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Oceanography

ANALYZING U.S TIDAL DATA ANSWERS

1. How are diurnal, semidiurnal and mixed tides different? Describe each type in terms of number, size and timing of high and low tides.

A: Semidiurnal tides are tides that happens twice daily each lunar day, consisting of 2 high tides and 2 low tides of almost equal level. On the other hand, a diurnal tide happens daily consisting of only one high and low tide. And a mixed tide which can also be called a semidiurnal mixed is a tidal pattern if high or low tides are successful on their different heights throughout the cycles. All these three tides are similar in the way the water positions whether being low or high they combined each other throughout the cycle.

1. In addition to the position and gravitational pull of the sun and the moon, what are at least 2 other important factors influencing the heights and times of tides in any given location?

A: The shape of the basin has a great impact on tides. Tidal patterns can vary from shapes and size. For example; if a basin is wide enough and symmetrical the amphidromic system develops a much larger system of the open ocean. If the basin is narrowed and restricted the tide wave crest can’t rotate so it moves in and out of the bay.

1. How are spring and neap tides different? What accounts for their differences? Describe each using terminology and examples from your learning

A: Spring tides are large tides caused by linear alignment of the sun, earth, and moon. They occur at a 2-week interval to a new and full moon. Neap tides, form when the moon, earth, and sun form a right angle. During neap tides high tides are not very high and low tides are not very low. However, they also occur at a 2-week interval arriving a week after spring tides. During the spring tide cycle the earth turns around horizontally and during neap tides the earth turns around vertically.

1. Find the link for the tidal gauge at Hilo, Hawaii (HI). Click on this link to bring up a 3-day chart of tides in this area. Using the information on the page: what does the blue line on the tidal graph represent?

A: (From April 5th-April 6 ,2018) The blue line on the tidal represents the predictions observed on the water levels.

1. Still using the Hilo, Hawaii (HI) tidal chart, use the tools on the page to answer this question: what is the predicted tidal range for the following week? (Note: show your work used to calculate the tidal range and include correct units of measurement).
2. Between April 5th -April 6, 2018 tidal range started with a predicted 0.667 ft. and a preliminary 1.12 ft. By 23:54 GMT of April 6th the predicted range was 0.365 with no preliminary data. My observation was that the predicted range starting on April 5th kept changing between high and low heights throughout the day as well on April 6th being very inconsistent.
3. Using the same graph, what type of tide will Hilo, Hawaii (HI) experience during this time? (Hint: your choices are diurnal, semidiurnal, or mixed; only choose mixed if there is a significant difference of more than several feet between the different highs or lows).
4. Mixed tides.
5. Let’s assume that you are on an oceanography class field trip in California. You plan to visit the lighthouse in Crescent City on (choose a date in the near future) but learn that it is only accessible at low tide. Knowing that the lighthouse is open from 8 A.M. to 8 P.M. LOCAL TIME (LDT/LST) that day and using the dropdown menus below the graph, determine the best time to visit the lighthouse on March 2nd. (Hint: You will need to use the options beneath the graph to change the date range AND the Time Zone).

A: In March 04th -March 05th the best time to arrive at the lighthouse is at 19:30 LST/LDT.

1. Go back to the main listing of tidal stations and find the link for the station at Bar Harbor, Maine (ME). What is the predicted tidal range for Bar Harbor for the following week? (Note: show your work used to calculate the tidal range and include correct units of measurement).
2. A: Between April 5th -April 6, 2018 tidal range started with a predicted 0.905 ft. and a preliminary 1.76 ft. Around 13:06 GMT of April 5th tides ranges started to drop at a prediction of 0.213 ft with a preliminary of -0.23 ft. On April 6th prediction was of 4.114 ft.
3. Continue looking at the tidal graph you created for Bar Harbor, Maine (ME); What type of tide does Bar Harbor experience? (Hint: your choices are diurnal, semidiurnal, or mixed; only choose mixed if there is a significant difference of more than several feet between the different highs or lows).

A: semidiurnal

1. Go back to the main listing of stations. Find the station for St. Petersburg, Florida (FL) and choose a date range of one week. What type of tide does St. Petersburg experience? (Hint: your choices are diurnal, semidiurnal, or mixed; only choose mixed if there is a significant difference of more than several feet between the different highs or lows).

A: mixed tides

1. Continue looking at the tidal graph you created for St. Petersburg, Florida (FL); What is the tidal range in St. Petersburg, FL for that week? (Note: show your work used to calculate the tidal range and include correct units of measurement).

A: In April 5th tidal range started from a predicted 1.212 ft with a preliminary 1.86 ft decreasing at 00:30 GMT with a prediction of 0.975 ft and a preliminary of 1.61 ft. April 6th at 23:54 GMT prediction was 1.773 ft. with no preliminary data.

1. Contrast the tides at Bar Harbor, Maine to those at St. Petersburg, Florida. In what

3 ways do the tidal ranges in the two locations differ? What might account for these differences? Use appropriate terminology to answer this question. Your answer should be 3-5 sentences in length and should be specific in contrasting the tides in the two locations.

A: According to the tides chart, there is a notorious difference between these two locations. Tides in Bar Harbor seem to maintain a semidiurnal tide with water levels being high and low. However, in St. Petersburg water levels seem more inconstant being mixed tides with different heights throughout the cycle.

1. Go back to the main listing of stations. Find the station for Seward, Alaska (AK). Using the dropdown menus, please change the date range to show one month (+/- a few days if the graph won’t plot). During which dates will Seward experience spring tides? Explain how you know.

A: Large tides (spring tides) are found between April 1st -April 2nd, then again between April 17-April 18, and finally at the end of the month by April 29-April 30. This happens every other 2 weeks because spring tides occur at a 2-week interval to new and full moon.