

Planning for the tide!



So you are planning a nice weekend by the coast and have your heart set on an award winning image of wave cut platforms at dawn. The trouble is that there may only be one or two days in the whole year when the image you have in mind is possible! In order to ensure that your trip is a success (not to mention the safety factors involved) you need to gain a working knowledge of both tide times and the speed/direction of change in water level, as well as sunrise times and the bearing on which the sun will rise on any day of the year.

Tides are mainly caused by the effect of gravity - particularly from the moon and the sun and partly by local topography and specific environmental conditions at any particular location. If you can picture the whole globe in your mind, you need to imagine the "bulge" of water at high tide, the peak of which occurs at points nearest to and farthest away from the gravitational attraction. Conversely the "trough" in the surface water or low tide appears at points at 90 degrees to the gravitational attraction.

The earth rotates beneath this "ellipse" of water and consequently the tides appear to move around the coast. The earth spins around relative to the moon once each lunar day which takes approximately 24 hours and 52 minutes and this results in the tides varying at any location by roughly 52 minutes each day.

So if we arrive at our location exactly at high tide, the water levels will recede for roughly 6 hours and 13 minutes (the period known as ebb tide) until low tide is reached. The water will then rise for 6 hours and 13 minutes (known as flood tide) until the next high tide is reached.

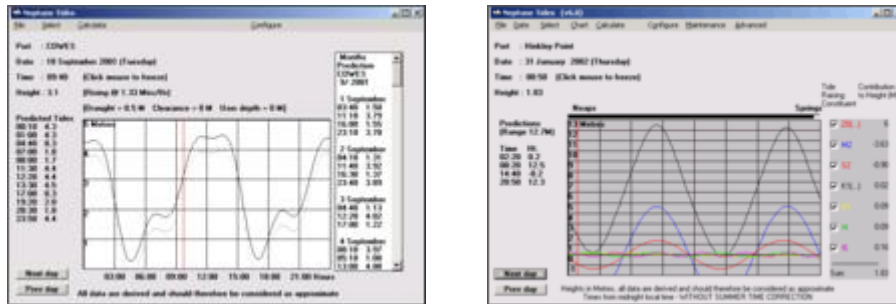
The moon is approximately 240,000 miles from the earth and accounts for approximately 56% of the tidal effects we see. Although the sun is 93 million miles away, it accounts for most of the other 44% because it is of far greater mass. The direction of gravitational attraction is therefore shared between sun and moon, and when they are both "pulling" in the same direction, the effect is greater. This increased gravitational effect results in a much bigger variance in height between high and low tides and is commonly known as a "Spring Tide". (note: this has nothing to do with Spring the season). Conversely when the sun and moon are pulling at odds with one another, the tidal effect is weakened and the variance in tide heights is smaller. This is known as a "Neap Tide". These variances can be significant with regard to our dream picture mentioned above. For example on a recent trip to The Gower Peninsula, I noted that at the beginning of the week, low tide was 0.6 metres and high tide was 9.4 metres. By the end of the week low tide was 3.0 metres and high tide just 7.2 metres. Within 7 days, the water level at it's lowest had changed by 2.4 metres (almost 8 feet!!!). One other point to note is that during the spring tide the water level changed by 8.8 metres (over 28 feet) all within a little over 6 hours. The rate at which the water level changes is not uniform - it tends to slow down around the high and low water levels. As a rule of thumb it is useful to assume that in each of the six hours between high and low tide, the water level will change by the following fractions 1/12, 1/6, 1/4, 1/4, 1/6, 1/12. This means that of the 8.8 metres change on the Gower, almost 2.2 metres change happened in hours 3 and 4. That's 14 feet in 120 minutes!!!! It's easy to see why people get trapped by an incoming tide!

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So back to our dream image. We need the tide to be out as far as possible at dawn - or at least we want it to be mostly out and still going out (to give us a good chance of not getting trapped by rising water during our photographic reverie). Now it is clear that the tide is only low at one time during any 12 hour period and that this time varies by 52 minutes a day. Consequently there may be only one or two consecutive days a fortnight when low tide coincides roughly with the sunrise - not good odds if we leave it to chance! But don't panic there is a solution. A quick search on Google using the search string Tide Times will return a number of products for sale that can accurately predict all this information at any location for hundreds of years (these usually include sunrise/sunset times and phases of the moon). A few pounds invested will purchase a tool that will run on your PC, laptop, Palm PC or even mobile phone! - and could save a number of wasted trips to the coast very quickly. Personally I use a product called "Neptune Tides".



So we've purchased our software and can be sure that the water levels will be perfect for our dream image, but what about the sun? Well that's easy surely - as every child knows, the sun "rises in the east and sets in the west". This is certainly true - at the equator! - but at our latitude there is a big variation in the bearing to sunrise depending on the time of year. In order to ensure that the light for our wonder image is coming from the right direction, we need to consider the following. On the longest day (21st June) the sun will rise almost in the North East and set in the North West. On the shortest day (21st December) it will rise in the South East and set in the South West. That's 90 degrees of difference between summer and winter for both sunrise and sunset!! Obviously this is the maximum variation and at any date in between the variation will be less. So at a point half way between the longest and shortest days, the sun will indeed rise in the east and set in the west.

This fact can be very useful to us as photographers. Let's imagine that our dream location sits in a small rocky cove on the south coast of Wales. During the summer, the sun will rise and set over the land and may not reach down in to our little cove until sometime after sunrise. In mid-winter, however, it may well rise over the sea and shine perfect, warm, dawn light on to our fantastic rock formations..bliss..

So now we can find the correct time of year, use our Tides software to predict the best days of the month and all we need is fine weather, clear skies at dawn, hope that no-one has left footprints all over the sand, find a decent B&B etc. etc. etc.