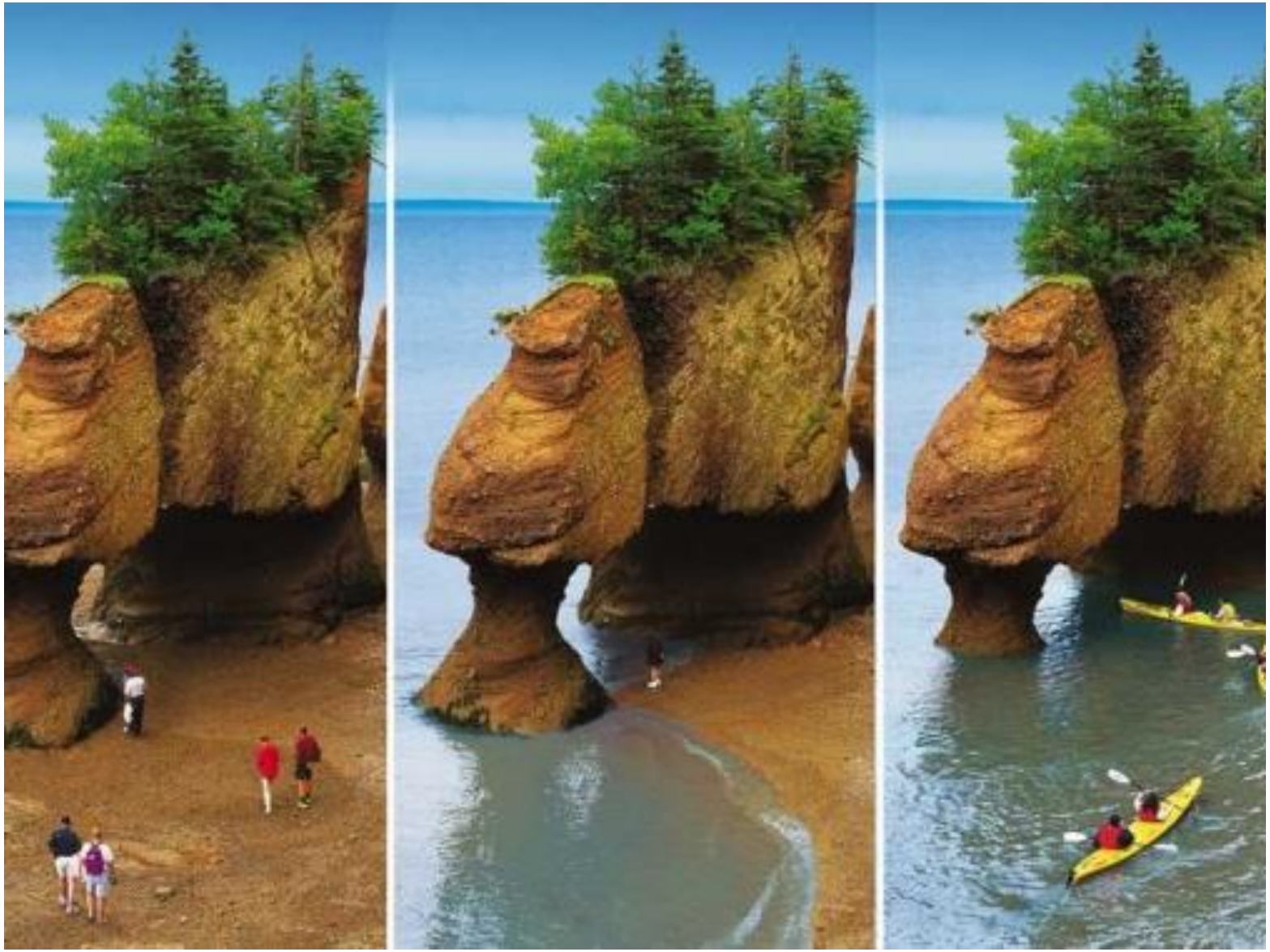
Tides

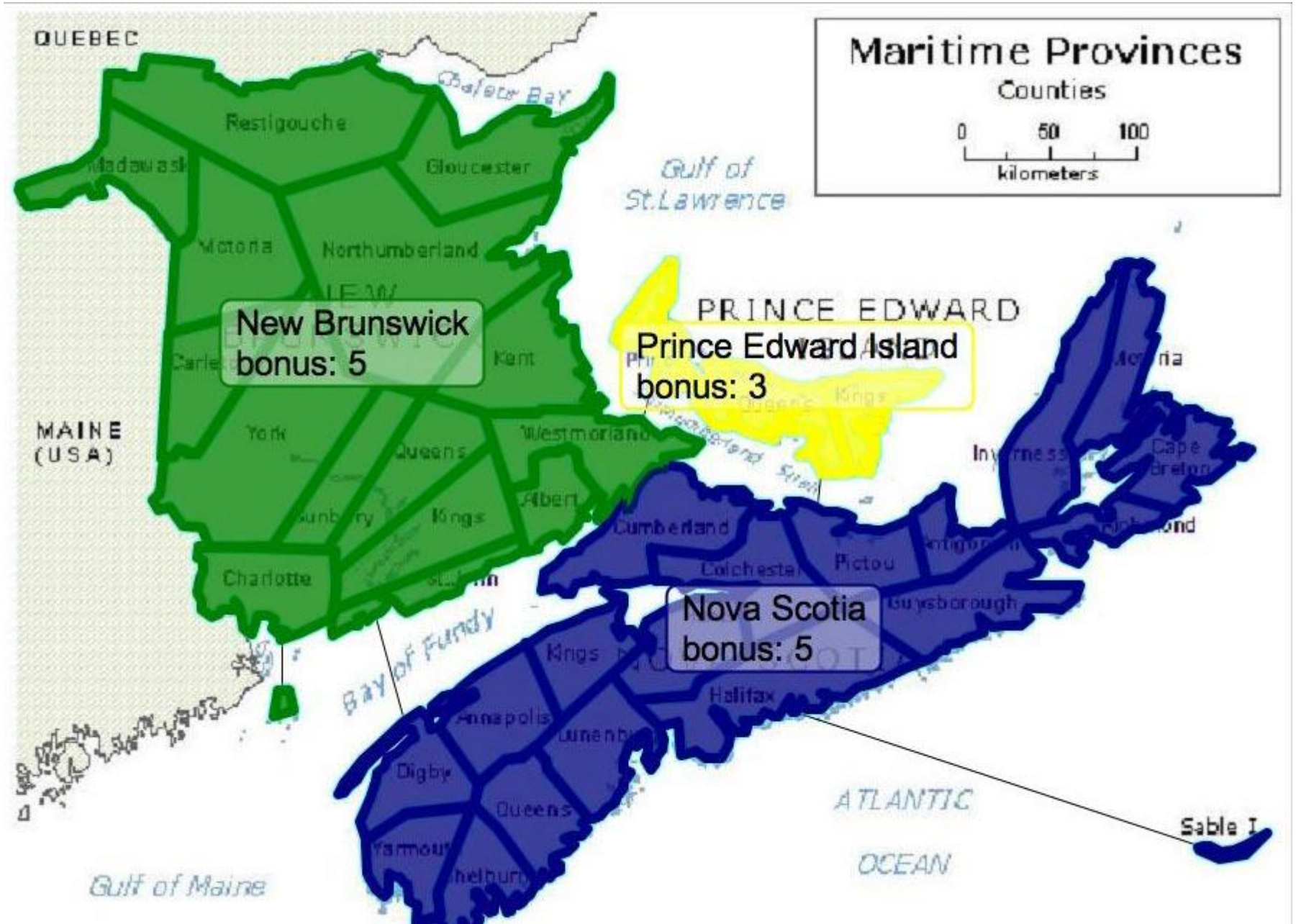
Tide Extremes in Panama

PLAYA PALENQUE AT HIGH TIDE

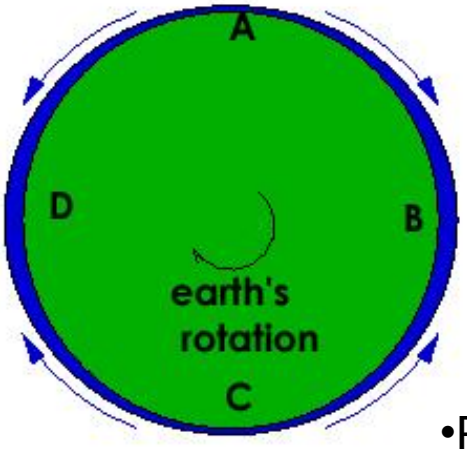
PLAYA PALENQUE AT LOW TIDE



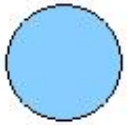
Hopewell Rocks, New Brunswick: Tide Extremes


Maritime Provinces
Counties
0 50 100
kilometers
QUEBEC
Chaleur Bay
Restigouche
Gloucester
Gulf of St.Lawrence
Victoria
Northumberland
New Brunswick
bonus: 5
Kent
PRINCE EDWARD
Prince Edward Island
bonus: 3
MAINE (USA)
York
Queens
Westmorland
Albert
Kings
Charlotte
Cumberland
Colchester
Pictou
Nova Scotia
bonus: 5
Halifax
Bay of Fundy
Annapolis
Digby
Queens
ATLANTIC
OCEAN
Sable I
Gulf of Maine


World's Highest Tides Ecozone
Moncton
Dieppe
Hillsborough
Sackville
Hopewell Cape
Dorchester Cape
Amherst
NEW BRUNSWICK
Sussex
Harvey
Marys Point
Joggins
New Horton
Waterside
Fundy National Park of Canada
Alma
Cape Enrage
Chignecto Bay
Apple River
Port Greville
Parrsboro
Five Islands
Economy
Five Islands Provincial Park
Bass River
Truro
St. Martins
Cape Chignecto Provincial Park
Advocate Harbour
Cape d'Or
Cape Split
Minas Basin
Burntcoat Head
Noel
Maitland
South Maitland
Urbania
Stewiacke
Walton
Morrow Provincial Park
Medford
Halls Harbour
Harbourville
Bay of Fundy
Margaretsville
Kentville
Wolfville
Grand Pré
Hantsport
Avondale
Windsor
Brooklyn
Shubenacadie
Middleton
NOVA SCOTIA
Valleyview Provincial Park
Port Royal
bayoffundytourism.com



(earth-moon distance not to scale)



•People seeing water at higher positions witness **high tide**.

1. What letters on the diagram show the location of high tide?

B and D

•People seeing water at lower positions witness **low tide**.

2. What letters on the diagram show the location of low tide?

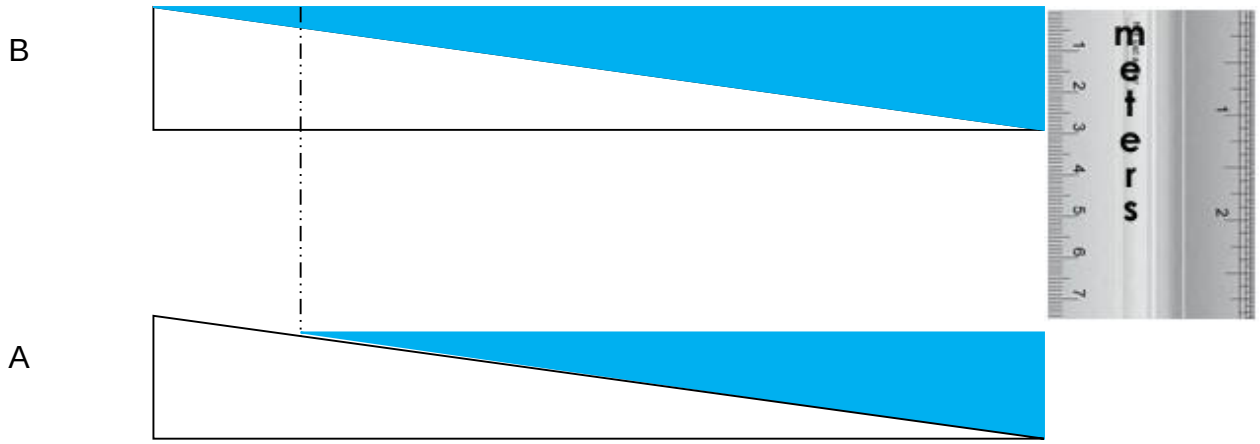
A and C

3. If the coastline (beach) where you're standing has a very shallow slope, the differences between low and high tide, will be very dramatic.

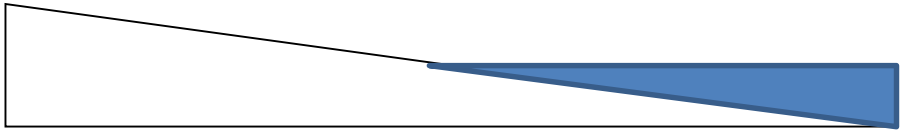
a) Which diagram reveals the coastline at high tide?_____ B

b) If you were standing on the beach at the position along the dotted line, how deep would the water be at high tide?_____

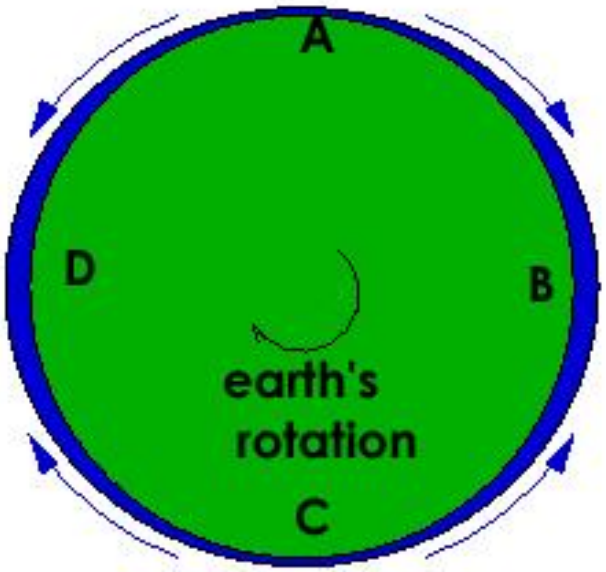
About 0.8m



•Let’s say that diagram A wasn’t low tide just yet. Redraw the coastline with an even lower level of water.

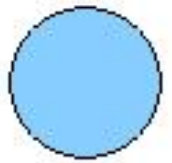


•As the earth rotates, obviously, you and the water turn with it.
•But the water facing the moon keeps bulging at the opposite ends,
•so it's as if the bulges don't move with you.



Earth

(earth-moon distance not to scale)

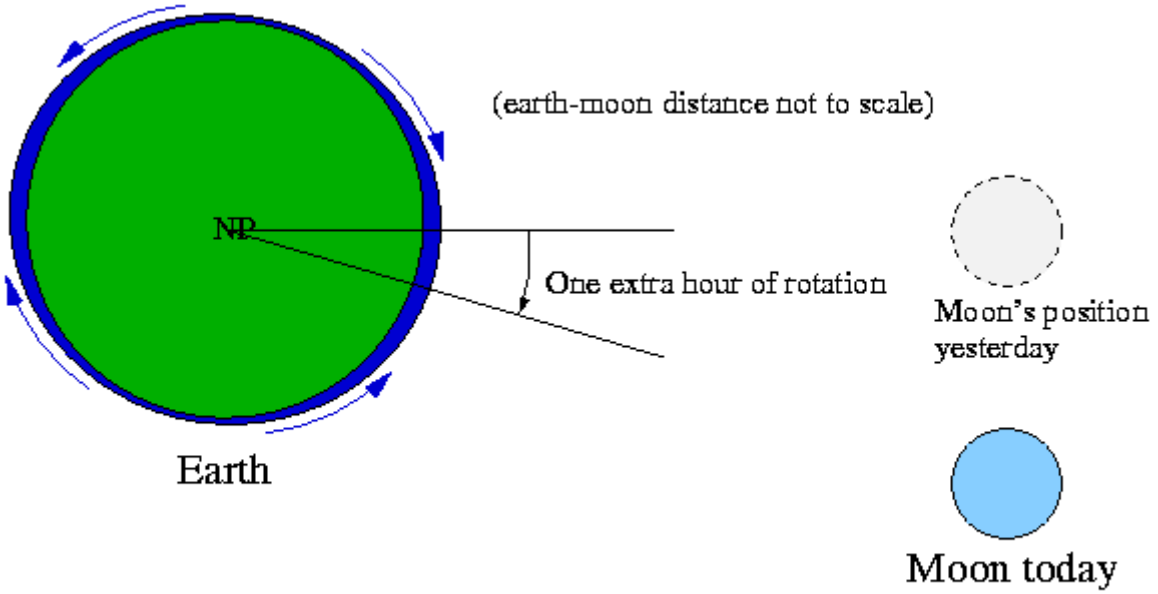


Moon

You would expect to move from position A to B in about 6 hours. In other words if it was low tide at 12 PM, it might be high tide at 6 PM. Why 6 hours? Show calculation

Expected: (24 h/day)/(4 tides/day) = 6h/tide, but not so!

In reality, you would probably have to wait not six hours but 6.25 hours. Study the diagram below and explain why.



(25 h/cycle)/(4 tides/cycle) = 6.25h/tide

Boston Light Boston Harbor

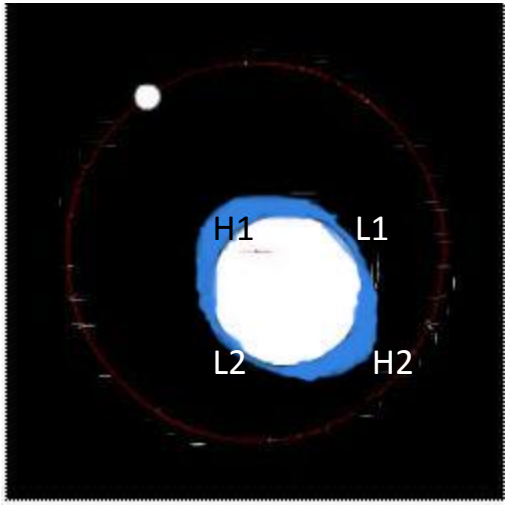
Boston Light Boston Harbor, Massachusetts

May Tide Chart

2011

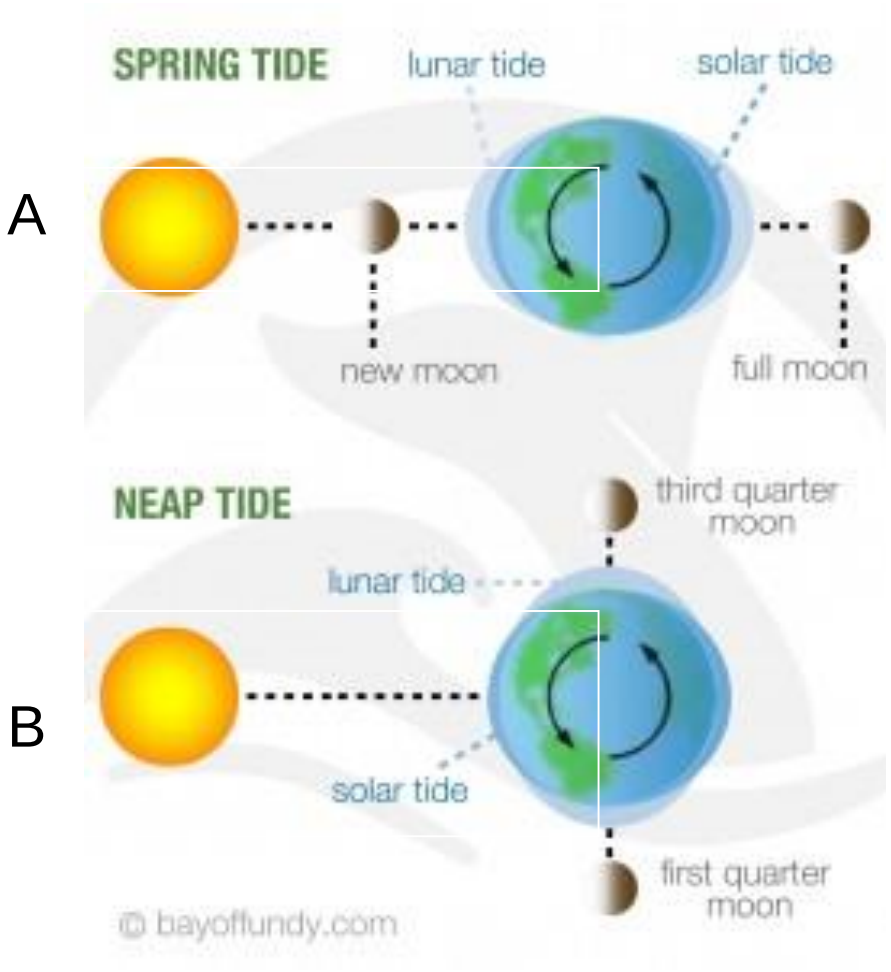
DAY	DATE	HIGH				LOW						
		AM	hgt	PM	hgt	AM	hgt	PM	hgt	rise	set	moon
Sunday	01	11:00	8.8	11:10	9.5	4:44	0.6	4:55	1.1	5:39	7:42	
Monday	02	11:40	8.8	11:46	9.6	5:24	0.3	5:34	1.1	5:37	7:44	
Tuesday	03	12:19 PM	8.8			6:03	0.2	6:12	1.0	5:36	7:45	
Wednesday	04	12:23	9.7	12:58	8.8	6:43	0.1	6:51	1.1	5:35	7:46	
Thursday	05	1:01	9.8	1:37	8.7	7:22	0.0	7:31	1.1	5:34	7:47	
Friday	06	1:40	9.8	2:18	8.7	8:04	0.1	8:13	1.1	5:32	7:48	
Saturday	07	2:22	9.8	3:01	8.6	8:47	0.1	8:58	1.2	5:31	7:49	
Sunday	08	3:07	9.7	3:48	8.6	9:33	0.2	9:47	1.2	5:30	7:50	
Monday	09	3:56	9.6	4:39	8.7	10:23	0.2	10:41	1.2	5:29	7:51	
Tuesday	10	4:51	9.5	5:33	8.9	11:16	0.3	11:39	1.0	5:27	7:52	
Wednesday	11	5:49	9.5	6:29	9.2	12:12 PM	0.2			5:26	7:53	
Thursday	12	6:50	9.5	7:26	9.7	12:40	0.7	1:09	0.1	5:25	7:54	
Friday	13	7:52	9.6	8:22	10.2	1:41	0.2	2:06	-0.0	5:24	7:55	
Saturday	14	8:52	9.7	9:17	10.7	2:41	-0.3	3:01	-0.2	5:23	7:56	
Sunday	15	9:51	9.9	10:11	11.1	3:39	-0.9	3:56	-0.4	5:22	7:57	
Monday	16	10:48	10.0	11:03	11.4	4:34	-1.3	4:49	-0.5	5:21	7:58	
Tuesday	17	11:43	10.1	11:55	11.4	5:27	-1.6	5:40	-0.5	5:20	7:59	
Wednesday	18	12:36 PM	10.0			6:19	-1.6	6:32	-0.3	5:19	8:00	
Thursday	19	12:46	11.3	1:28	9.8	7:10	-1.4	7:22	-0.1	5:18	8:01	
Friday	20	1:37	11.0	2:19	9.6	8:01	-1.1	8:13	0.3	5:17	8:02	
Saturday	21	2:28	10.6	3:11	9.3	8:51	-0.6	9:05	0.7	5:16	8:03	
Sunday	22	3:20	10.0	4:03	9.0	9:42	-0.1	9:58	1.1	5:16	8:04	
Monday	23	4:14	9.5	4:55	8.8	10:33	0.5	10:53	1.4	5:15	8:05	
Tuesday	24	5:08	9.0	5:49	8.6	11:26	0.9	11:50	1.6	5:14	8:06	
Wednesday	25	6:04	8.6	6:41	8.6	12:18 PM	1.3			5:13	8:07	
Thursday	26	7:01	8.4	7:32	8.7	12:47	1.7	1:10	1.5	5:13	8:08	
Friday	27	7:57	8.2	8:20	8.8	1:43	1.6	2:00	1.6	5:12	8:09	
Saturday	28	8:49	8.2	9:07	9.0	2:36	1.4	2:48	1.6	5:11	8:10	
Sunday	29	9:39	8.3	9:50	9.3	3:25	1.1	3:33	1.6	5:11	8:11	
Monday	30	10:26	8.4	10:33	9.5	4:11	0.8	4:17	1.4	5:10	8:11	
Tuesday	31	11:10	8.5	11:14	9.7	4:54	0.5	5:00	1.3	5:09	8:12	

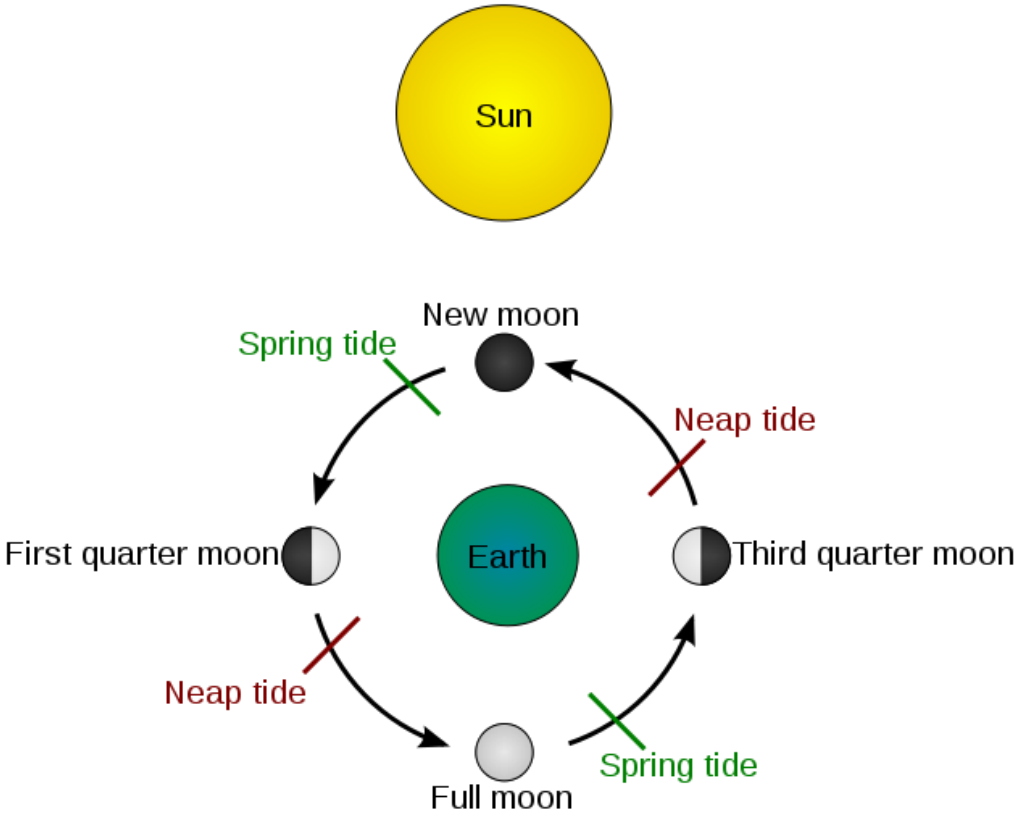
NDT	(m)	(ft)
03:53	**0.9**	3.0
10:34	**0.3**	1.0



The following diagram shows how the sun can make high tides higher and low tides even lower. In which situation (A or B) do you think we experience the highest high tides?_____

A





During which phases of the moon does the sun accentuate the tides?

New moon and full moon