

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

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

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

\* 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 Kuji 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-Sep	Th		-22	-4	20	45	64	71	67	52	32	10	-7	-13	-7	9	31	55	73	79	73	55	30	2	-21	-34
2-Sep	F		-35	-24	-4	20	43	58	63	57	45	28	12	2	3	13	30	52	71	82	80	67	45	18	-8	-28
3-Sep	Sa		-37	-35	-23	-4	18	37	49	52	47	38	26	17	14	19	31	48	66	79	83	76	59	36	10	-13
4-Sep	Su		-29	-35	-31	-20	-4	14	29	38	41	39	34	28	24	26	33	45	59	71	79	78	68	50	29	7
5-Sep	M	First Quarter	-12	-24	-29	-27	-18	-6	8	20	28	32	34	33	32	32	35	42	51	61	69	73	69	59	45	27
6-Sep	Tu		10	-6	-17	-23	-23	-19	-10	1	12	21	28	34	37	38	39	41	45	50	56	61	63	61	54	43
7-Sep	W		30	16	1	-11	-20	-23	-22	-15	-5	7	19	30	38	43	45	43	42	41	43	46	50	53	54	52
8-Sep	Th		46	36	22	7	-8	-20	-26	-26	-20	-8	7	22	36	45	49	48	42	36	32	31	34	40	47	52
9-Sep	F		54	51	42	27	9	-9	-23	-30	-30	-21	-6	12	30	45	53	53	47	36	25	18	17	22	32	44
10-Sep	Sa		54	59	56	46	28	7	-13	-28	-33	-30	-17	2	23	41	54	58	52	40	24	11	4	5	14	29
11-Sep	Su		46	59	64	60	46	25	2	-18	-31	-33	-25	-8	14	36	53	60	58	46	28	9	-4	-9	-3	11
12-Sep	M	Full Moon	31	51	64	67	59	42	19	-4	-22	-30	-27	-14	7	30	50	61	62	52	34	12	-7	-18	-18	-7
13-Sep	Tu		13	36	56	67	67	55	35	12	-9	-22	-24	-15	2	25	46	61	65	58	42	19	-4	-21	-28	-22
14-Sep	W		-5	18	42	60	67	62	48	27	6	-11	-18	-14	0	20	42	60	67	63	49	27	3	-19	-32	-32
15-Sep	Th		-21	0	25	47	61	64	55	39	19	2	-9	-9	0	18	38	57	68	67	56	36	12	-12	-30	-37
16-Sep	F		-31	-15	7	31	50	59	57	46	30	13	1	-3	3	16	34	53	66	69	62	45	22	-2	-23	-35
17-Sep	Sa		-36	-26	-8	15	36	50	54	49	38	23	11	5	7	16	31	48	62	68	65	52	32	9	-12	-28
18-Sep	Su		-35	-32	-19	-1	20	36	46	47	41	31	21	13	12	18	29	43	56	65	65	57	41	21	0	-18
19-Sep	M		-29	-31	-25	-13	4	21	33	40	40	35	28	22	19	22	29	40	51	59	63	59	47	31	13	-5
20-Sep	Tu	Last Quarter	-18	-26	-26	-20	-9	4	18	28	34	34	32	29	27	28	31	38	46	53	58	57	51	40	25	10
21-Sep	W		-4	-15	-21	-23	-19	-10	1	12	22	29	32	34	34	34	36	39	43	47	51	52	50	45	36	24
22-Sep	Th		12	0	-11	-18	-22	-21	-15	-5	7	18	28	35	39	41	41	41	41	41	42	44	45	45	42	37
23-Sep	F		29	18	6	-6	-17	-24	-25	-20	-10	4	18	31	41	46	47	44	40	36	33	33	35	39	43	45
24-Sep	Sa		43	38	27	12	-4	-18	-28	-30	-24	-11	6	24	39	49	52	49	42	32	24	20	20	26	34	44
25-Sep	Su		51	53	48	35	17	-3	-20	-30	-31	-23	-6	15	35	50	57	55	46	32	18	7	3	7	18	33
26-Sep	M		48	60	63	56	41	19	-3	-21	-30	-27	-15	6	29	49	60	62	53	37	17	-2	-12	-14	-5	12
27-Sep	Tu	New Moon	34	54	67	70	62	43	20	-3	-19	-24	-17	0	23	46	63	69	62	46	22	-3	-22	-31	-28	-13
28-Sep	W		10	37	59	72	73	63	43	19	-1	-13	-13	-2	18	43	63	74	72	58	34	5	-22	-40	-45	-37
29-Sep	Th		-17	11	39	62	73	71	59	40	19	3	-3	2	17	39	61	77	80	70	49	19	-12	-38	-52	-53
30-Sep	F		-40	-16	13	41	60	68	65	53	36	19	9	9	18	36	57	75	85	80	64	37	6	-24	-47	-56

\* 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 Kuji 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	-53	-37	-12	15	40	55	61	57	46	33	21	17	21	34	51	69	83	85	75	54	26	-4	-30	-48	
2-Oct	Su	-53	-47	-30	-8	16	36	48	51	48	40	31	25	25	32	45	60	75	82	79	66	44	18	-8	-30	
3-Oct	M	-43	-45	-38	-23	-4	15	31	40	43	41	37	32	29	32	40	51	63	72	75	69	55	36	14	-7	
4-Oct	Tu	First Quarter	-23	-33	-34	-28	-17	-2	13	25	33	37	38	36	34	34	36	42	50	57	63	64	58	47	32	15
5-Oct	W		-1	-14	-22	-24	-21	-13	-2	10	21	30	35	39	39	38	36	36	38	42	47	51	52	49	42	32
6-Oct	Th		20	7	-4	-13	-17	-17	-12	-3	9	20	31	38	43	43	40	35	31	29	30	33	38	42	43	41
7-Oct	F		36	27	16	3	-7	-14	-16	-12	-3	10	24	36	44	48	46	39	29	21	16	15	20	27	36	42
8-Oct	Sa		44	42	34	22	7	-6	-14	-16	-11	0	16	31	44	51	51	45	32	18	6	0	1	9	21	34
9-Oct	Su		45	50	48	39	24	8	-7	-15	-15	-7	7	25	41	52	56	51	38	21	3	-10	-15	-10	3	20
10-Oct	M		38	51	56	52	40	23	5	-8	-14	-10	1	18	37	52	59	57	46	27	5	-15	-26	-27	-17	2
11-Oct	Tu		24	44	57	60	53	38	20	2	-8	-10	-2	12	31	49	60	62	53	34	11	-13	-31	-38	-33	-17
12-Oct	W	Full Moon	6	31	51	61	61	50	34	15	0	-6	-3	9	26	45	59	65	59	43	19	-7	-30	-44	-45	-34
13-Oct	Th		-13	14	39	56	63	58	45	27	11	1	-1	7	22	40	57	66	64	51	29	2	-24	-43	-52	-46
14-Oct	F		-29	-4	23	46	59	60	52	38	21	9	3	7	19	36	53	64	67	58	39	14	-14	-37	-51	-53
15-Oct	Sa		-42	-21	6	31	50	58	55	45	31	17	9	9	17	31	47	61	67	63	48	25	-1	-26	-45	-53
16-Oct	Su		-48	-33	-10	15	37	50	54	49	38	26	16	13	17	28	42	56	65	65	55	36	12	-13	-34	-47
17-Oct	M		-49	-40	-23	0	22	39	48	49	42	33	24	19	19	26	37	50	60	63	58	44	24	2	-20	-36
18-Oct	Tu		-44	-42	-31	-14	6	25	38	44	43	38	31	25	23	27	34	44	53	59	58	49	34	15	-4	-21
19-Oct	W		-33	-37	-34	-23	-8	9	24	35	40	40	36	32	29	29	33	39	46	52	54	50	41	27	11	-4
20-Oct	Th	Last Quarter	-18	-27	-30	-27	-18	-5	9	22	32	37	39	38	36	34	33	35	38	42	45	46	42	35	25	13
21-Oct	F		1	-10	-19	-23	-22	-15	-5	8	21	31	38	42	41	39	36	33	31	31	33	35	37	37	34	28
22-Oct	Sa		20	10	-1	-11	-17	-18	-14	-4	9	23	35	43	46	45	40	33	25	20	18	19	24	29	34	37
23-Oct	Su		36	30	21	8	-4	-13	-16	-12	-2	13	29	42	49	51	46	36	23	11	3	0	4	13	24	36
24-Oct	M		44	46	42	31	16	2	-9	-12	-7	5	22	39	51	57	54	43	26	7	-9	-18	-19	-11	4	23
25-Oct	Tu		40	53	57	52	39	22	6	-5	-6	1	16	35	52	62	63	53	35	11	-13	-31	-39	-36	-22	-1
26-Oct	W		24	46	60	64	58	43	25	9	1	3	13	30	50	65	71	65	48	23	-7	-33	-51	-56	-48	-29
27-Oct	Th	New Moon	-1	27	51	65	67	59	44	26	13	8	13	27	46	64	76	76	63	39	8	-24	-51	-66	-66	-54
28-Oct	F		-30	1	31	54	66	66	57	42	27	17	16	25	40	59	76	82	76	57	29	-5	-38	-62	-73	-69
29-Oct	Sa		-52	-26	6	34	54	63	61	52	38	26	21	24	35	52	69	82	83	71	48	17	-16	-46	-66	-72
30-Oct	Su		-64	-45	-18	11	35	51	57	55	46	35	26	24	30	43	59	74	82	78	63	38	8	-22	-47	-62
31-Oct	M		-64	-54	-35	-10	15	35	47	51	48	40	32	26	27	34	47	61	72	76	69	52	29	2	-23	-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 Kuji 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	-53	-52	-41	-23	-2	19	34	43	45	43	37	30	27	28	35	46	57	65	65	57	42	22	0	-20	
2-Nov	W	-34	-41	-38	-28	-13	5	21	33	40	42	40	35	29	26	27	32	40	48	53	53	46	34	18	2	
3-Nov	Th	First Quarter	-13	-23	-27	-25	-17	-5	10	23	34	40	42	40	35	29	24	23	25	29	35	40	40	37	29	19
4-Nov	F		7	-4	-12	-16	-15	-9	2	14	26	36	41	43	41	35	27	19	15	14	16	21	27	31	31	28
5-Nov	Sa		23	15	6	-2	-7	-7	-3	6	18	30	40	45	46	42	33	21	10	2	-1	2	8	17	25	30
6-Nov	Su		32	29	23	14	5	-1	-2	2	11	23	35	45	49	48	40	27	11	-3	-13	-16	-11	-1	12	25
7-Nov	M		34	38	36	29	19	9	2	1	7	17	30	42	51	53	48	35	17	-3	-19	-29	-29	-21	-6	12
8-Nov	Tu		29	40	45	42	33	21	10	4	5	12	24	38	49	56	54	43	25	3	-20	-36	-43	-39	-25	-5
9-Nov	W		17	36	47	50	45	34	21	10	6	9	19	32	46	56	58	51	35	12	-14	-37	-51	-53	-44	-24
10-Nov	Th		0	25	43	53	52	44	31	18	10	9	15	27	41	54	61	57	44	22	-5	-31	-52	-61	-57	-42
11-Nov	F	Full Moon	-18	9	33	50	55	51	41	27	16	11	13	22	36	50	60	62	53	33	7	-21	-46	-62	-66	-56
12-Nov	Sa		-35	-8	19	41	53	55	48	36	23	15	13	19	30	45	57	63	59	44	21	-8	-35	-56	-67	-64
13-Nov	Su		-49	-25	3	28	46	54	52	42	30	20	15	17	26	39	52	62	63	53	33	7	-21	-45	-62	-66
14-Nov	M		-58	-39	-13	13	35	48	52	47	37	27	19	17	22	33	46	57	62	58	44	22	-5	-30	-51	-61
15-Nov	Tu		-61	-48	-27	-2	22	39	48	49	43	33	25	20	21	28	39	50	58	59	50	34	11	-13	-35	-51
16-Nov	W		-56	-51	-37	-16	7	27	41	47	46	39	31	24	22	25	32	42	50	55	52	42	25	4	-17	-35
17-Nov	Th		-45	-47	-40	-25	-6	14	31	42	45	43	37	30	25	23	26	33	40	46	48	44	34	19	2	-15
18-Nov	F		-29	-36	-36	-28	-15	2	19	34	42	45	42	36	30	24	22	24	28	33	37	39	36	28	17	4
19-Nov	Sa	Last Quarter	-8	-19	-24	-24	-17	-6	9	24	37	44	45	42	36	27	20	16	15	17	21	25	29	29	27	20
20-Nov	Su		12	2	-6	-12	-12	-7	3	16	30	41	47	47	43	34	23	12	4	0	1	5	13	20	26	29
21-Nov	M		28	23	15	6	0	-2	2	11	24	37	47	52	50	42	29	14	-2	-13	-19	-18	-11	1	15	27
22-Nov	Tu		35	37	34	27	17	10	7	10	19	32	45	55	58	53	41	22	1	-19	-33	-39	-36	-25	-7	12
23-Nov	W		30	42	47	45	36	25	17	14	18	28	41	54	63	63	54	36	12	-14	-38	-53	-58	-51	-35	-12
24-Nov	Th		13	35	49	54	51	42	30	22	20	25	36	51	64	70	67	53	30	1	-30	-55	-69	-71	-60	-39
25-Nov	F	New Moon	-11	17	40	54	58	54	43	31	24	24	31	44	59	72	76	68	50	22	-11	-43	-68	-80	-78	-63
26-Nov	Sa		-38	-7	22	44	56	59	52	41	30	24	26	35	50	66	77	78	66	43	12	-22	-53	-75	-83	-77
27-Nov	Su		-59	-31	0	27	47	56	56	48	36	27	23	28	39	54	69	78	76	60	35	3	-30	-58	-76	-80
28-Nov	M		-70	-49	-21	8	32	48	54	51	42	31	23	21	28	40	56	69	75	69	52	26	-5	-35	-58	-71
29-Nov	Tu		-70	-58	-36	-9	17	37	48	50	45	36	25	19	19	27	39	54	65	68	59	41	17	-10	-35	-53
30-Nov	W		-60	-56	-42	-20	4	25	40	47	46	40	30	20	15	17	24	36	48	56	57	48	31	10	-13	-32

\* 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 Kuji 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-Dec	Th		-44	-47	-40	-25	-5	15	32	43	46	43	36	25	16	11	13	19	29	39	45	44	36	22	5	-11
2-Dec	F	First Quarter	-25	-32	-31	-23	-9	8	25	38	45	45	41	32	21	12	7	7	12	19	27	32	32	26	17	5
3-Dec	Sa		-7	-15	-19	-16	-9	4	18	32	42	46	45	39	29	18	8	1	-1	1	7	15	21	23	20	15
4-Dec	Su		9	1	-4	-6	-4	3	13	25	37	44	47	44	37	26	13	1	-8	-13	-11	-5	3	11	17	19
5-Dec	M		18	15	11	6	4	6	11	20	31	40	46	47	43	34	21	6	-9	-21	-26	-24	-16	-5	6	16
6-Dec	Tu		22	25	23	19	15	12	12	17	25	34	43	48	48	42	31	14	-5	-22	-35	-39	-35	-25	-10	6
7-Dec	W		20	29	32	31	26	20	16	16	20	28	37	46	50	48	40	24	4	-18	-37	-49	-51	-44	-28	-9
8-Dec	Th		11	26	36	39	36	29	21	17	17	23	31	41	49	52	48	35	15	-9	-33	-52	-61	-59	-47	-27
9-Dec	F		-4	18	34	42	43	37	28	21	17	19	25	36	46	54	54	45	28	4	-23	-48	-64	-70	-63	-46
10-Dec	Sa	Full Moon	-21	5	27	41	47	44	36	26	19	16	20	29	41	52	57	54	40	18	-10	-37	-60	-73	-74	-61
11-Dec	Su		-39	-12	15	35	46	48	42	32	22	17	17	23	35	47	57	59	51	32	7	-23	-50	-69	-77	-72
12-Dec	M		-55	-29	-1	25	42	49	47	39	28	19	15	18	27	40	53	60	58	45	23	-5	-34	-59	-73	-76
13-Dec	Tu		-65	-44	-16	11	33	46	49	44	34	23	16	15	21	32	45	56	60	54	37	13	-15	-42	-62	-72
14-Dec	W		-69	-54	-30	-3	22	40	49	48	40	29	19	14	15	23	35	48	56	56	47	28	4	-22	-45	-61
15-Dec	Th		-65	-57	-39	-15	11	32	45	49	45	35	24	15	12	15	24	35	46	52	50	38	20	-2	-25	-43
16-Dec	F		-53	-52	-42	-23	0	23	40	48	48	41	30	19	11	9	13	21	31	40	44	41	30	14	-5	-22
17-Dec	Sa		-35	-40	-36	-24	-6	15	33	45	50	46	37	25	13	5	3	7	14	23	31	34	32	24	12	-2
18-Dec	Su	Last Quarter	-15	-23	-24	-19	-7	10	27	42	50	50	44	33	19	7	-2	-5	-3	2	11	18	23	24	20	13
19-Dec	M		5	-3	-8	-8	-2	9	23	37	48	53	50	42	29	14	0	-11	-17	-17	-13	-4	5	13	18	20
20-Dec	Tu		19	15	11	7	7	12	21	33	44	53	55	51	41	26	8	-9	-23	-32	-34	-29	-19	-7	6	17
21-Dec	W		24	27	27	23	20	19	22	29	39	49	56	58	52	40	23	2	-19	-37	-48	-50	-45	-32	-15	2
22-Dec	Th		18	30	36	37	33	28	26	28	34	43	53	60	61	55	41	20	-5	-30	-51	-63	-65	-57	-41	-20
23-Dec	F		3	23	37	44	43	38	32	28	29	35	45	56	64	65	57	41	16	-13	-41	-63	-75	-76	-65	-45
24-Dec	Sa		-19	8	29	43	49	46	38	30	26	27	35	46	59	68	68	59	39	11	-21	-51	-73	-83	-81	-66
25-Dec	Su	New Moon	-41	-12	15	36	48	50	45	35	25	21	24	33	47	61	70	70	57	34	4	-29	-59	-78	-85	-79
26-Dec	M		-60	-32	-2	24	42	50	48	40	28	18	15	20	31	47	63	71	68	52	27	-4	-37	-63	-79	-81
27-Dec	Tu		-70	-47	-19	10	33	46	49	44	32	19	10	9	16	30	47	62	68	62	44	18	-13	-42	-64	-73
28-Dec	W		-70	-55	-30	-2	23	41	48	47	37	23	10	3	4	14	29	46	58	61	52	33	8	-19	-44	-59
29-Dec	Th		-63	-54	-36	-11	14	35	46	48	42	29	14	2	-3	0	11	26	42	51	51	40	22	-1	-23	-41
30-Dec	F		-50	-47	-35	-15	7	28	43	49	46	36	21	7	-4	-7	-3	8	22	34	41	39	28	12	-6	-23
31-Dec	Sa		-34	-37	-30	-16	3	23	39	48	49	42	30	15	1	-8	-11	-6	3	15	25	29	26	18	5	-8

\* 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.