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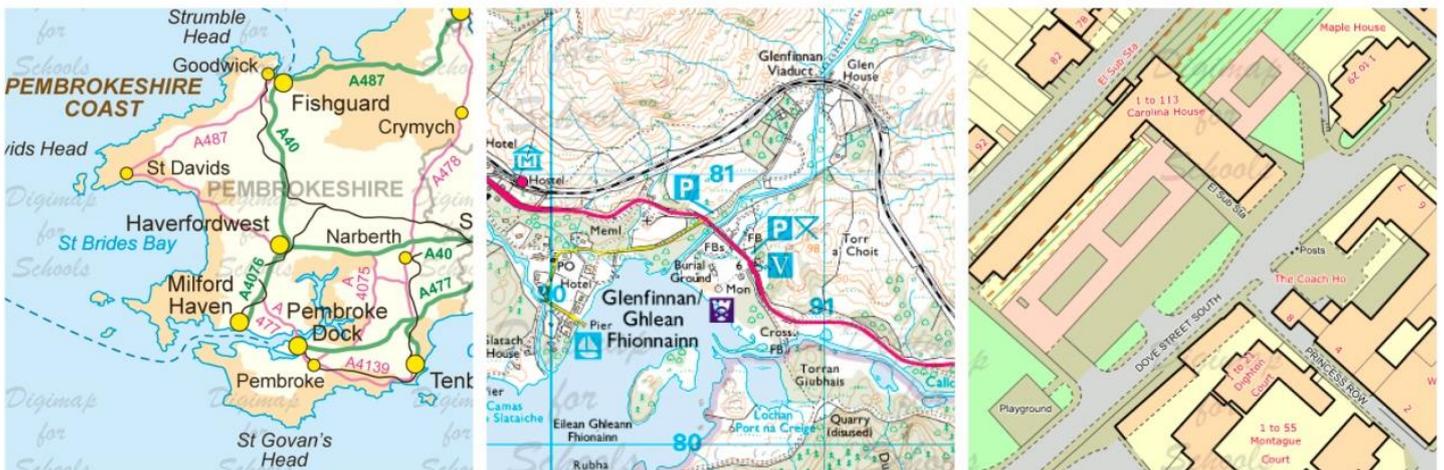
Identifying Changes to Coastal Spits

Exploring coastal processes and landforms

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Geography teaching resource

Secondary



This is one of a series of teaching resources for use with Digimap for Schools. For more details about this service, visit <http://digimapforschools.edina.ac.uk>

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Digimap for Schools Geography Resources

Title: Identifying Changes to Coastal Spits

Level	Context	Location
Secondary	Exploring coastal processes and landforms	Example is Spurn Point but other locations are suggested from around Britain. Teachers and students could use their own, perhaps associated with field work or already chosen case studies.

Knowledge	Mapping. Grid references. Labelling. Measuring. Background knowledge about beach features, longshore drift and spit formation.
Curriculum Links England	Aim: .."interpret a range of sources of geographical information, including maps". "...understand through the use of detailed place-based exemplars at a variety of scales the key processes in coasts" "...understand how human and physical processes interact to influence and change landscapes.
Scottish Curriculum for Excellence	One of the three geography units is, "Physical Environments" "Learning experiences will enable learners to develop a wide range of transferable skills including interpreting geographical phenomena, usingmaps"
Curriculum Links Wales	"..learners to explore by investigation the diversity of the natural and human landscapes in Wales" "...extend their locational knowledge and understanding of how processes shape both natural and human landscapes"

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Activity

This activity refers to dynamic coastal features and attempts to identify and measure change.

There can be confusion over the connection between processes of landscape change, (both erosion and deposition) change events, and persistence of features. The rapid and regular changes experienced on a beach, with each tide, is unique. The human lifetime is long enough for very minor features to be created or modified, though at a given point in time, major changes can occur, suddenly, and dramatically.

The areal extent of landforms creates another issue. What would students expect to be able to identify and measure on a map? Local knowledge and fieldwork help to give a context. When trying to identify change in historical time, remember that negative results are a result.

Introduction

Coastal spits are major beach structures associated with longshore drifting. They are dynamic coastal landforms with associated features. Each is unique but, around the British coastline, they routinely have curved ends. As water collects behind a spit, a depositional area can form leading to saltmarsh growth. Winds may deposit sand and coarser material to create dune systems.

The spit itself, the marsh and dunes are all subject to change in orientation and size. Daily tidal inundation as well as winter storms can effect change.

Main activity

A qualitative and quantitative set of tasks to investigate change to spits. This is based on Spurn Point on the North Sea coast of Yorkshire. Suggested alternative locations are listed below. When you first locate a spit, slide slowly between the modern and historic map to get an idea of the direction, extent and nature of any change.

- Hurst Castle
- Whiteness Head
- Fairbourne (Gwynedd)
- Dungeness
- Sunderland Point
- Dawlish Warren
- Orford Ness Sandbanks
- Culbin Forrest

Taking it further

Human use and modification of spits has changed over time. Look particularly at groynes and evidence of economic activity as themes for comparison.

Web links

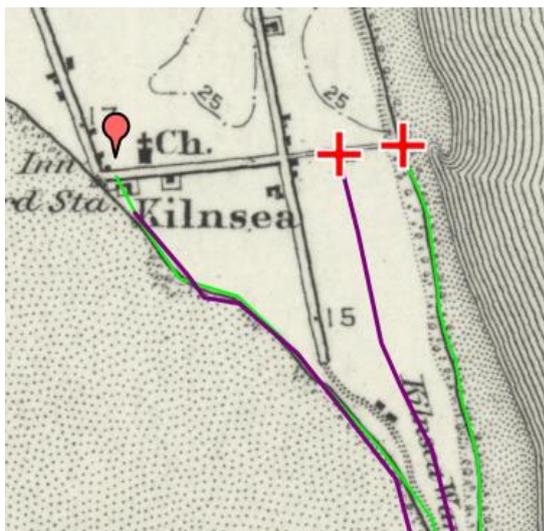
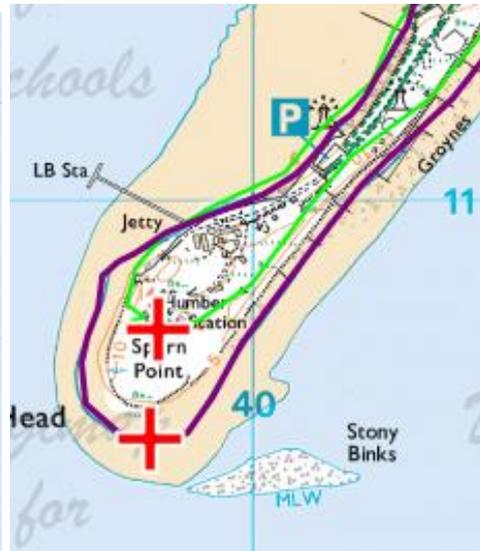
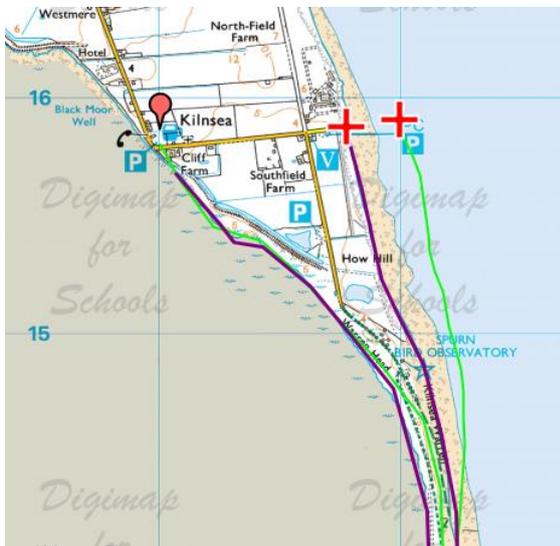
- www.metoffice.gov.uk/news/releases/archive/2014/early-winter-stats
- www.nationaltrust.org.uk/article-1355824158683/
- BBC Class Clips no.3086
- www.bbc.co.uk/england/sevenwonders/yorkshire/spurn/

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Example results

Changes at Kilnsea and at Spurn Point



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Changes to Spits

Open Digimap for Schools and enter Spurn Head in the search box.

Use the slider to view the 1890s map and the modern map together. Notice the change in size and shape of the spit. Track north along the spit up to Kilnsea and you will see more differences. You are going to investigate and measure some of these changes.

1. Place a red marker at Kilnsea near the Inn. 
2. Choose either the modern or the old map to work on first and select an outline colour that will contrast, e.g. bright green.
3. If you are using the modern map identify the Mean High Water line in blue. If you are using the 1890s map look for the solid black line. You are going to trace along these lines.
4. Starting at Kilnsea carefully draw along the coastline all the way to Spurn head and back up to Kilnsea. (As you draw your line will be blue, but when you double click it will turn to the colour you have chosen). **TIP** – this is a long line to draw so you can do it in sections, just double click at any point and then start again where you left off.
5. When you have finished on one map, choose another line colour and do it again on the other map.
6. Look at Spurn head itself and put a  on the most southerly point.
7. Find the end of the spit on the historic map and do the same.
8. Using the line measuring tool,  measure the actual distance between the centre of each red cross. Note the measurement. You could add this as a label on the map if you wish.
9. Now work your way back up the spit and see if you can find anywhere the difference between the two lines is just as big or greater. Highlight any places you want to measure with red crosses in the same way.
10. Spits will vary but they will often have features such as sand dunes and marshes, see if you can see these. Look for other changes that have taken place to these over time and mark them with another symbol. If there is change write why you think this has taken place.
11. Can any conclusions be drawn from your investigation? Has there been measurable change in the last 125 years?
12. If you were looking at a map made 125 years from now what further change do you think you might see? Give your reasons.

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Hurst Castle Activity

Open Digimap for Schools and enter Hurst Castle in the search box.

1. Locate Hurst Castle, what is its grid reference number (use the add grid lines tool)



2. Hurst Castle is built at the end of Hurst Spit, a famous geomorphological feature. How many spit recurves are there? What is Hurst Spit made of? Use the Geograph tool (search Spit) to look at photos.



3. How far from the Sturt Pond car park would you need to walk along the footpath before you reached the castle?
4. What other modes of transport can you use to reach the castle? Where do you depart from?
5. What other features and buildings are near the castle?
6. What habitats can you see in the surrounding area?
7. Use the Geograph tool to find out what animal you might find right at the end of Hurst Spit
8. If you were stood next to the East Wing of the castle, how far is it to the Isle of Wight?
9. Why do you think the Castle and other buildings were built here?
10. Are there any sea defences to protect the castle from erosion?
11. Can you notice any changes in the position of Hurst Spit? Place a marker or line along the midpoint of the spit (the path is located along the top), and annotate it as 'Present Position', then use the slider tool to turn on the historical maps. If you were standing by the marker or line in the 1890's would you be stood on beach or on something else? Which direction has the beach moved? Why do you think it has moved?
12. Can you see any other changes between the 'Today' and '1890's' maps? Move the slider so you can see both layers at the same time. Interesting areas include:
 - The size of Sturt Pond
 - Saltmarsh area sheltered behind Hurst Spit
 - The length of the recurve features
 - Position of the saltmarsh and river channels
 - Buildings and settlement
 - Position and orientation of Hurst Spit

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13. From your investigation, do you think that there has been a lot of change since the 1890's?
14. Do you think there will be more change over the next 100 years?

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