HASTINGS PIER CHARITY

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Hastings Tides

Low tide at Hastings Pier, (HPC014.087)

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Hastings Tides

Tides and Moon Phases

The Moon travels around the Earth in elliptical Orbits of 27 days, 7 hours and 43 minutes. However, each Lunar Month (from one New Moon to the next) lasts 29 and a half days. The Lunar Month is longer because the Earth itself is orbiting the Sun.

The Moon rises in the East and Sets in the West. Tides are caused by the influence of the Moon's Gravitational field on that of the Earth. Highest tides are called 'Spring' Tides as they occur during the Full and New Moon. Quarter Moons result in 'Neap' Tides which are lower.

The difference in height between the Low Tide and the High Tide is called the 'Tidal Range.' At High and Low tide there is slack water but between them there is a current of water. The incoming tide is the 'Flood' Tide and the falling tide is the 'Ebb' Tide.

BATHYMETRY involves study of the shape of the coast and of the sea bed and the position and form of landmasses as they affect the flow of seawater. A significant fact in the momentum and behaviour of tides is that the seas are much shallower in depth than they are broad in extent. The rise and fall of tides are also influenced by the currents in the sea.

NAUTICAL CHARTS are important for mariners judging conditions during voyages where tidal influences interact with local currents and Bathymetry.

The Direction of Waves in Relation to Long-Shore Drift.

Waves approach the shore obliquely from the southwest, the direction from which blows the prevailing wind. As waves fall back along the beach (backwash) after breaking they drag shingle and sand back down, but after it has been moved slightly eastwards by the incoming sea. So, over time the effect is to transport shingle and sand eastwards. This is a major reason for beach replenishment as areas to the west become denuded of shingle.

Hastings beach and Pier 2015 (HPC100.048)

How far back does the tide go at low tide?
Local people refer to ‘short’ and ‘long’ tides. The extent to which the sea goes out and the height to which it returns are dependent on the tides. Very low tides expose lots of sand mud and some rock ledges whilst at high tide sea water covers the beach except for the shingle covered upper reaches.

Tide Timetables
Tide tables are printed in the weekly local newspapers and especially made tables for the whole year are available in local shops such as angling shops and newsagents along the coast. Tide tables are also given on BBC weather for locations throughout the UK.

To read the table first look up the date. It may be today or you may be planning for another day. The date is essential as a first step. Always look up the date and time as tides are different every day.
High Tide is given in meters, showing the expected height and the time using the 24-hour clock.

Low Tide is also given. There is a Low Tide between every High Tide and the height in metres is that above average low water mark. Hastings has a ‘Semidiurnal Tide’ which means that tides rise and fall twice in a day of 24 hours.

Why does the Sea Change Colour?
Water appears clear and colourless in a glass but larger quantities show a blue tinge and this is more apparent in very large water bodies such as lakes and seas. Water does not readily absorb the short-wave blue section of the colour spectrum and this means the colour is reflected. This is a chemical attribute of water as a molecule, H2O.

In addition, the phenomenon of **RAYLEIGH SCATTERING** means that over long views blue is more apparent to the human eye. Water surfaces are reflective of the sky and as the sky also has a blue colour this adds to the blue appearance of the sea. If the sky is white or grey with clouds this too will be reflected on the surface as will red or pink sunsets and dawns.

If the sea contains organic particles these will influence colours and shadings as well, producing green and brown tints which react to the angle of the sun and condition of the sky. Air temperature and atmospheric pressure on any day will also influence the refraction of light. Sea colour and shade is constantly changing in response to these environmental influences.

What is Sea Water Made up of?
Sea water is salt water and actually a complex mixture of materials suspended in solution. 96.5% of seawater is water itself, H2O. 2.5% is comprised of salts, and there are also organic and inorganic particles along with some gases from the air. Seawater is a vital source of Magnesium and also Bromine and Table Salt (sodium chloride) is extracted from sea water by evaporation. Drinking water is also supplied by desalination plants in some regions where freshwater is in short supply.

The sea salts are Ions of the following: - chlorine, sulphate, calcium, sodium, magnesium, potassium.

An aerial image of Hastings Pier during the reconstruction in 2015 (HPC100.035)

Other important inorganic constituents are carbon, bromide, boron, strontium and fluoride. The inorganic materials in seawater are foundational for life in the sea and therefore too of life on Earth.

Gases from the atmosphere are dissolved in seawater to some extent; - nitrogen, oxygen, argon and carbon dioxide.

Important organic constituents of the sea are carbohydrates, amino acids and particulates which are suspended in the upper 100 meters of the sea where dissolved carbon is transformed by photosynthesis into organic materials. 24 hour DIEL CYCLES of photochemical and photosynthetic transformations convert dissolved organic carbon. Essential trace elements are also involved in the transformation between organic and inorganic processes, with their role and frequencies far from random.

These materials create a viscosity and higher density to seawater and also lower the freezing point and raise the boiling point of sea water.

The great sea bodies are fed by rivers and also by hydrothermal vents from fissures in the sea bed. Physical mixing by wind and temperatures balance out the effects of the local inputs so that seas water has a particular character throughout the seas.

Inorganic phosphorus and nitrogen are necessary for sea life. As organic debris drops down to the sea floor a chemical balance is retained through the cycling of chemicals. Carbon dioxide influences the level of acidity in the sea while shell formation and dissolution is a part of the cycle of the biosphere.

The sea supports both phytoplankton and zooplankton, the foundation of the sea ecosystems and of photosynthesis maintaining the balance of chemicals in our atmosphere.