	53	56	51	37	16	-7	-29	-46
18-Oct	Tu		-55	-54	-44	-28	-8	10	23	30	30	26	20	16	15	19	27	37	46	51	50	41	26	7	-14	-32
19-Oct	W		-44	-50	-47	-37	-22	-6	9	20	26	27	24	21	19	20	24	31	38	43	45	41	32	18	2	-15
20-Oct	Th	Last Quarter	-29	-39	-43	-41	-33	-21	-6	7	17	23	26	26	24	23	24	26	29	33	36	36	32	25	15	2
21-Oct	F		-11	-23	-32	-37	-37	-31	-21	-8	5	17	24	28	29	27	25	22	21	21	22	24	26	25	22	17
22-Oct	Sa		8	-3	-14	-25	-32	-34	-30	-21	-7	7	20	29	33	33	28	21	14	8	6	7	11	17	22	24
23-Oct	Su		23	18	8	-5	-18	-28	-32	-28	-18	-3	13	27	36	38	34	24	11	-1	-10	-13	-10	-1	10	22
24-Oct	M		30	33	28	17	2	-13	-25	-28	-24	-11	6	24	37	44	42	31	14	-5	-22	-32	-33	-26	-11	7
25-Oct	Tu		25	38	42	38	25	8	-9	-20	-22	-15	0	19	37	48	50	41	23	-1	-25	-44	-54	-52	-38	-17
26-Oct	W		8	30	45	50	44	29	11	-5	-14	-13	-3	15	35	51	58	53	37	11	-19	-46	-65	-71	-64	-45
27-Oct	Th	New Moon	-18	11	35	50	53	45	30	13	-1	-6	-2	12	31	50	63	64	52	28	-3	-36	-64	-80	-82	-70
28-Oct	F		-46	-16	14	37	50	51	43	28	13	4	2	11	27	46	63	70	65	47	18	-17	-50	-75	-88	-85
29-Oct	Sa		-69	-43	-12	17	37	47	47	38	25	14	8	11	22	39	57	70	72	61	38	7	-27	-58	-79	-87
30-Oct	Su		-80	-62	-36	-7	18	34	41	40	32	22	14	13	18	31	47	62	71	68	53	28	-2	-34	-59	-75
31-Oct	M		-79	-70	-51	-27	-2	18	30	35	33	27	20	15	16	23	36	50	61	65	59	42	18	-9	-35	-55

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

## Hourly Astronomical Tide Level at Miyako port, Iwate 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	-66	-66	-57	-40	-19	1	17	27	30	28	24	18	16	18	25	35	46	54	54	47	31	11	-11	-31	
2-Nov	W	-47	-54	-52	-43	-29	-12	4	17	24	27	26	22	18	16	17	22	30	37	42	41	34	22	7	-10	
3-Nov	Th	First Quarter	-25	-36	-40	-39	-31	-20	-6	7	18	25	27	27	23	18	15	13	15	19	24	28	28	24	17	7
4-Nov	F	-5	-16	-24	-29	-28	-22	-13	-1	11	21	27	30	29	24	17	10	5	4	6	10	15	18	18	16	
5-Nov	Sa	10	2	-6	-14	-19	-20	-16	-7	4	16	26	32	34	31	23	12	1	-7	-10	-9	-3	5	12	17	
6-Nov	Su	19	16	10	2	-7	-13	-14	-10	-1	10	23	33	38	37	30	18	3	-11	-22	-25	-22	-13	-1	11	
7-Nov	M	21	25	24	17	8	-2	-9	-10	-5	5	18	31	40	43	38	26	9	-10	-27	-37	-39	-32	-18	-1	
8-Nov	Tu	16	27	32	30	22	11	0	-6	-5	1	13	27	39	46	45	35	18	-5	-27	-44	-52	-49	-36	-17	
9-Nov	W	4	23	35	39	34	24	12	2	-3	0	9	23	37	47	50	44	28	5	-21	-44	-59	-62	-53	-35	
10-Nov	Th	-11	13	31	42	42	35	23	11	2	1	7	19	33	46	53	51	38	16	-11	-38	-59	-69	-67	-52	
11-Nov	F	Full Moon	-29	-2	22	38	45	42	32	20	9	4	6	15	29	44	54	56	47	28	2	-27	-53	-70	-75	-66
12-Nov	Sa	-46	-19	8	30	43	45	39	28	17	9	7	13	25	39	52	58	54	39	15	-14	-42	-64	-76	-74	
13-Nov	Su	-60	-36	-9	17	35	43	42	34	23	14	9	11	20	34	47	57	58	48	28	2	-27	-53	-70	-76	
14-Nov	M	-69	-50	-25	1	23	37	41	38	29	19	13	12	17	28	41	52	57	53	38	16	-11	-38	-59	-71	
15-Nov	Tu	-71	-60	-39	-15	9	27	36	38	33	25	17	13	15	22	33	44	52	53	44	27	4	-21	-44	-60	
16-Nov	W	-67	-63	-49	-29	-6	14	28	35	34	29	22	16	15	18	25	35	43	48	45	34	17	-4	-26	-45	
17-Nov	Th	-56	-59	-53	-39	-20	0	17	28	33	32	27	20	16	15	18	24	31	37	39	35	24	9	-8	-26	
18-Nov	F	-40	-49	-49	-43	-30	-13	5	19	29	32	30	25	19	14	13	14	18	23	27	28	25	17	6	-7	
19-Nov	Sa	Last Quarter	-20	-32	-38	-39	-33	-21	-6	9	22	30	33	30	24	17	10	5	4	5	9	13	17	17	14	8
20-Nov	Su	-1	-11	-20	-26	-28	-23	-13	0	15	27	34	35	31	22	12	1	-8	-12	-12	-8	-1	7	13	16	
21-Nov	M	14	9	1	-8	-15	-18	-14	-5	8	22	33	39	38	31	18	3	-13	-26	-32	-32	-25	-13	0	12	
22-Nov	Tu	21	23	21	13	3	-5	-8	-5	4	17	31	42	46	42	30	12	-10	-31	-46	-53	-51	-40	-22	-3	
23-Nov	W	15	28	33	31	23	12	3	0	3	13	27	41	51	52	44	27	2	-25	-49	-66	-71	-66	-50	-27	
24-Nov	Th	-2	20	35	41	38	29	17	9	7	12	23	38	52	60	57	44	21	-9	-40	-66	-82	-85	-75	-54	
25-Nov	F	New Moon	-27	1	25	40	45	41	31	20	12	12	19	32	48	61	66	60	42	14	-20	-53	-78	-92	-91	-77
26-Nov	Sa	-53	-23	7	29	43	46	40	30	19	14	16	25	40	56	68	69	59	36	5	-30	-62	-85	-95	-90	
27-Nov	Su	-73	-46	-15	12	32	42	43	36	26	17	14	18	30	45	61	70	68	53	28	-4	-38	-67	-86	-91	
28-Nov	M	-83	-63	-35	-7	18	34	40	39	31	21	14	13	19	32	48	61	67	62	45	19	-12	-42	-67	-80	
29-Nov	Tu	-81	-70	-49	-23	3	22	34	37	33	25	16	10	11	19	32	46	56	59	51	34	9	-18	-43	-62	
30-Nov	W	-70	-67	-54	-33	-10	11	26	34	34	29	20	12	7	9	16	28	40	48	48	39	23	1	-21	-41	

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.

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

Date	Day	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		-53	-57	-51	-37	-18	2	19	30	34	32	25	16	8	4	5	12	21	30	35	34	26	13	-4	-21
2-Dec	F	First Quarter	-34	-42	-42	-34	-21	-5	12	25	32	34	30	22	13	4	0	0	4	11	18	22	22	16	6	-5
3-Dec	Sa		-16	-25	-29	-27	-20	-8	6	19	29	34	34	29	20	10	0	-6	-9	-7	-2	5	10	11	10	5
4-Dec	Su		-2	-9	-14	-16	-14	-7	3	14	25	33	36	34	28	18	6	-6	-15	-20	-19	-14	-7	0	6	8
5-Dec	M		8	5	1	-3	-5	-4	2	10	20	30	36	38	35	26	14	-1	-16	-27	-33	-32	-26	-16	-5	5
6-Dec	Tu		12	14	14	10	6	3	4	8	16	25	34	40	40	35	24	8	-11	-28	-41	-46	-44	-34	-20	-4
7-Dec	W		9	19	23	22	18	12	8	8	13	21	30	39	43	42	34	19	-1	-23	-42	-55	-58	-52	-37	-18
8-Dec	Th		1	17	27	31	28	22	15	11	12	17	25	36	44	47	43	31	11	-13	-37	-57	-67	-66	-55	-36
9-Dec	F		-13	9	26	35	36	31	23	16	12	14	21	31	42	50	50	42	25	0	-27	-52	-70	-76	-70	-54
10-Dec	Sa	Full Moon	-30	-4	18	33	40	38	30	22	15	13	17	26	38	49	54	51	38	16	-12	-41	-65	-79	-80	-69
11-Dec	Su		-47	-20	6	27	39	41	36	27	18	13	13	20	31	44	54	57	49	31	4	-26	-54	-74	-84	-79
12-Dec	M		-63	-38	-9	16	33	41	40	33	23	15	11	14	24	37	50	57	55	43	21	-8	-38	-63	-79	-83
13-Dec	Tu		-73	-53	-26	2	24	38	41	37	28	18	11	10	16	28	41	52	56	50	34	9	-19	-47	-69	-79
14-Dec	W		-77	-63	-40	-13	12	30	39	39	32	22	13	8	9	17	30	42	51	51	42	24	-1	-28	-52	-68
15-Dec	Th		-74	-67	-50	-26	-1	21	35	39	36	27	16	7	4	8	17	28	39	45	43	32	13	-9	-33	-52
16-Dec	F		-62	-63	-53	-35	-12	11	28	37	38	31	21	10	2	0	4	12	23	31	35	32	22	6	-13	-32
17-Dec	Sa		-45	-52	-49	-37	-19	1	20	33	38	35	27	15	4	-4	-7	-3	4	12	20	24	21	14	2	-12
18-Dec	Su	Last Quarter	-25	-34	-37	-32	-21	-4	13	28	37	39	33	22	9	-3	-12	-16	-15	-9	-1	6	11	12	9	2
19-Dec	M		-6	-15	-20	-21	-16	-6	8	23	35	40	39	31	19	4	-11	-22	-28	-29	-25	-17	-8	1	6	8
20-Dec	Tu		7	3	-1	-5	-6	-2	7	19	31	40	44	40	31	16	-1	-19	-34	-43	-46	-42	-32	-20	-7	4
21-Dec	W		12	15	15	11	8	7	9	17	27	37	45	48	43	32	14	-7	-28	-47	-59	-62	-57	-45	-29	-10
22-Dec	Th		6	18	24	25	22	17	15	16	23	32	43	50	52	47	33	13	-13	-38	-60	-73	-77	-70	-54	-32
23-Dec	F		-10	10	25	32	33	28	22	18	19	26	36	47	56	58	51	34	10	-19	-48	-71	-85	-86	-76	-56
24-Dec	Sa		-31	-5	17	32	38	36	29	22	18	19	26	38	51	61	62	53	34	6	-26	-57	-80	-92	-90	-76
25-Dec	Su	New Moon	-53	-24	3	24	37	40	35	26	18	14	17	26	40	55	64	64	53	30	0	-34	-64	-85	-93	-87
26-Dec	M		-69	-43	-14	12	31	39	39	31	20	11	8	13	25	41	57	65	63	48	23	-8	-41	-68	-85	-88
27-Dec	Tu		-78	-56	-29	-1	22	35	39	35	24	12	4	3	10	24	41	56	62	57	40	14	-17	-46	-68	-79
28-Dec	W		-77	-63	-39	-12	12	30	38	37	28	16	3	-3	-2	8	23	39	52	55	47	28	3	-24	-48	-64
29-Dec	Th		-69	-61	-44	-20	4	24	36	38	33	21	7	-4	-9	-6	5	20	35	44	44	34	16	-6	-29	-47
30-Dec	F		-56	-54	-43	-24	-2	18	33	39	36	27	13	0	-10	-13	-9	2	15	27	33	31	21	5	-13	-29
31-Dec	Sa		-40	-43	-37	-24	-6	13	29	38	39	33	21	8	-5	-14	-17	-12	-3	7	17	21	18	10	-2	-15

\* Note that tide levels in the calendar are astronomical tide levels. During an intense low pressure system's approaching, tide levels can be higher by a few to tens centimeters than the values in the calendar.