Gwithian Towans: from tin sand to nature conservation

1. Look at the photo and the map extract.

a. What is the evidence that mining waste has been flushed into the sea?

b. What is the name of the river that flows to the coast at Gwithian Towans?

c. The photo shows the beach at Godrevy, just north of Gwithian Towans. Give the four-figure grid reference for this beach.

d. Use a label to locate Godrevy Point on the photo.

e. Using evidence from the map, suggest why the contamination of the beach is greatest in the bottom left corner of the photo.



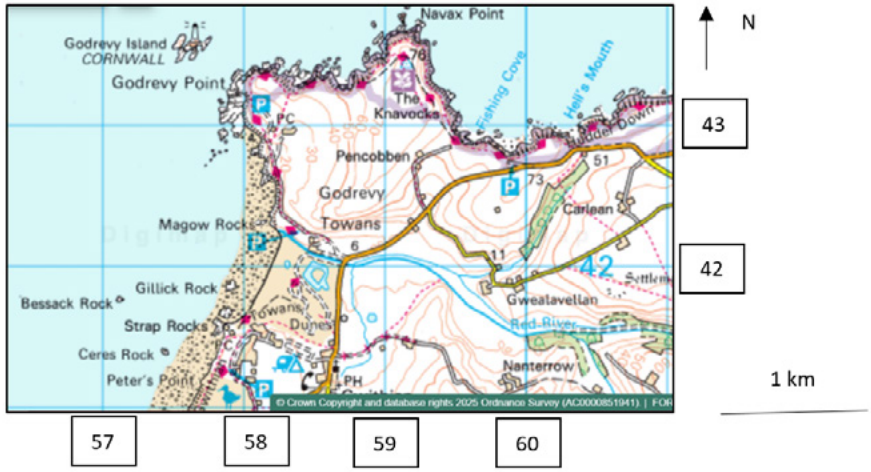


Photo: Cornish Story
http://cornishstory.com/2020/11/30/gwithian-tin-sand-works-part-two-processes-and-people/

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2.

Cornish Sands Ltd began to extract tin sand from the beach in 1913. Horse and cart were used to transport the sand to the nearby tin sand works. Soon an aerial ropeway was constructed, replacing the horse and carts. The tin works closed in 19xx



Photo: CornwallLive www.cornwalllive.com/news/cornwall-news/gallery/history-100-year-old-cart-5001747

The photo above shows the discovery made in the cliff face in 2022.

a. Label the old cart in the photo.

b. What do you think the structures at X might be?

c. What evidence would you look for in the cart to confirm what it transported?



Photo: Cornish Story http://cornishstory.com/2020/11/30/gwithian-tin-sand-works-part-two-processes-and-people/

The photo below shows the aerial ropeway used to transport tin sand from the beach.

a. Why was the aerial ropeway more efficient in transporting tin sand than horse and cart?

b. Suggest the likely impacts of the aerial ropeway and the quarrying of tin sand on the sand dunes.

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The OS map extract above dates to the 1950s. It shows the tin works constructed on the bank of the Red River. It also shows the rail lines used to transport the sand across the dunes to the works.

a. Locate and label the tin works.

b. Locate and label the tramlines.

c. Suggest why the tin sands works was located alongside the river (hint: think about the power source).

Gwithian Towans: constructing the lagoon for nature



Following the closure of the tin works in [19xx], sand continued to be extracted from the nearby sand dunes. Rich in calcium carbonate (from shells), the sand was used in agriculture and, later, in the reconstruction of Plymouth after the bombing of World War 2. When quarrying stopped, Cornwall County Council created a lagoon to restore the ecology of the area. The lagoon is now part of a local nature reserve.

Reedbeds in the lagoon are valuable habitat for nesting birds and burrowing habitats for voles, mice and otters. Rushes at the edges of the lagoon also provide important habitats for birds and animals.

The 1:25,000 map extract shows the lagoon at St Gothian Sands.

a. Locate and label the Red River and the old tin works.

b. Describe the shape of the lagoon.

c. What symbol indicates that this area is a nature reserve?

d. Use the 1:25,000 map key (https://www.ordnancesurvey.co.uk/mapzone/assets/doc/Explorer-25k-Legend-en.pdf) to identify the vegetation around the lagoon.

e. Using evidence from the 1:25,000 map, describe for the wide range of natural environments supporting wildlife in the area. [lagoon, bracken/heath/rough grassland, scrub, beach, sand dunes, etc]

Gwithian Towans: GIS activity

3. The following GIS and OS map skills activities make use of Digimap for Schools (https://digimapforschools.edina.ac.uk/roam/map/schools) which is freely available to schools.

- Create an account and log in to Digimap for Schools
- Locate Gwithian Towans using the interactive map or by searching for nearby Hayle
- Take some time to explore the tools and options. Look at the other maps/ images available (Map Selector) – try out the excellent fade option to enable you to compare two images. Zoom-in to look at the beach in greater detail.

Click Map Selector. Click the buttons for Aerial (left) and Ordnance Survey (right). Now drag the fade bar at the top to fade between the two images.

a. Was the aerial photo taken at high tide or low tide?

b. Describe the land use at 560385.



Now click the buttons for 1950s (left) and Ordnance Survey (right). Fade between the two maps and focus on the high tide line which marks the upper edge of the beach. Using the gridlines, assess whether the beach has been affected by accretion (enlarged), erosion (reduced) or whether it has remained much the same.

Now take a closer look at the 1890s map. Make a list of some of the industrial uses of this stretch of coast.

Gwithian Towans: GIS activity

Use internet research to find out more about the Dynamite Works, otherwise known as the National Explosives Works at Upton Towans. Here is a good link to get you started: https://war-work.com/the-national-explosives-company-limited-upton-towans/

The photo shows the remains of the works today.



Photo: https://angarrack.info/pages/190728-history-terrible-explosion-royal-navy-dynamite-factory-killed-five-and-rocked-cornwall

a. When were the works established?

b. What was the purpose of the works?

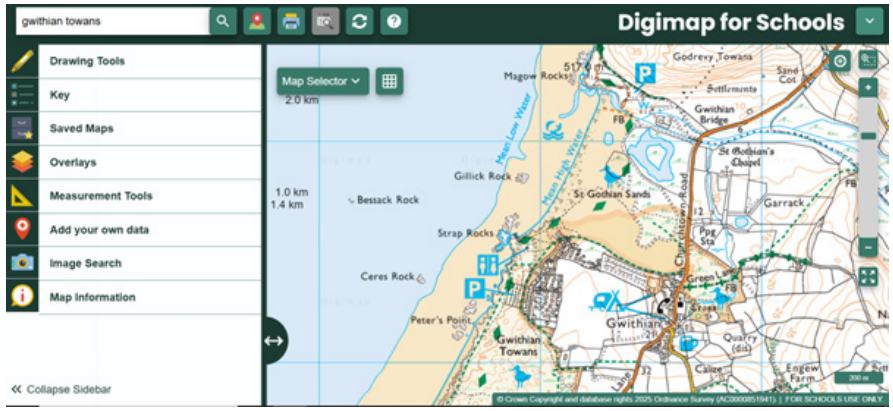
c. When did the works close?

d. How were the sand dunes modified in the construction of the works?

e. Nearby to the works was a nitric acid plant. What was the nitric acid used for?

f. What happened on January 5th 1904?

Gwithian Towans: GIS activity



Drag the map to focus on St Gothian Sands at the northern end of St Ives Bay. Zoom-in to the 1:25,000 OS map (see below).

a. Use the measuring tool to measure the width of the bay between Strap Rocks and Magow Rocks. You may need several attempts to practice! Click 'Delete measurements' to delete any mistakes. Give your answer in metres.

b. Measure the distance between Mean High Water and Mean Low Water.

c. Now attempt to measure the area of St Gothian Sands above the high tide line. Only measure the area shown orange.

The beach at Gwithian is popular with visitors. Use the 1:25,000 map extract (as shown above) and the symbols key (https://www.ordnancesurvey.co.uk/mapzone/assets/doc/Explorer-25k-Legend-en.pdf) to identify the facilities and attractions for visitors and tourists to the area.

EXTENSION ACTIVITY

Use the Map Selector options to investigate further the effects of the National Explosives works on the landscape of the sand dunes at Upton Towans. Fade between the current OS map (1:25,000) and the aerial image to see how today's landscape bears the scars of its industrial past. Capture images and add labels to support your research.