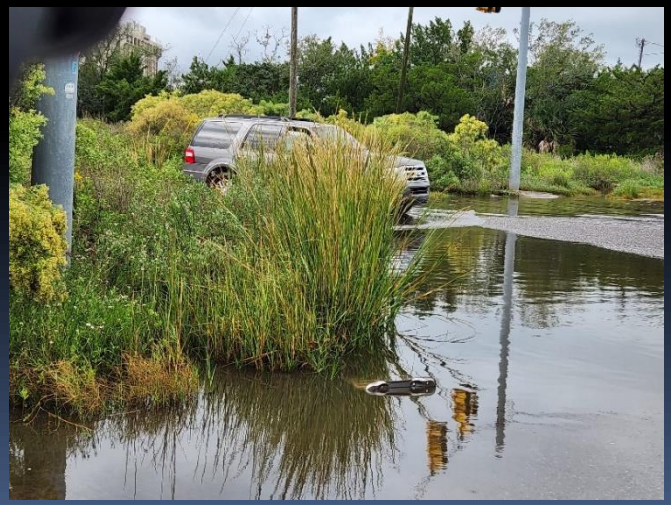
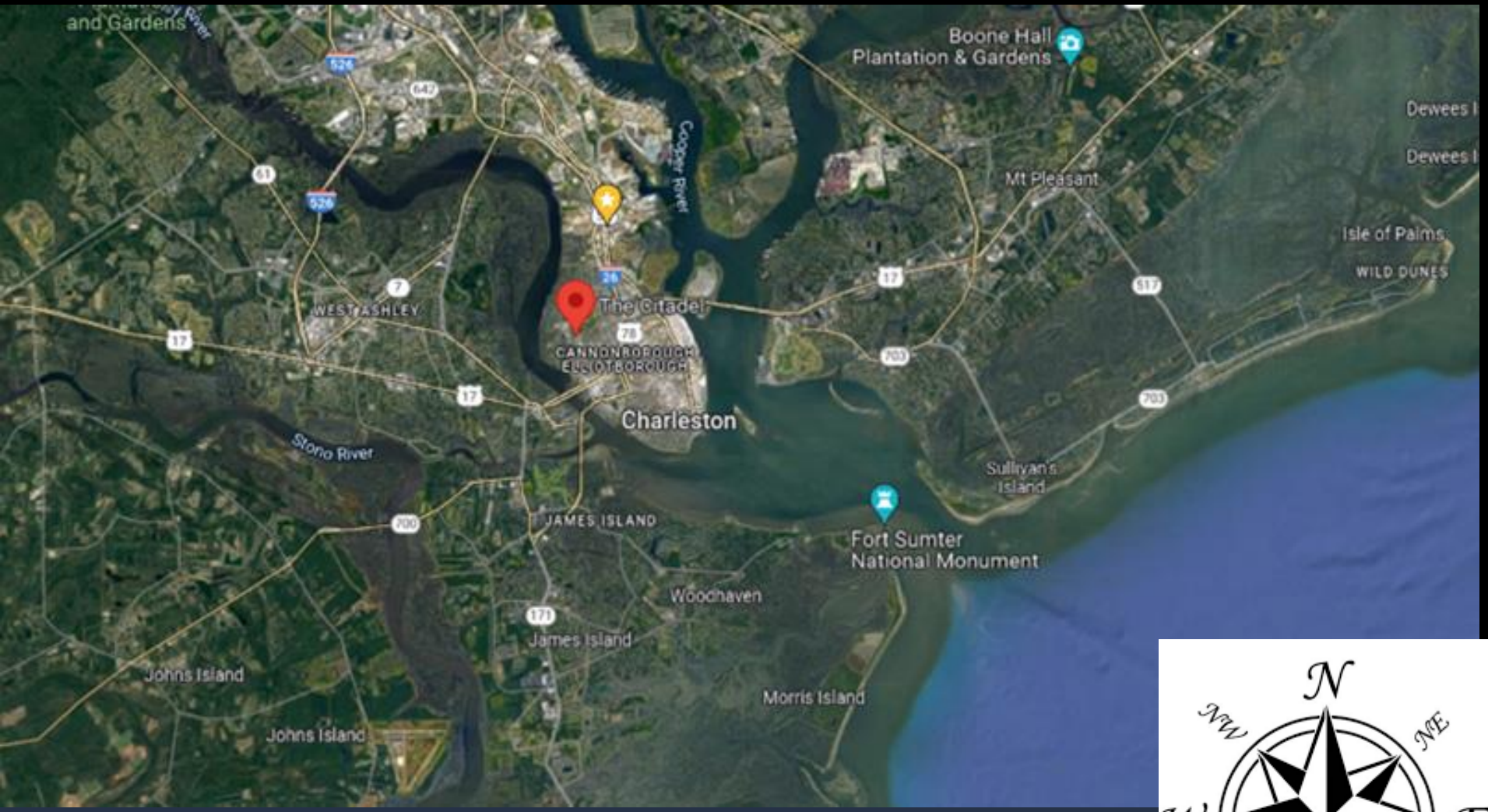
How do the MOON and TIDE phase, plus the WIIND DIRECTION and SPEED, AMPLIFY flooding situations?





NOTICE HOW A WIND BLOWING FROM THE SOUTHEAST (SE) would directly push water onshore in Charleston.

Power Knowledge

- Why do we have moon phases and tides at all? (Use the terms Earth, moon, rotate, revolve, gravity, and tidal bulge in your answer.)
- Why are tides shown as WAVES on a tide chart?
- Why is a full or new moon high tide (a SPRING TIDE) so much higher than a tide at a quarter moon (a NEAP TIDE)?
- What is a "KING TIDE?"
- Be able to draw or use models that explain these questions.


sun
Third Quarter
Waning Crescent
Waning Gibbous
New Moon
Full Moon
Waxing Crescent
Waxing Gibbous
First Quarter

A Way to remember the shape and size of the phase during the phase cycle

- Wax on toward the Right (Moon is getting bigger.)
- Wane off toward the Left (Moon is getting smaller.)

WAXING GIBBOUS

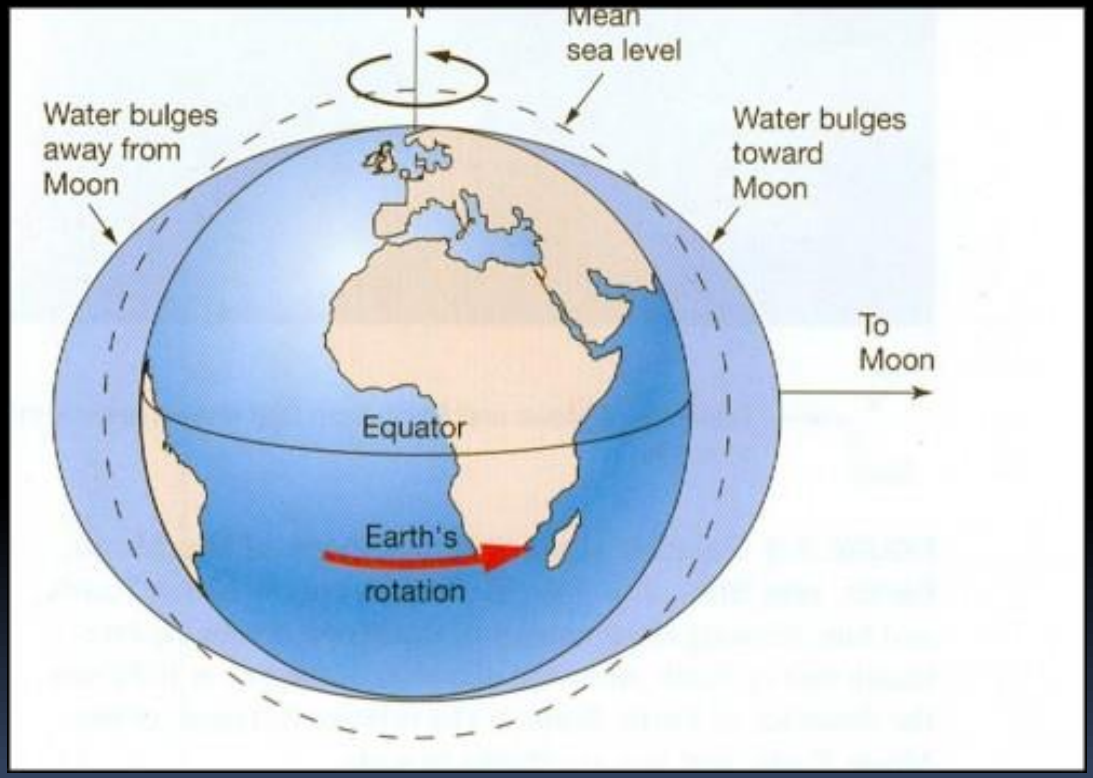
WANING GIBBOUS

A time lapse tide cycle

Why do we have tides?

Why does knowing the phase f the moon matter?

Both the moon and Sun's gravity both pull on Earth's water to cause tidal bulges.



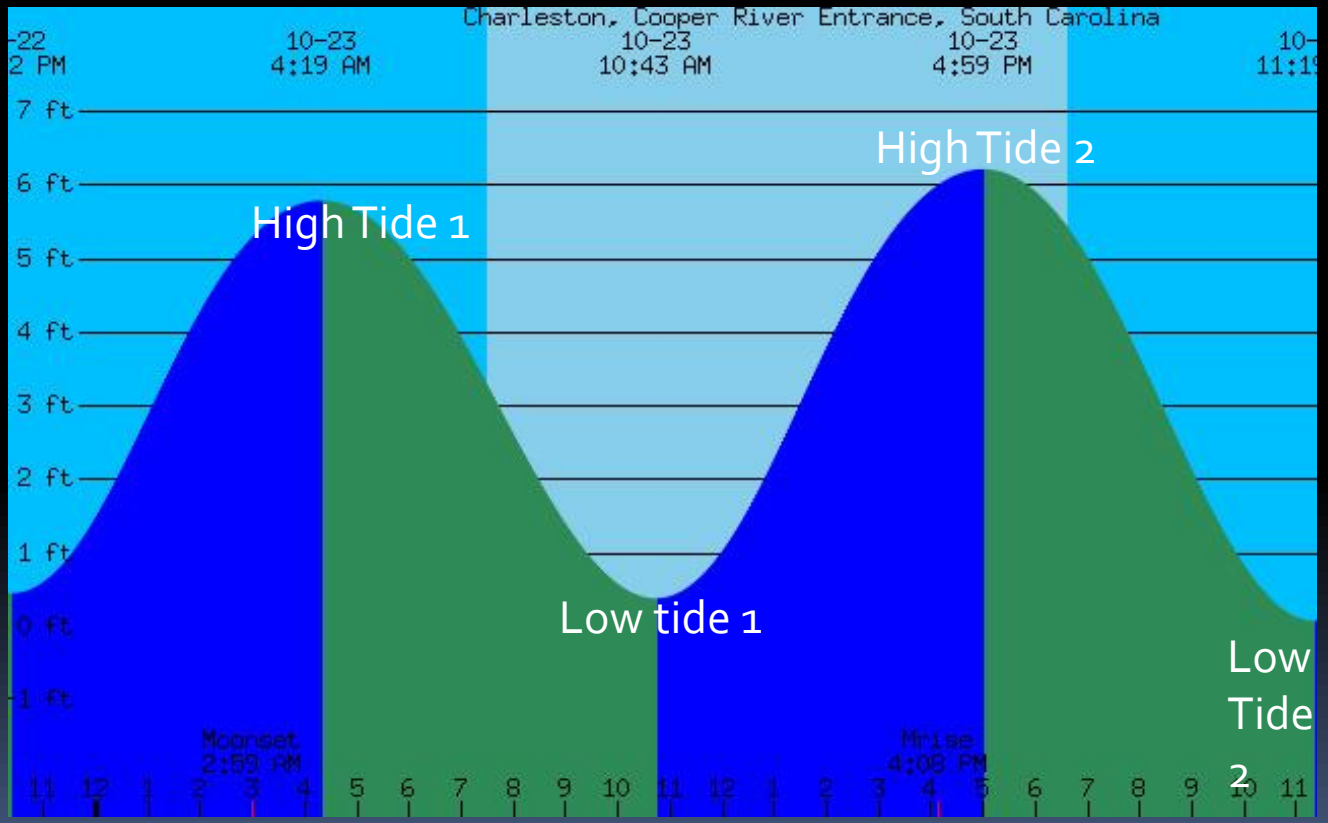
Because it is closer to the Earth than the Sun, the moon's gravity pulls harder on the Earth's water than does the Sun.

Each day, as the Earth rotates, Charleston experiences 2 high tides of about the same height and 2 low tides of about the same height. Since the pattern repeats each half-day, the scientific word **semidiurnal** is used.

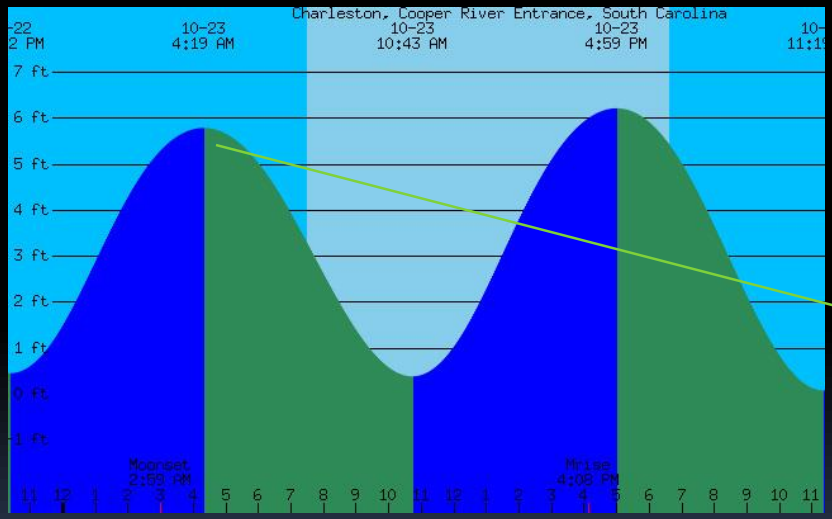
Word root origin

Semi = half

Diurnal = daily

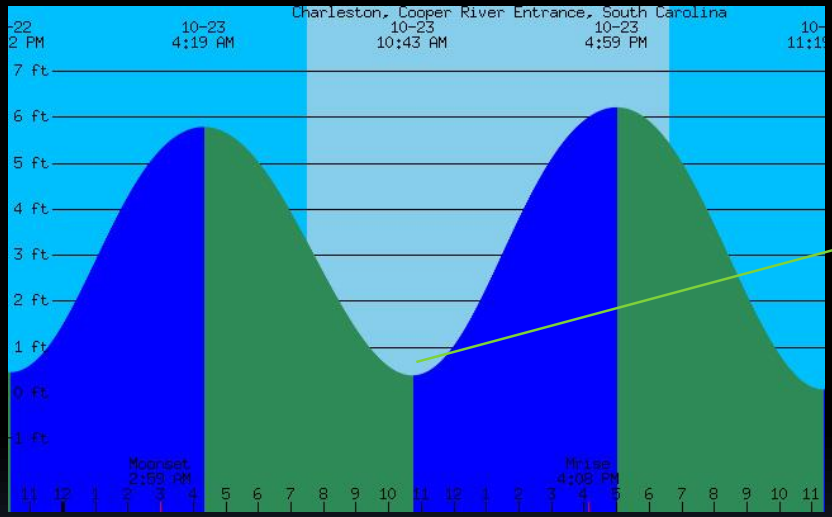


As Charleston rotates *under* the tidal bulge, there is the first HIGH TIDE of the day.

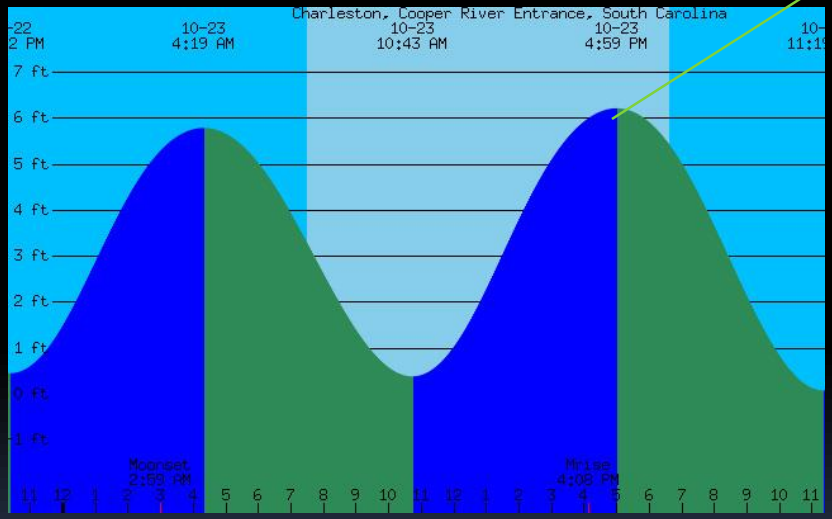


Moon

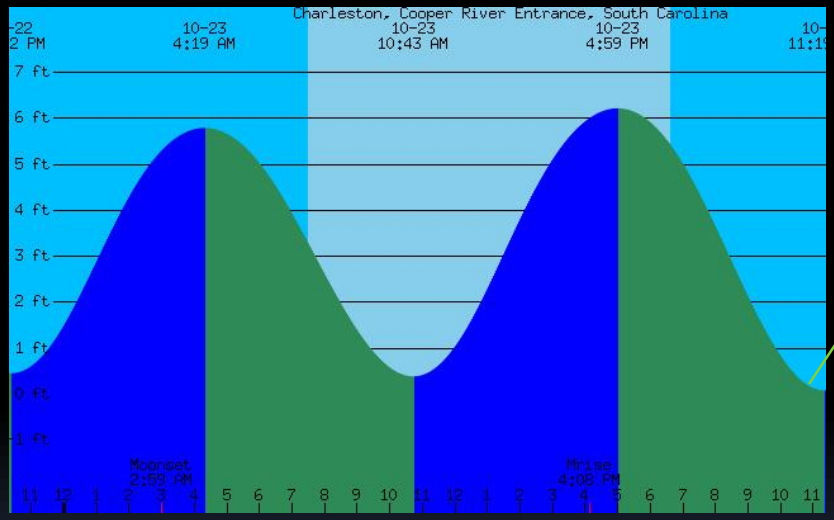
Charleston Low Tide 1



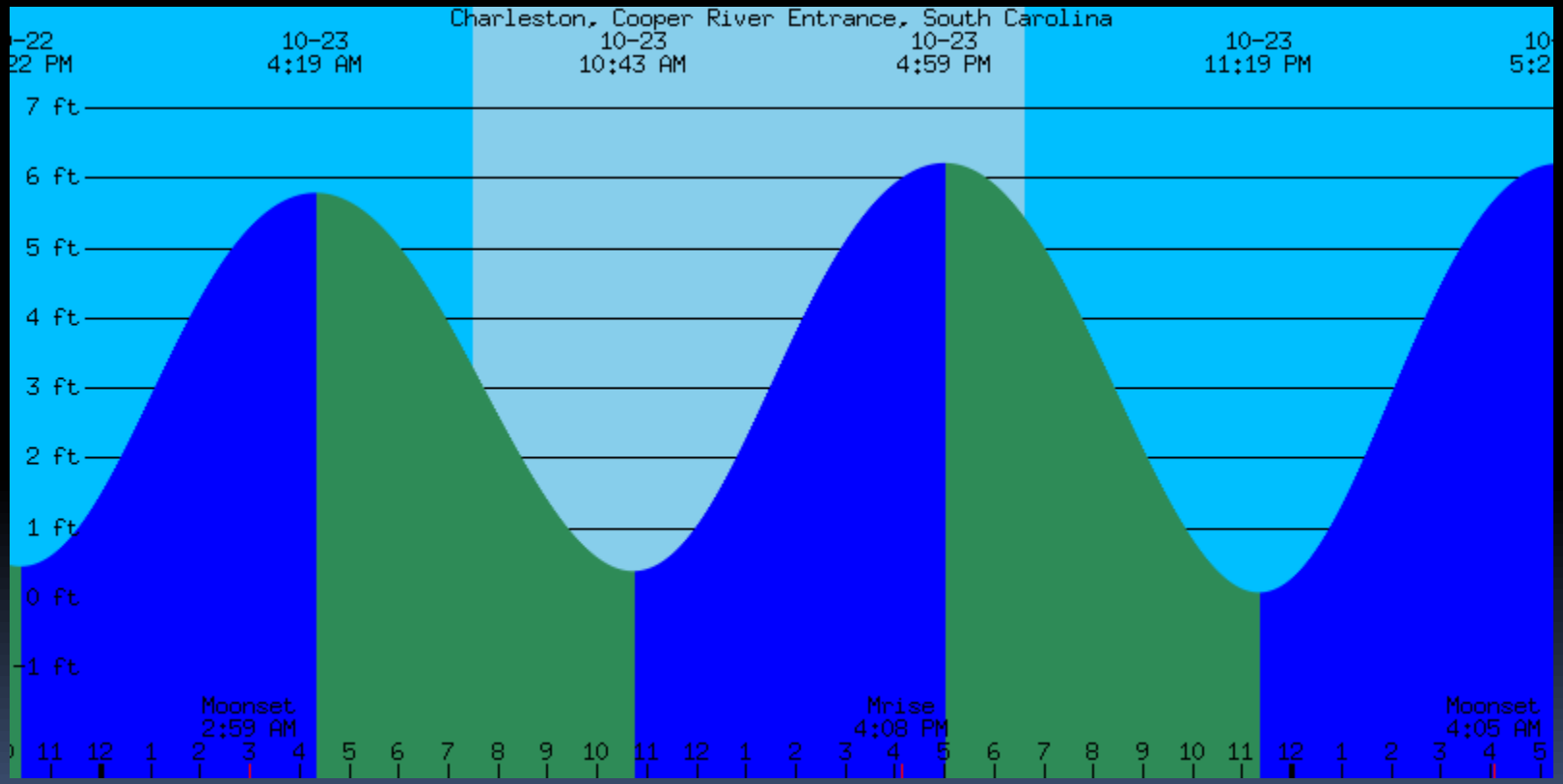
Charleston High Tide 2



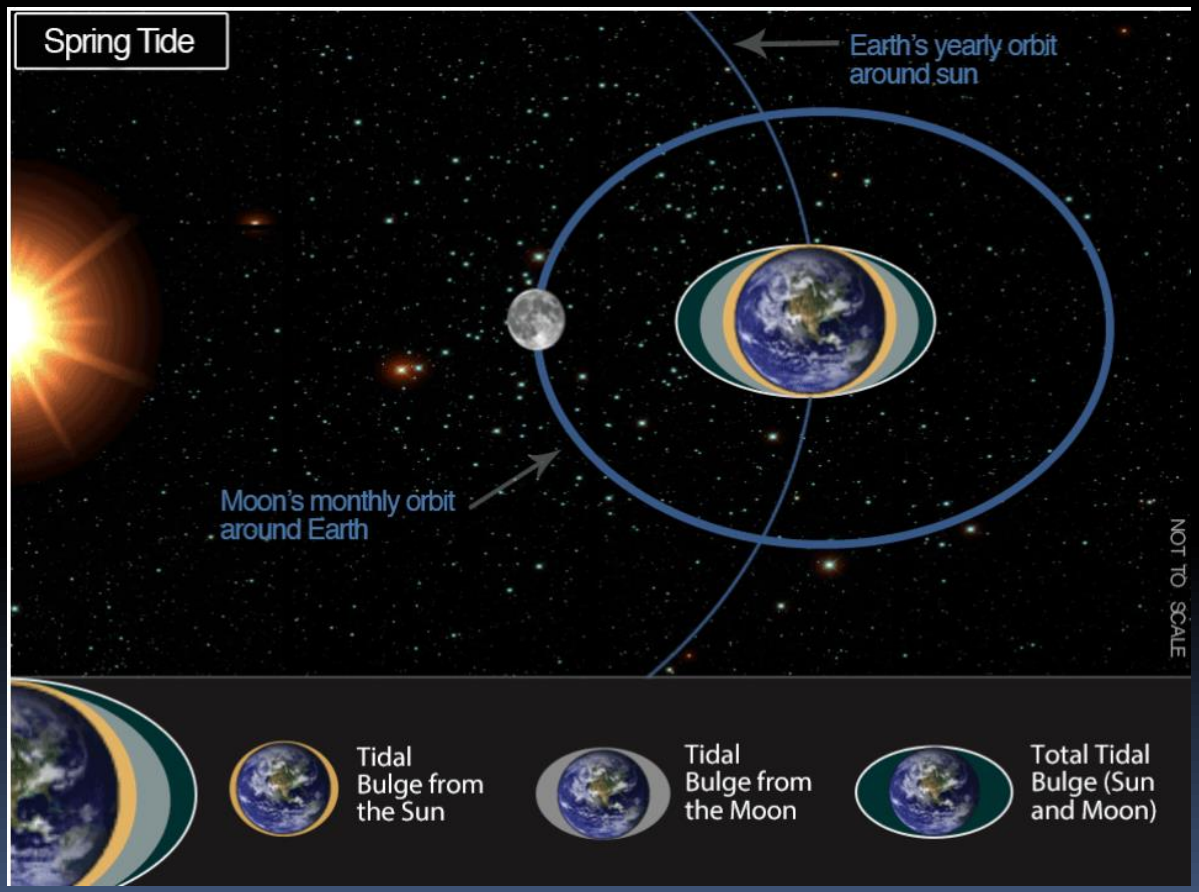
Charleston Low Tide 2



Each HIGH TIDE is caused by the Earth rotating into the highest part of the tidal bulges on either side of the Earth

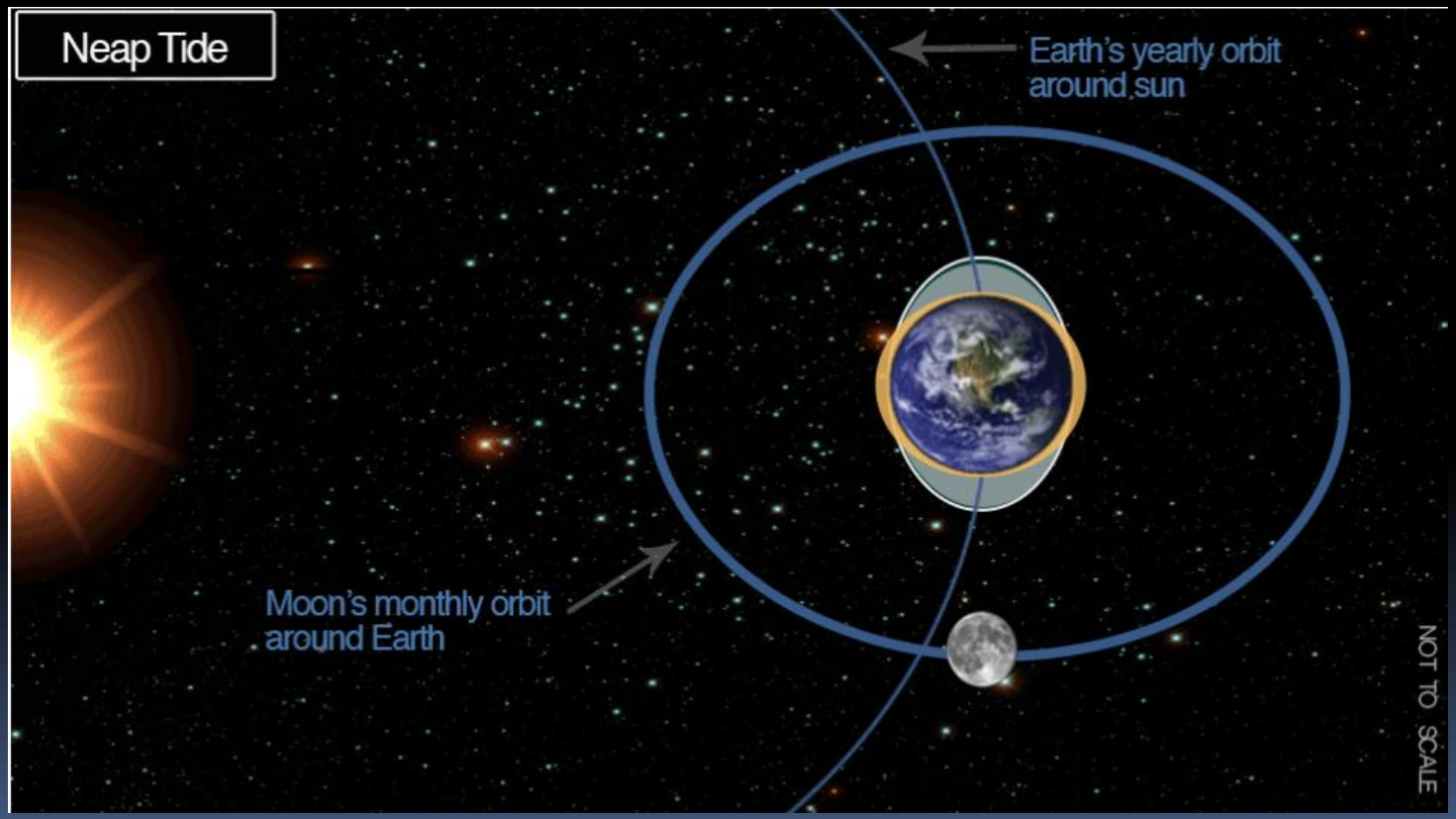


At full and new moons, the Sun and moon's gravity combine to cause higher high tides and lower low tides to "spring forth" than at any other phase.



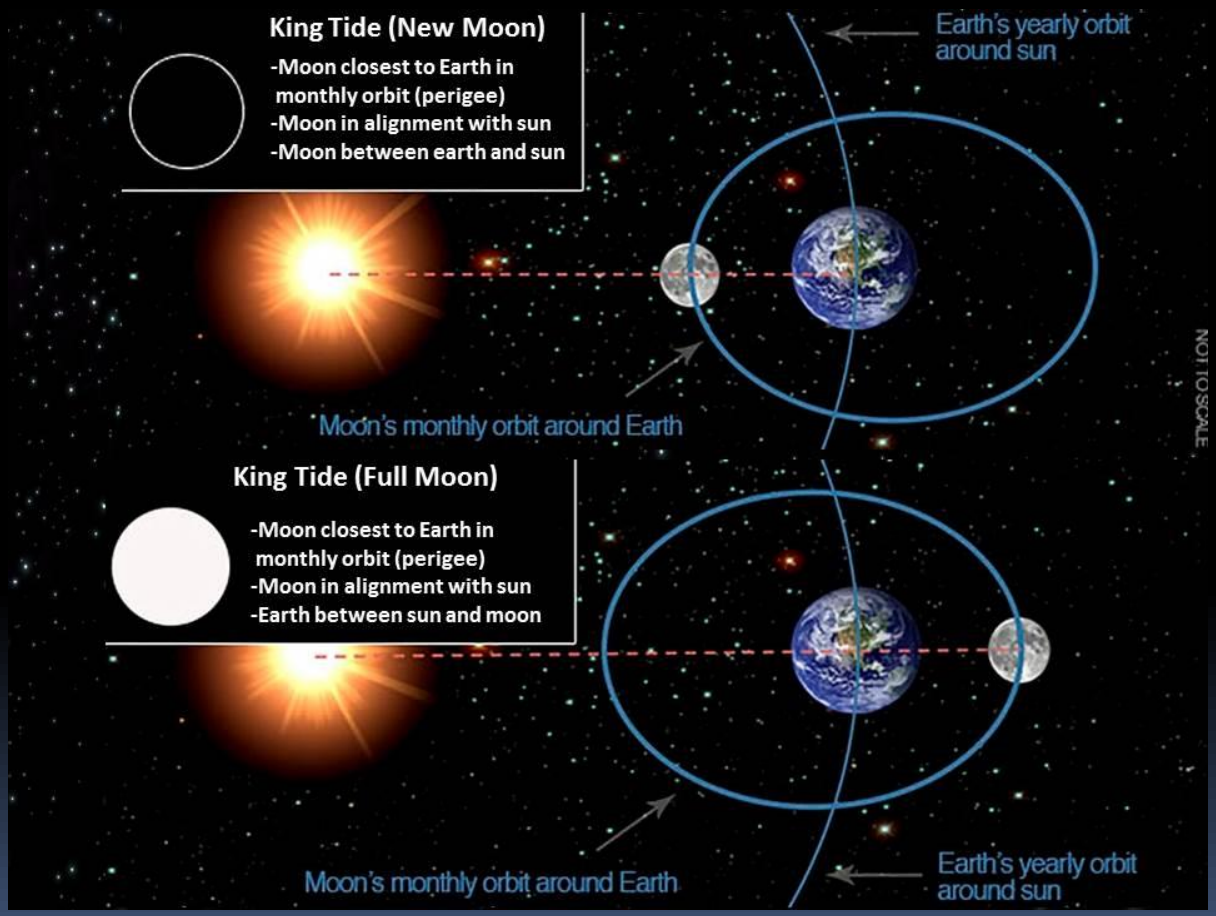
Source: http://oceanservice.noaa.gov/facts/springtide.html

At first and third quarter of the lunar cycle, the moon and Sun's gravity pull in opposite directions, leading to only moderate, or NEAP tides.



SOURCE: http://oceanservice.noaa.gov/facts/springtide.html

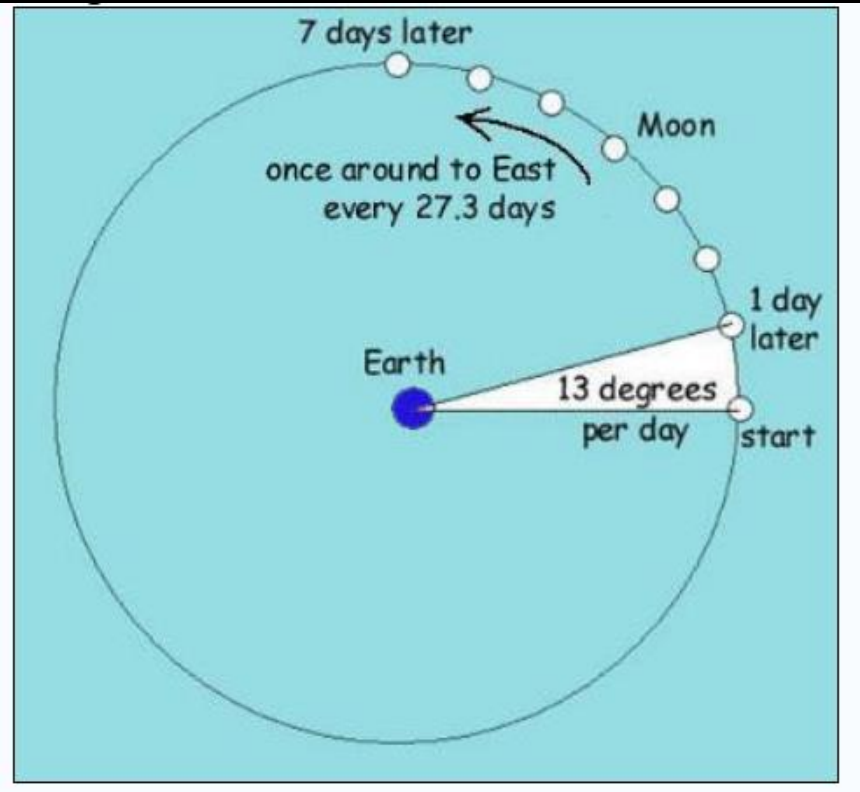
KING TIDES are a special kind of spring tide that occur when the moon is closest to the Earth (at perigee) in its orbit.



http://gulfofmaine.kingtides.net/wp-content/uploads/sites/4/2013/05/king-tide-diagram1_20.jpg

Which phases are waxing and which are waning?

Why does the moon rise about 50 minutes later each day?



Key facts: The moon's orbit around the Earth takes 27.3 days, covering about 13 degrees each day. By the time the Earth completes a full 24 hour rotation, it takes about 50 minutes for the same location on Earth to line up with the moon again.

Get STORM SURGE Smart!

You gotta notice the MOON.

You gotta notice the TIDES.

You gotta be prepared if the waters RISE.

As the MOON moves, it pulls the water, too;

Making highest Tides at FULL and NEW.

TIDE CHARTS, FORECASTS, LANDMARKS, APPS –

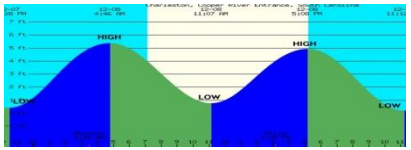
Gotta check them out

So you don't get TRAPPED!

Storm Surge: The Big Bad FIVE

FULL or NEW MOON

HIGH TIDE



STRONG OFFSHORE WIND

Rain Bomb

A FILLED AND PAVED WETLAND (Wetlands store storm water.)

Tide Chart App Checking Is KEY!!! Many are region specific like this one.