Lesson 1

Coastal deposition: mudflats and saltmarsh at Keyhaven

Introduction



Coastal deposition occurs when sediment suspended in the water settles on the seabed. Commonly, this happens in calm, sheltered water protected from waves and currents. This explains why a large amount of mud has settled to form mudflats and saltmarsh at Keyhaven in the shelter of Hurst Spit.

Mudflats are exposed only at low tide. They may have some vegetation cover but are often bare expanses of mud, popular feeding grounds for wading birds. As more mud is deposited, mudflats rise above sea level to form new land. These marshy wetlands are saltmarshes.

In this activity, you will use OS maps and GIS to investigate the mudflats and saltmarshes at Keyhaven.

1. **The maps below show the Keyhaven area in the 1890s (left) and the present-day (right). On the 1890s map:**

   (a) Use a colour or highlight pen to draw around the edge of Hurst Spit, including the recurved tips.
   (b) Now use a colour to shade and label the mudflats and saltmarshes (Keyhaven Marshes and Pennington Marshes).





Look at the present-day OS 1:50,000 map of the area. Notice the bold black line which indicates the high tide line. This marks an earth embankment that protects Keyhaven and the low-lying land from flooding.

(c) Use a pencil or highlight pen to draw and label the line of the embankment (the high tide line) onto the 1890s map.

Notice that the raised embankment now separates Keyhaven and Pennington Marshes from the sea. No longer supplied with mud and permanently above sea level, the marshes have dried out to form new land.

(d) Describe how the area of mudflats and saltmarsh has changed between the 1890s and the present-day.

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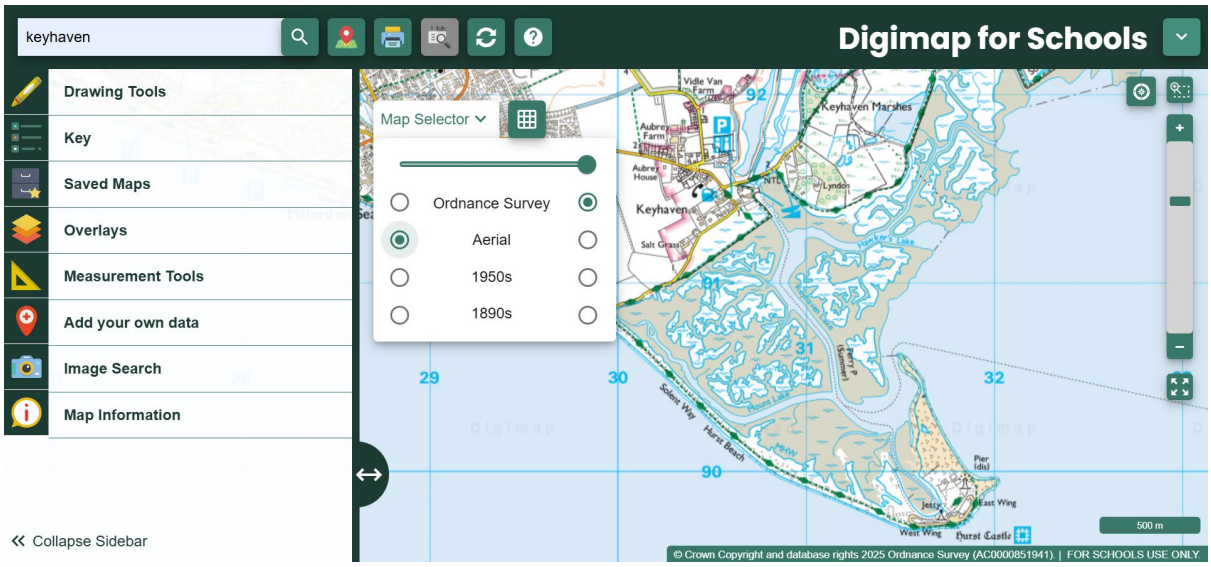
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Use GIS to further investigate the mudflats and saltmarshes. Access Digimap for Schools https://digimapforschools.edina.ac.uk/ . *[This is a free service available to schools]*

- Use the search bar to find a map of Keyhaven (Hampshire). Locate the village of Keyhaven, Hurst Spit and the areas of coastal deposition.
- Take a few minutes to explore the site and the various tools.
- Click Map Selector to reveal several options. Notice that you can use the fade bar to switch between two selected options, such as '1950s' and 'Ordnance Survey'.
- Zoom to show the OS 1:25,000 and set the Map Selector for 'Aerial' and 'Ordnance Survey' (see below).



2. Close the map selector to give you a full view of the 1:25,000 map.
   (a) Use the measurement tool to measure the length of Hurst Spit from the footbridge (FB) at 299908 to Hurst Castle. _____

(b) Now measure the length of the latest recurved tip starting at Hurst Castle. _____

(c) Measure the area of coastal deposition (mudflats and saltmarsh) behind the spit to Pennington Marshes. _____

3. Make an electronic copy of the 1:25,000 map on a Word document.
   Locate and label the following:
   - Hurst Spit
   - Recurved tip
   - Flood embankment
   - Present-day mudflats and saltmarsh

4. Use the fade in Map Selector to reveal the aerial photo of the area. Now make a copy of this image and add labels to pick out the main features of coastal deposition.

- Fade back to the OS 1:25,000 map and zoom in to investigate Keyhaven and Pennington Marshes. Remember that in the 1890s, these areas were exposed to the sea. Since the construction of the embankment, they have been better protected from the sea.



5. On a copy of the map, locate and label the different land uses that illustrate how these former saltmarshes have changed since the embankment was built. You may need to refer to a symbols key which you can access at https://www.ordnancesurvey.co.uk/mapzone/assets/doc/Explorer-25k-Legend-en.pdf .