

Hudson River tides

All Changing Hudson Project Unit & Lesson Plans »

Tides in the Hudson

View

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Revisions

Children

Objectives

Students will know how tides affect the Hudson River and be able to describe a two-day pattern of tides in the river.

Lesson Overview

1. Teacher demonstration of salt and fresh water mixing and stratification
2. Students use Hudson river data to determine the impact of tides on the river
3. Students discuss their graphs



When do you think we'll see the highest high tides?

When should we expect the lowest high tides?

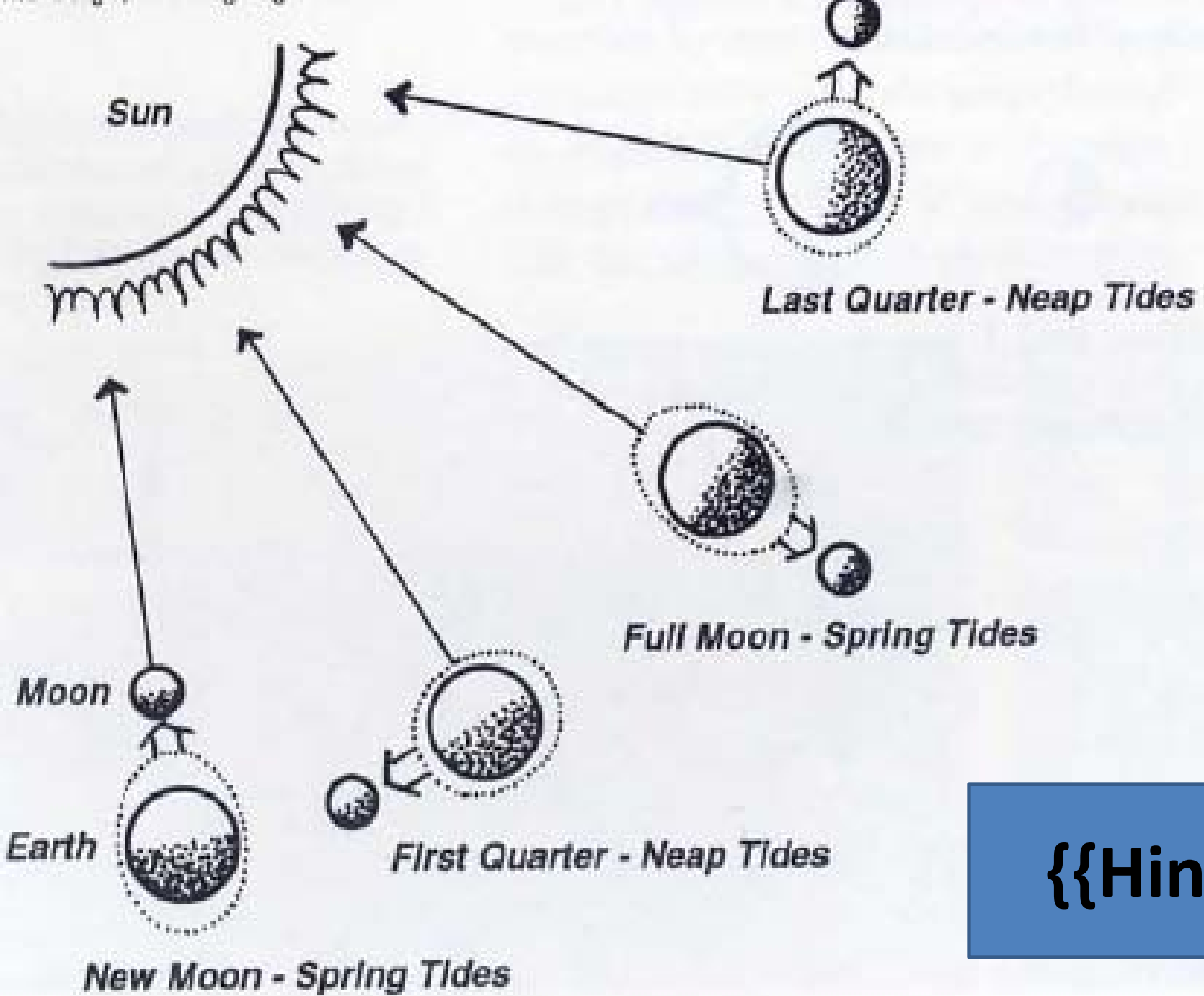
Sept 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Oct 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		





{{Hint}}

Tide tables



THE BATTERY, NY StationId: 8518750

Daily Tide Prediction in Feet

Time Zone: LST/LDT

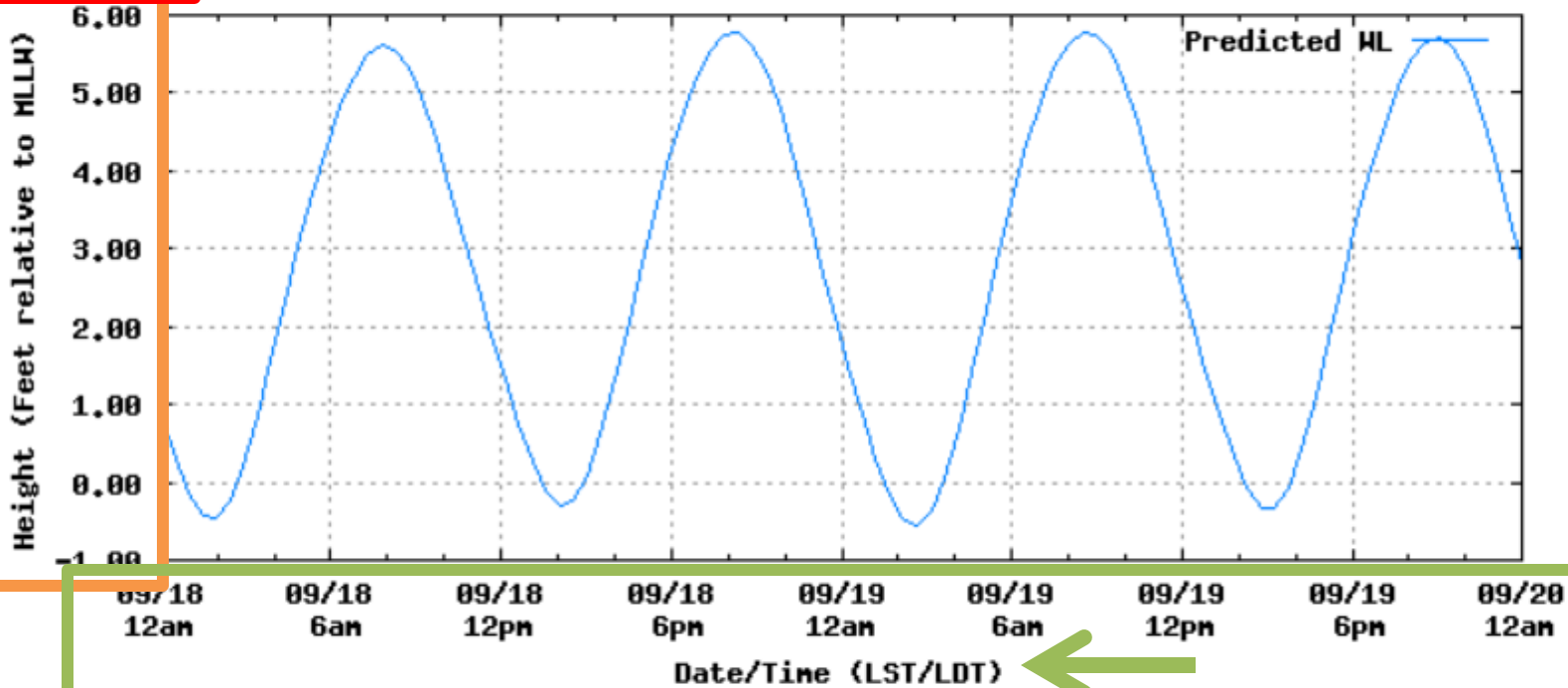
Datum: MLLW

2013/09/18 - 2013/09/19

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Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Begin Date:

Sep 18 2013

Time Range:

Daily

Time Zone:

LST/LDT

Data Units:

Feet

[Show Advanced Options](#)



THE BATTERY, NY StationId: 8518750

Daily Tide Prediction in Feet

Time Zone: LST/LDT

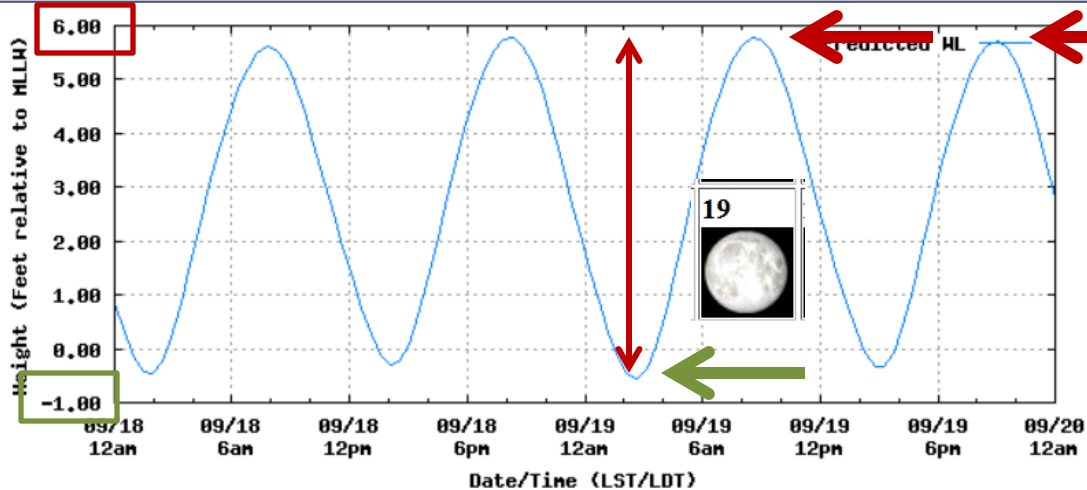
Datum: MLLW

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Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from tables.

Begin Date: Time Range: Time Zone: Data Units: [Show Advanced Options](#)

THE BATTERY, NY StationId: 8518750

Daily Tide Prediction in Feet

Time Zone: LST/LDT

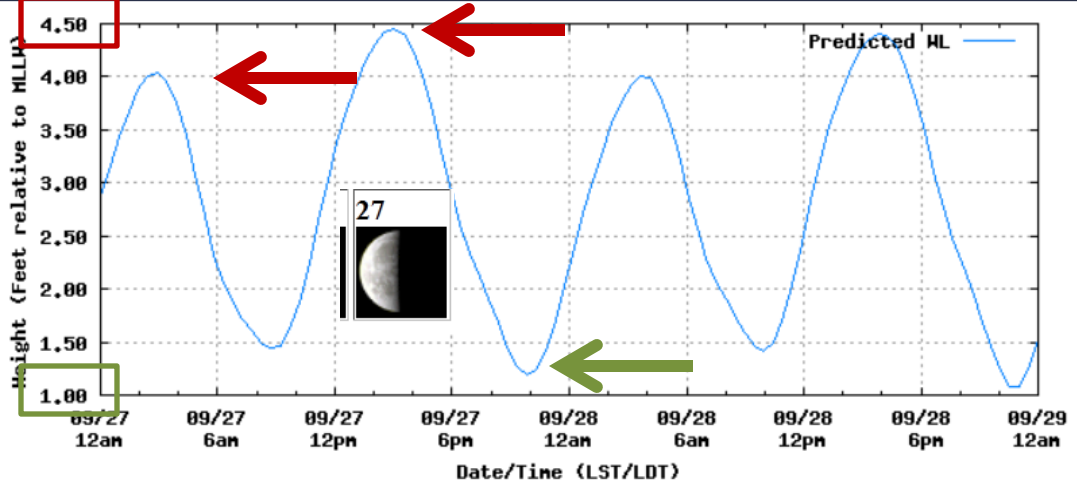
Datum: MLLW

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Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Begin Date: Time Range: Time Zone: Data Units: [Show Advanced Options](#)

Sept 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					



THE BATTERY, NY StationId: 8518750

Daily Tide Prediction in Feet

Time Zone: LST/LDT

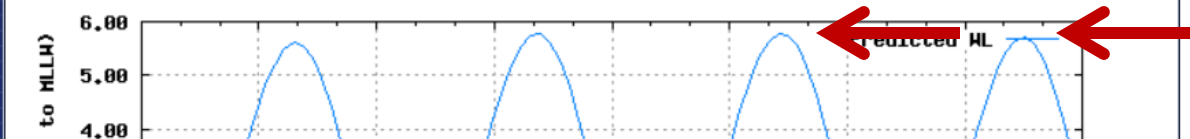
Datum: MLLW

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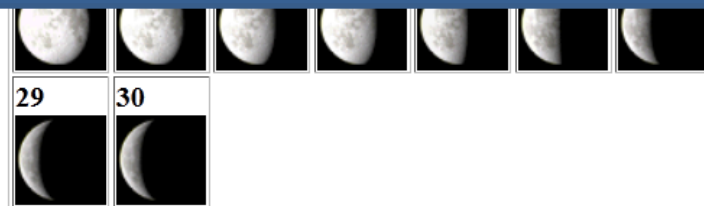
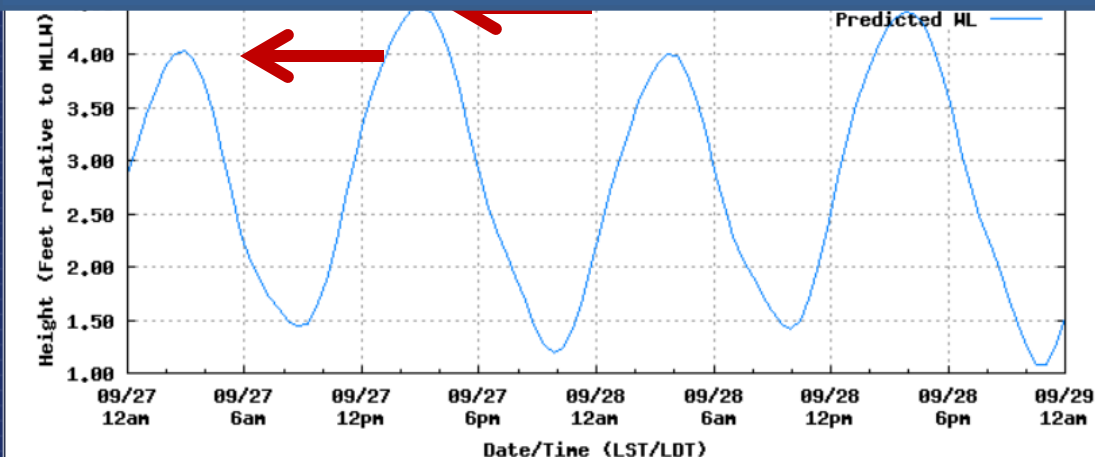
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What about the **new moon**?

How high do you think the **high and low tides** will get?

Make a prediction & write it down!



Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

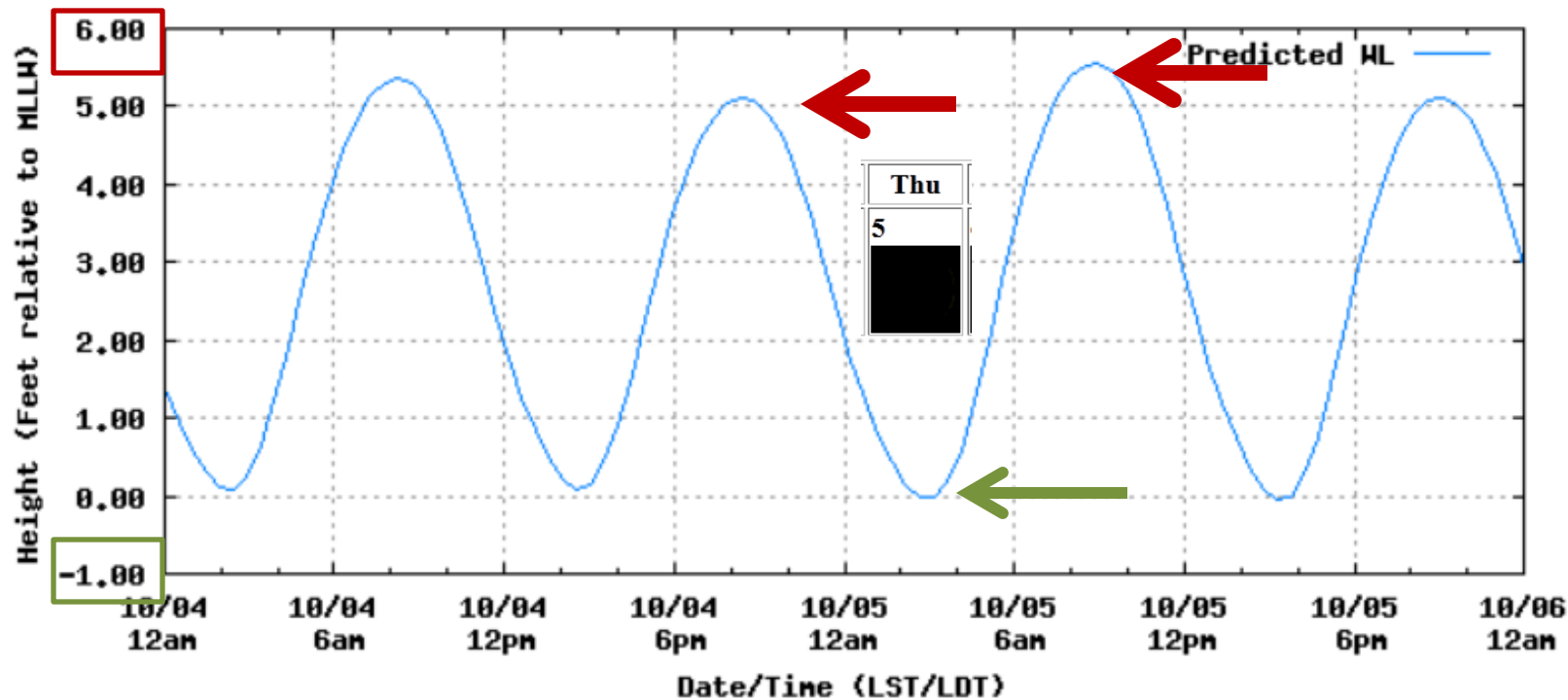
Begin Date: Time Range: Time Zone: Data Units: [Show Advanced Options](#)

THE BATTERY, NY StationId: 8518750

Daily Tide Prediction in Feet
Time Zone: LST/LDT
Datum: MLLW

◀ 2013/10/04 - 2013/10/05 ▶

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Begin Date: Oct 04 2013 Time Range: Daily Time Zone: LST/LDT Data Units: Feet [Show Advanced Options](#)

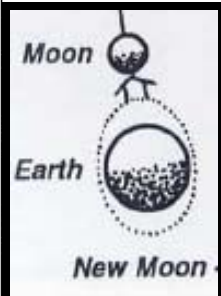


September

October



	Time		Height			Time		Height	
	h	m	ft	cm		h	m	ft	cm
1 Su			0.0	0					
			5.0	152					
			0.1	3					
			5.6	171					
2 M			-0.3	-9					
			5.3	162					
			-0.2	-6					
			5.8	177					
3 Tu	01:35 AM	0.4	12		18 W	01:48 AM	-0.5	-15	
	07:41 AM	4.7	143			07:54 AM	5.6	171	
	01:40 PM	0.6	18			02:11 PM	-0.3	-9	
	07:49 PM	5.1	155			08:13 PM	5.8	177	
4 W	02:15 AM	0.3	9		19 Th	02:35 AM	-0.6	-18	
	08:18 AM	4.9	149			08:40 AM	5.8	177	
	02:24 PM	0.4	12			03:02 PM	-0.4	-12	
	08:22 PM	5.2	158			08:59 PM	5.7	174	
5 Th	02:54 AM	0.1	3		20 F	03:21 AM	-0.5	-15	
	08:52 AM	5.1	155			09:24 AM	5.8	177	
	03:06 PM	0.3	9			03:50 PM	-0.3	-9	
	08:54 PM	5.2	158			09:45 PM	5.5	168	
6 F	03:32 AM	0.0	0		21 Sa	04:04 AM	-0.4	-12	
	09:24 AM	5.2	158			10:09 AM	5.7	174	
	03:48 PM	0.2	6			04:36 PM	-0.1	-3	
	09:26 PM	5.2	158			10:32 PM	5.7	174	
7 Sa	04:08 AM	0.0	0		22 Su	04:46 AM	0.1	3	
	09:57 AM	5.3	162			10:55 AM	5.5	168	
	04:29 PM	0.2	6			05:22 PM	0.1	3	
	10:01 PM	5.1	155			11:22 PM	4.9	149	
8 Su	04:43 AM	0.1	3		23 M	05:27 AM	0.2	6	
	10:33 AM	5.3	162			11:42 AM	5.3	162	
	05:10 PM	0.2	6			06:08 PM	0.4	12	
	10:43 PM	4.9	149						
9 M	05:18 AM	0.2	6		24 Tu	12:13 AM	4.6	140	
	11:16 AM	5.3	162			06:08 AM	0.6	18	
						05:10 AM	5.0	152	
						08:24 AM	0.8	24	
10 Tu			4.4	134				1.0	30
			4.8	146				1.1	34
			4.2	128				1.3	40
			4.6	140				1.2	37
11 W			4.4	134				4.6	140
			4.8	146				4.8	146
			4.2	128				4.4	134
			4.6	140				4.4	134
12 Th	01:35 AM	4.4	134		27 F	02:51 AM	4.0	122	
	07:57 AM	0.7	21			08:52 AM	1.4	43	
	02:07 PM	5.2	158			03:02 PM	4.5	137	
	09:06 PM	0.5	15			09:54 PM	1.2	37	
13 F	02:41 AM	4.4	134		28 Sa	03:46 AM	4.0	122	
	09:17 AM	0.8	24			09:55 AM	1.4	43	
	03:12 PM	5.2	158			03:56 PM	4.4	134	
	10:13 PM	0.5	15			10:46 PM	1.1	34	
14 Sa	03:51 AM	4.5	137		29 Su	04:42 AM	4.1	125	
	10:27 AM	0.6	18			10:50 AM	1.3	40	
	04:21 PM	5.3	162			04:53 PM	4.5	137	
	11:12 PM	0.3	9			11:33 PM	0.9	27	



2013 Battery Park Tide Table

	Time		Height			Time		Height	
	h	m	ft	cm		h	m	ft	cm
1 Tu	12:16 AM	0.7	21		16 W	12:35 AM	-0.3	-9	
	06:24 AM	4.5	137			06:47 AM	5.4	165	
	12:26 PM	0.8	24			01:04 PM	-0.1	-3	
	06:33 PM	4.8	146			07:07 PM	5.3	162	
2 W	12:57 AM	0.4	12		17 Th	01:23 AM	-0.4	-12	
	07:06 AM	4.8	146			07:35 AM	5.6	171	
	01:11 PM	0.5	15			01:54 PM	-0.2	-6	
	07:13 PM	4.9	149			07:54 PM	5.3	162	
3 Th	01:37 AM	0.2	6		18 F	02:09 AM	-0.4	-12	
	07:42 AM	5.1	155			08:18 AM	5.7	174	
	01:56 PM	0.3	9			02:43 PM	-0.3	-9	
	07:49 PM	5.1	155			08:38 PM	5.3	162	
4 F	02:17 AM	0.1	3		19 Sa	02:57 AM	0.0	0	
	08:16 AM	5.4	165			08:49 AM	5.6	171	
	02:41 PM	0.1	3			03:25 PM	-0.1	-3	
	08:25 PM	5.1	155			09:01 PM	5.1	155	
5 Sa	03:37 AM	-0.1	-3		20 Su	03:37 AM	-0.1	-3	
	09:25 AM	5.7	174			09:25 AM	5.7	174	
	04:09 PM	-0.1	-3			04:09 PM	-0.1	-3	
	09:41 PM	5.0	152			09:41 PM	5.0	152	
6 Su	04:17 AM	-0.1	-3		21 M	04:17 AM	-0.1	-3	
	10:05 AM	5.7	174			10:05 AM	5.7	174	
	04:54 PM	-0.1	-3			04:54 PM	-0.1	-3	
	10:28 PM	4.9	149			10:28 PM	4.9	149	
7 M	04:58 AM	0.0	0		22 Tu	05:34 AM	0.7	21	
	10:53 AM	5.6	171			11:50 AM	4.9	149	
	05:42 PM	0.0	0			06:24 PM	0.6	18	
	11:24 PM	4.7	143						
8 Tu	05:44 AM	0.2	6		23 W	12:36 AM	4.2	128	
	11:50 AM	5.5	168			06:14 AM	1.0	30	
	06:36 PM	0.2	6			12:38 PM	4.6	140	
						07:14 PM	0.9	27	
9 W	12:28 AM	4.6	140		24 Th	01:28 AM	4.0	122	
	06:39 AM	0.5	15			07:00 AM	1.2	37	
	12:54 PM	5.4	165			01:27 PM	4.4	134	
	07:39 PM	0.4	12			08:10 PM	1.0	30	
10 Th	01:34 AM	4.5	137		25 F	02:18 AM	4.0	122	
	07:50 AM	0.7	21			08:02 AM	1.4	43	
	01:58 PM	5.2	158			02:16 PM	4.3	131	
	08:48 PM	0.4	12			08:08 PM	1.1	34	
11 F	02:40 AM	4.5	137		26 Sa	03:40 AM	4.5	137	
	09:06 AM	0.7	21			09:06 AM	0.7	21	
	03:03 PM	5.2	158			03:03 PM	5.2	158	
	09:54 PM	0.3	9			09:54 PM	0.3	9	
12 Sa	03:46 AM	4.6	146		27 Su	04:42 AM	4.6	146	
	10:15 AM	0.6	18			10:15 AM	0.6	18	
	04:09 PM	5.1	155			04:09 PM	5.1	155	
	10:52 PM	0.1	3			10:52 PM	0.1	3	
13 Su	04:52 AM	4.8	146		28 M	04:52 AM	4.2	128	
	11:15 AM	0.3	9			11:06 AM	1.0	30	
	05:15 PM	5.2	158			04:53 PM	4.3	131	
	11:45 PM	-0.1	-3			11:35 PM	0.6	18	



September

October

Time	Height	Time	Height
AM 0.0	0	ft	cm
AM 5.0	152		
PM 0.1	3		
PM 5.6	171		

Time	Height	Time	Height
h	m	ft	cm
12:16	AM	0.7	21
06:24	AM	4.5	137
12:26	PM	0.8	24
06:33	PM	4.8	146

Time	Height	Time	Height
01:35 AM	0.4	12	
07:41 AM	4.7	143	
01:40 PM	0.6	18	
07:49 PM	5.1	155	

Time	Height	Time	Height
01:37 AM	0.2	6	
07:42 AM	5.1	155	
01:56 PM	0.3	9	
07:49 PM	5.1	155	

Time	Height	Time	Height
02:15 AM	0.3	9	
08:18 AM	4.9	149	
02:24 PM	0.4	18	
08:22 PM	5.2	158	

Time	Height	Time	Height
02:17 AM	0.1	3	
08:16 AM	5.4	165	
02:41 PM	0.1	3	
08:25 PM	5.1	155	

Time	Height	Time	Height
02:54 AM	0.1	3	
08:52 AM	5.1	155	
03:06 PM	0.3	9	
08:54 PM	5.2	158	

Time	Height	Time	Height
03:37 AM	-0.1	-3	
09:25 AM	5.7	174	
04:09 PM	-0.1	-3	
09:41 PM	5.0	152	

Time	Height	Time	Height
03:32 AM	0.0	0	
09:24 AM	5.2	158	
03:48 PM	0.2	6	
09:26 PM	5.2	158	

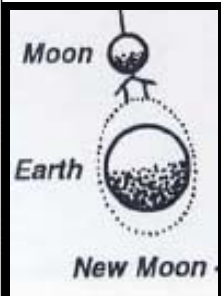
Time	Height	Time	Height
04:17 AM	-0.1	-3	
10:05 AM	5.7	174	
04:54 PM	-0.1	-3	
10:28 PM	4.9	149	

Time	Height	Time	Height
04:08 AM	0.0	0	
09:57 AM	5.3	162	
04:29 PM	0.2	6	
10:01 PM	5.1	155	

Time	Height	Time	Height
04:58 AM	0.0	0	
10:53 AM	5.6	171	
05:42 PM	0.0	0	
11:24 PM	4.7	143	

Time	Height	Time	Height
05:18 AM	0.2	6	
11:16 AM	5.3	162	
	0.6	18	
	5.0	152	
	0.8	24	

Time	Height	Time	Height
05:44 AM	0.2	6	
11:50 AM	5.5	168	
06:36 PM	0.2	6	
12:28 AM	4.6	140	
06:39 AM	0.5	15	
12:54 PM	5.4	165	
07:39 PM	0.4	12	



So...back to our question.
 When do we see the highest high tides?
 When do we see the lowest high tides?

2013 Battery Park Tide Table

September

October



Most Extreme

Less Extreme

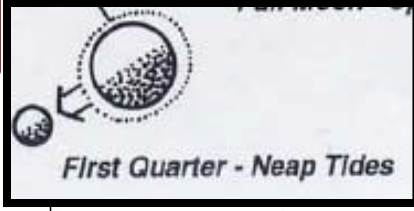
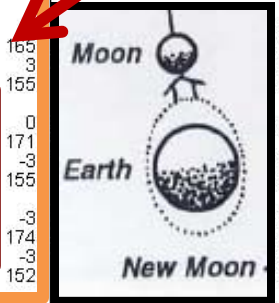
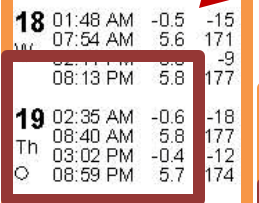
Tide tables in both graphic and tabular format are available here:

http://tidesandcurrents.noaa.gov/tide_predictions.shtml?gid=62

Weaker

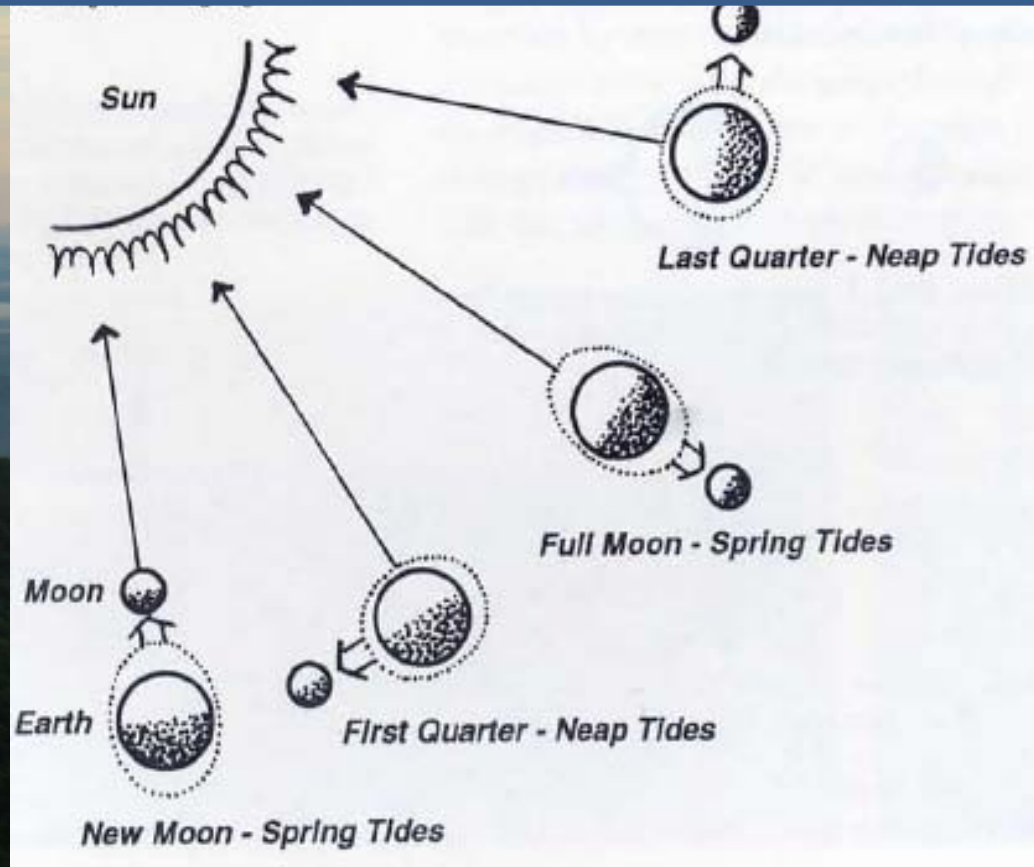
2013 Battery Park Tide Table

Time	Height	Time	Height
1 Full Moon - Spring Tides			
01:35 AM	0.4	12	0.3
07:41 AM	4.7	143	5.4
01:40 PM	0.6	18	0.1
07:49 PM	5.1	155	5.3
2			
02:15 AM	0.3	9	0.4
08:18 AM	4.9	149	4.8
02:24 PM	0.4	12	0.5
08:22 PM	5.2	158	4.9
3			
02:54 AM	0.1	3	0.2
08:52 AM	5.1	155	0.1
03:06 PM	0.3	9	0.3
08:54 PM	5.2	158	0.3
4			
03:32 AM	0.0	0	0.0
09:24 AM	5.2	158	0.0
03:48 PM	0.2	6	0.0
09:26 PM	5.2	158	0.0
5			
04:08 AM	0.0	0	0.0
09:57 AM	5.3	162	0.0
04:29 PM	0.2	6	0.0
10:01 PM	5.1	155	0.0
6			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
7			
05:18 AM	0.0	0	0.0
11:16 AM	5.0	162	0.0
8			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
9			
05:18 AM	0.0	0	0.0
11:16 AM	5.0	162	0.0
10			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
11			
05:18 AM	0.0	0	0.0
11:16 AM	5.0	162	0.0
12			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
13			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
14			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
15			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
16			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
17			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
18			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
19			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
20			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
21			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
22			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
23			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
24			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
25			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
26			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
27			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
28			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
29			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0
30			
04:43 AM	0.0	0	0.0
10:33 AM	5.0	155	0.0
05:10 PM	0.0	0	0.0
10:43 PM	4.9	149	0.0

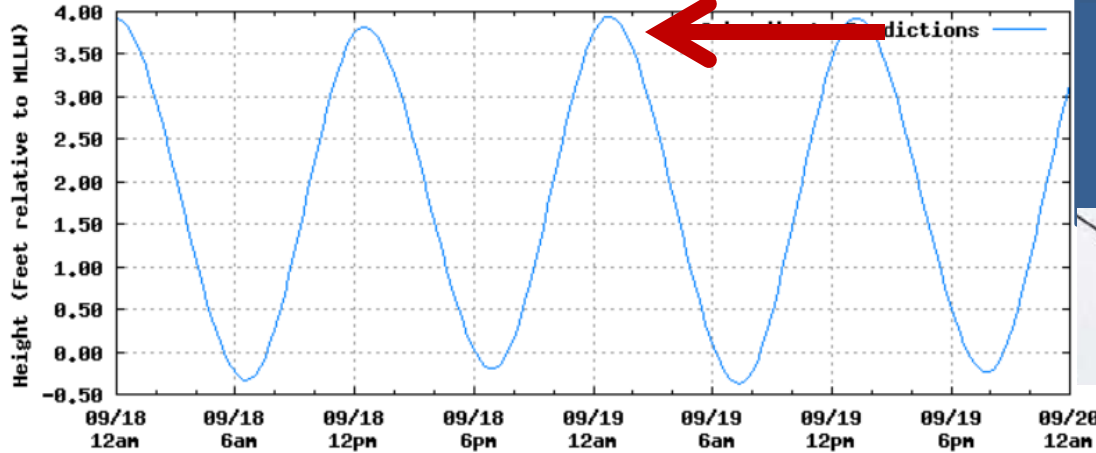


So now you know a lot about the tides,
but **are the tide tables** from the **Battery** at New York
harbor **accurate for other places** along the river?

Why or why not?

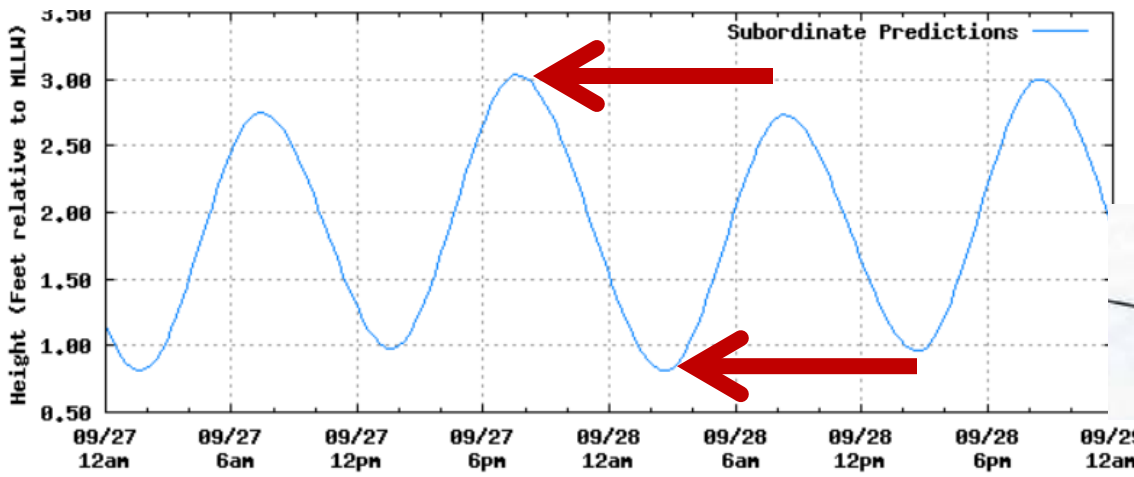


Poughkeepsie, NY

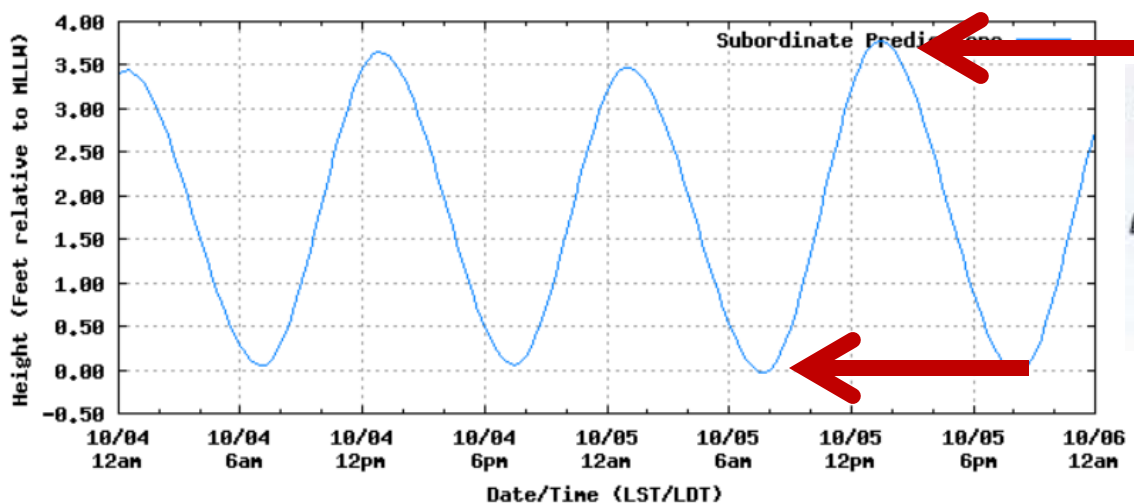


Full Moon - Spring Tides

High tides here reach only 4 feet in height.

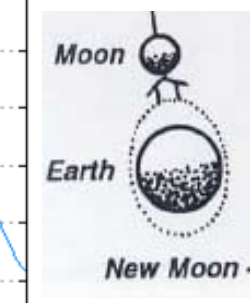
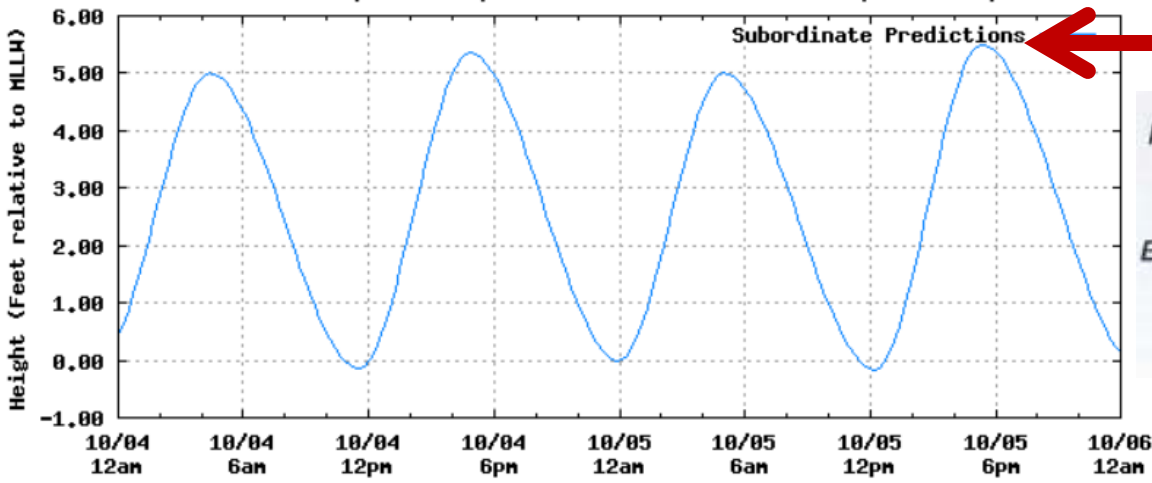
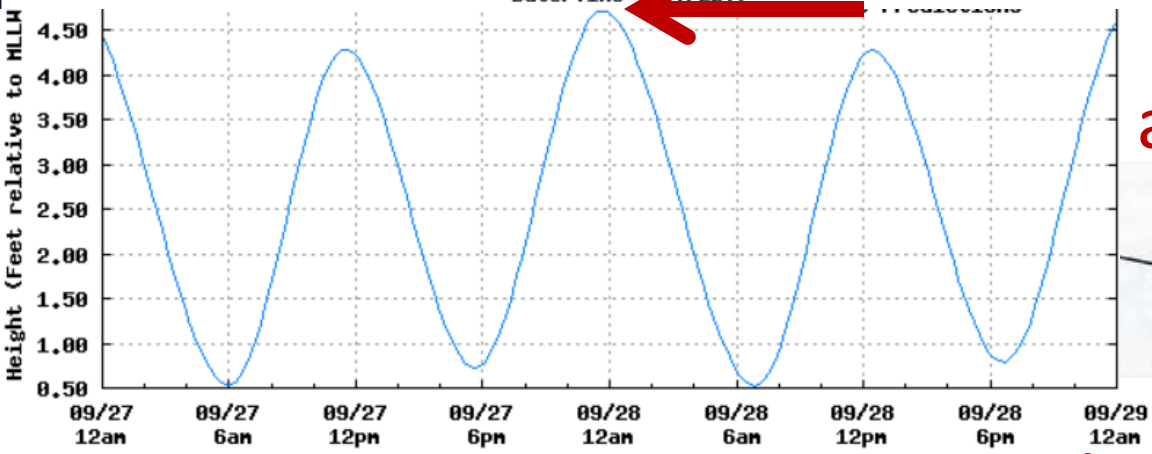
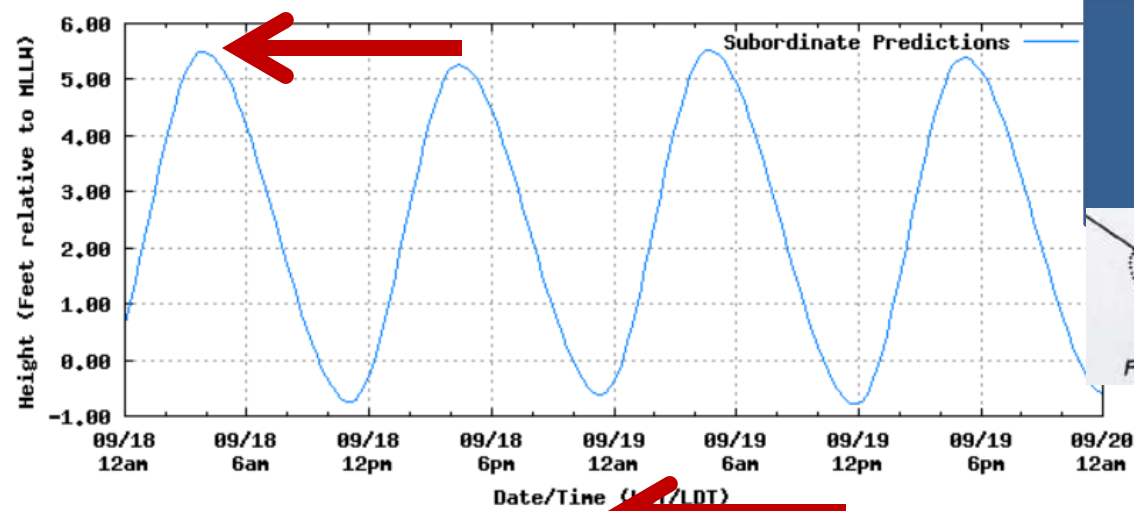


Last Quarter - Neap Tides

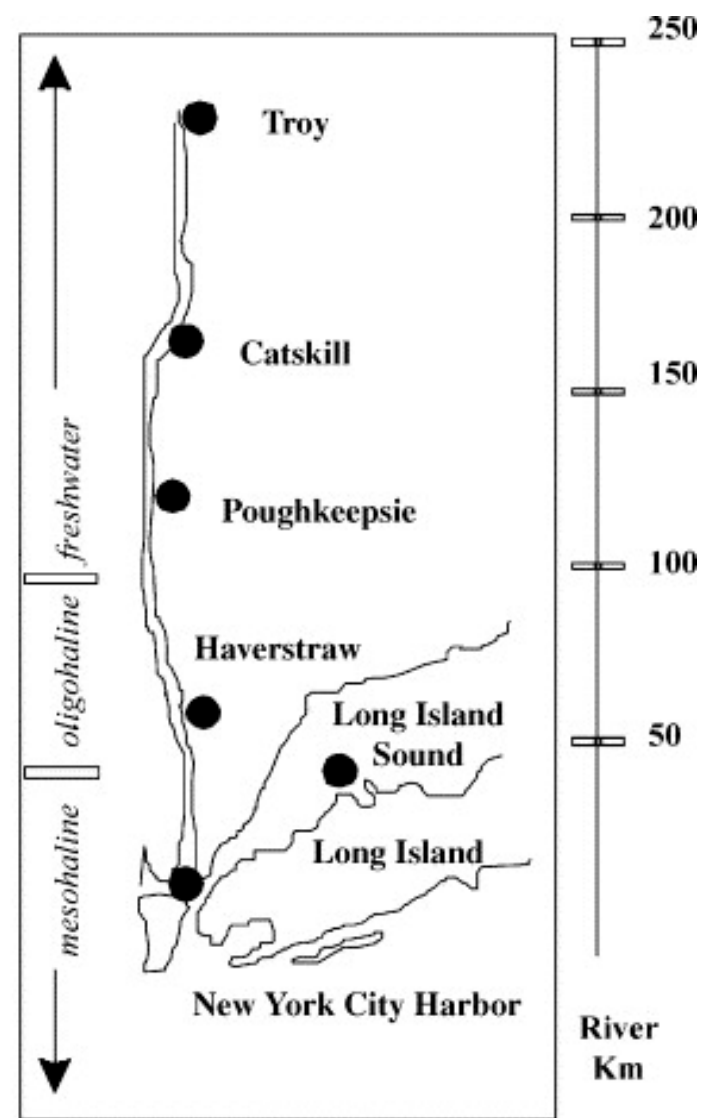
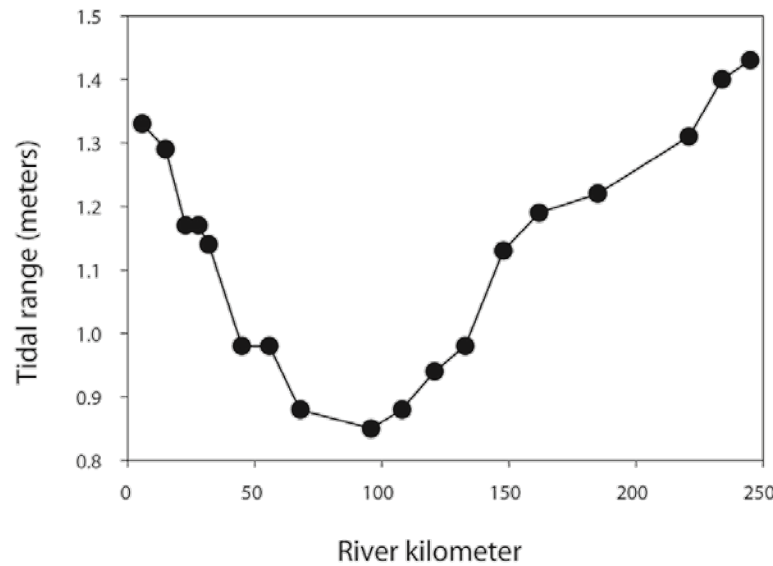
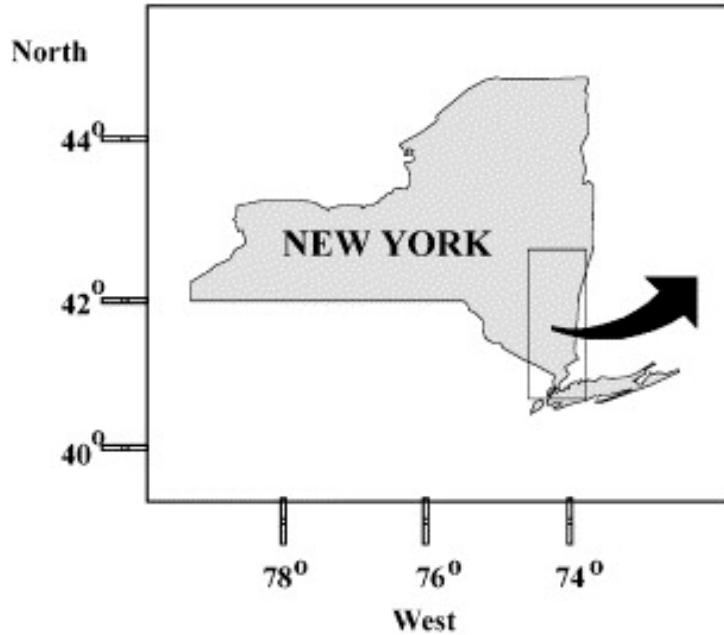


New Moon

Troy, NY



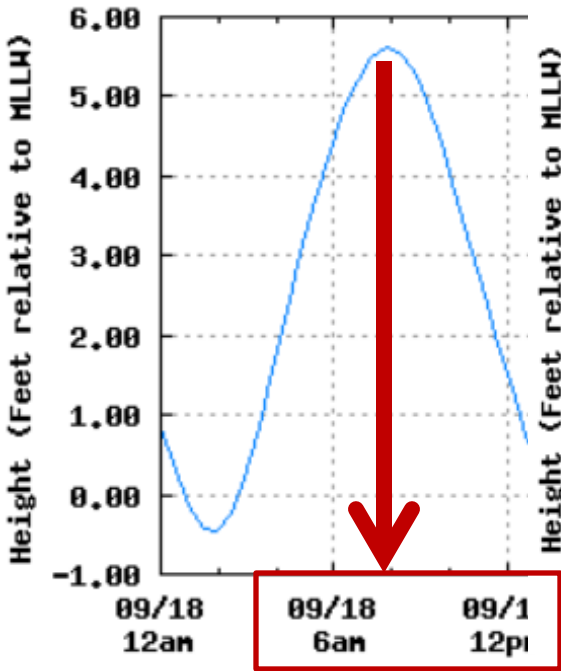
High tides here reach almost **6 feet** in height.



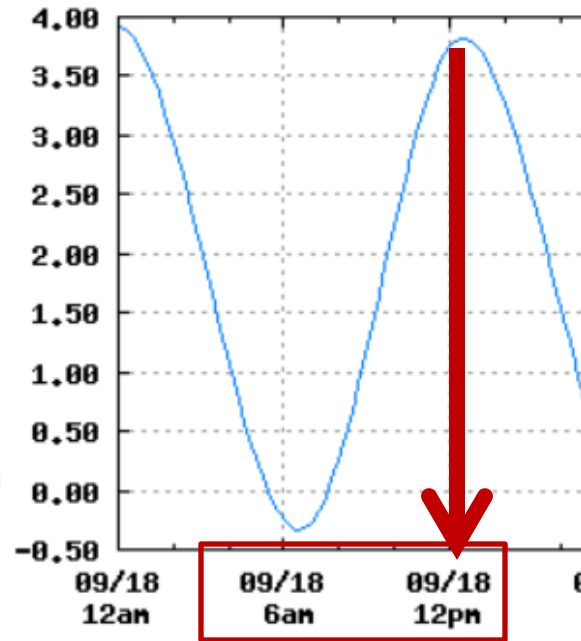
Tidal height varies along the river!

Figure from D.L. Strayer's *The Hudson River Primer*

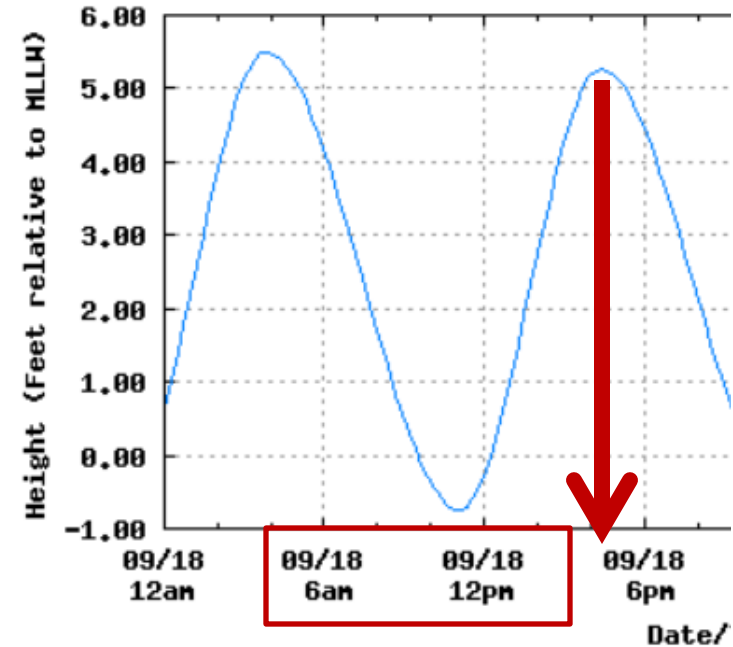
NYC- Battery



Poughkeepsie



Troy



It takes a little over **9 hours** for a tide to reach Troy.

In addition to **combating the current** from the normal **downstream flow** of the river, the incoming tide also **pushes against the outgoing tidal current**.