making space for sand

Lesson 2

Par Sands: changing beaches and climate change

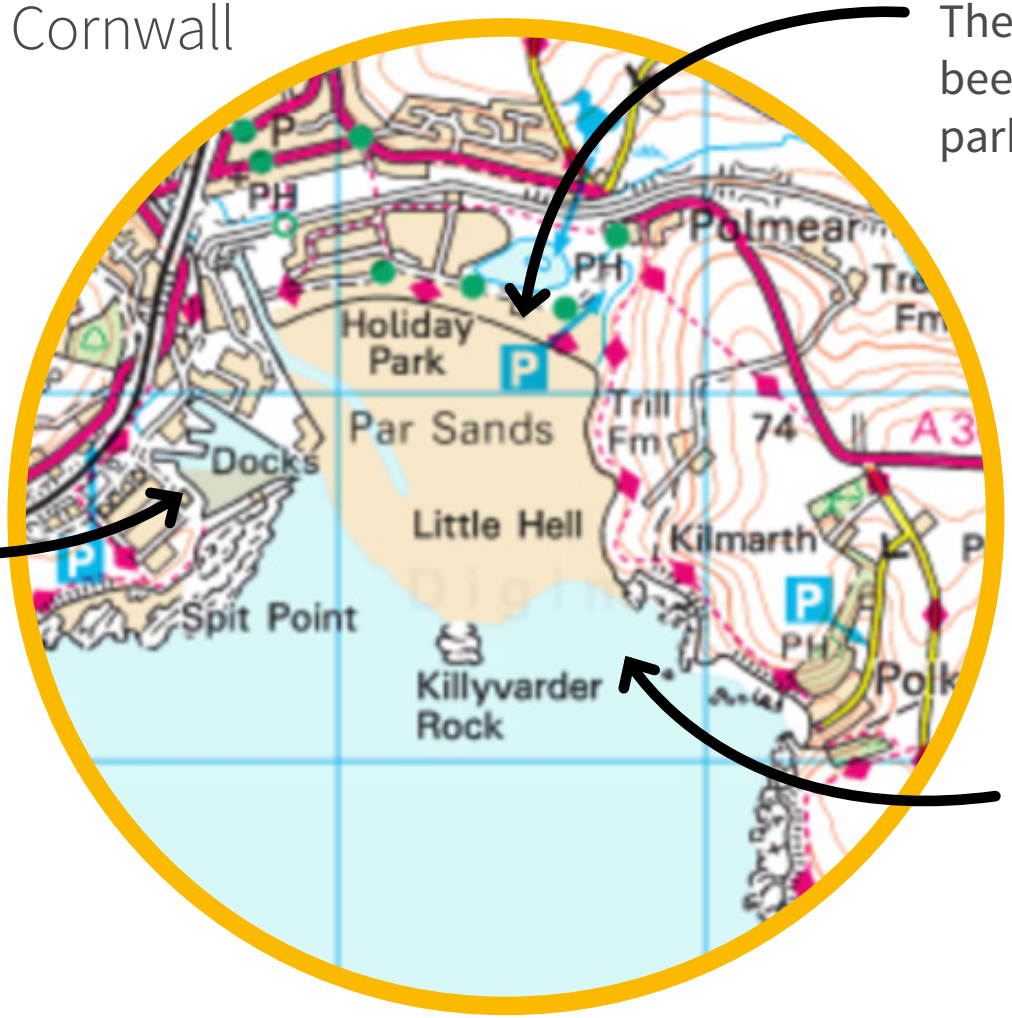


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Environment Agency
Flood and Coastal Resilience Innovation Programme
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Saltash
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Redruth
Truro
Camborne
St Ives
Falmouth
Helston
Where is Par Sands?

Par Sands: 1:50,000 map extract

Par Sands is a wide, south-facing beach, within St Austell Bay, located on the south coast of Cornwall



To the west of Par Sands is an industrial area and docks used for processing China Clay.

The older sand dunes have been developed into a car park and holiday park.

At low tide, Par Sands extends far out into the bay providing a source of sand for the dunes.


Par Sands
Google. Imagery © Airbus, Maxar Technologies, Map data © 2025

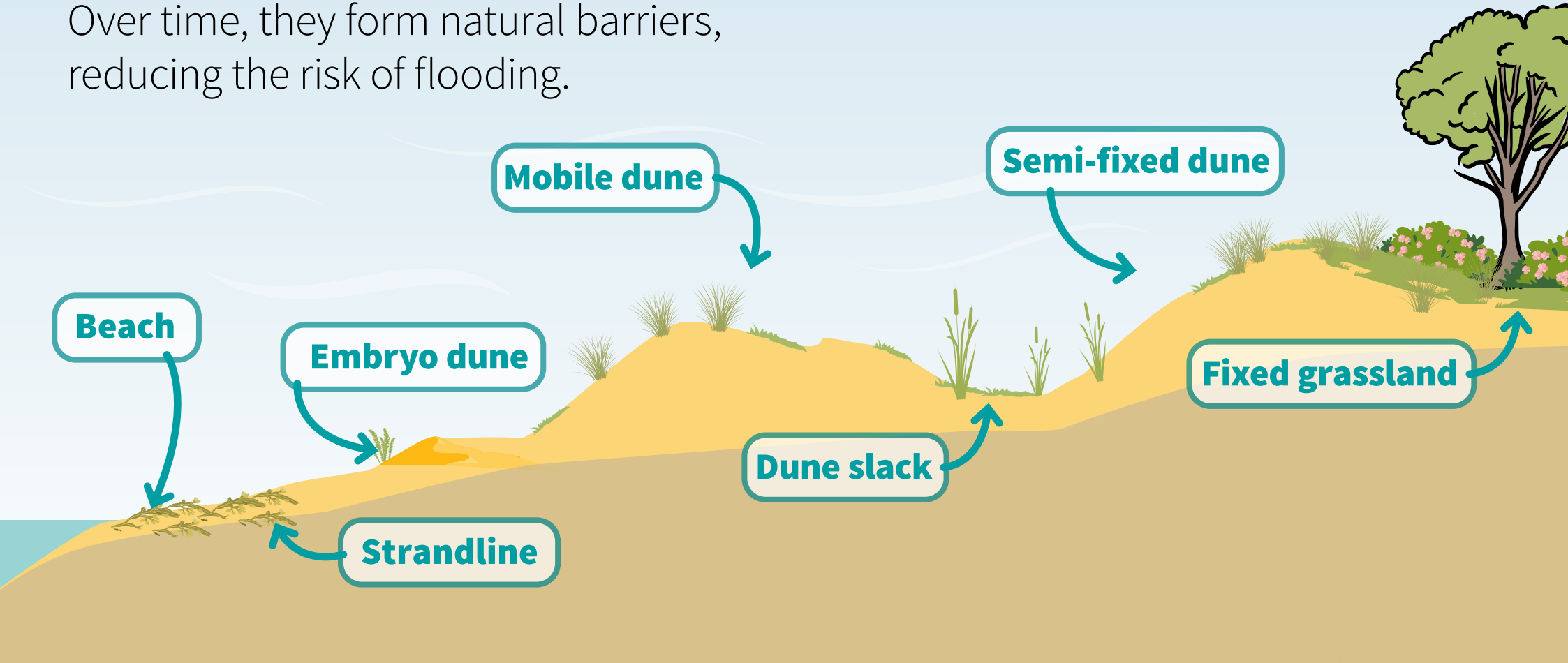

Developed zone: area of older dunes developed for car parks, holiday park, etc
Fixed zone: area of fixed vegetation that has stabilised the dunes
Mobile zone: active zone of dune building
Beach zone: area between high and low tide
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Sand dune lifecycle

Sand dunes are constantly changing landforms.

They have a lifecycle, with the youngest mobile dunes forming near the sea and the older, fixed dunes further inland.

Over time, they form natural barriers, reducing the risk of flooding.







Par Sands - a dynamic coastal landscape

Par Sands is a dynamic landform that has undergone considerable changes over the years. This photo was taken in 1938.



Can you see the sandy beach above the high tide line? This is the mobile zone where new sand dunes are forming.

Behind the mobile zone you can see the vegetation in the fixed zone.

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How has Par Sands changed?





Notice that sand has built up in the bay.
The sand dunes behind the beach have become more vegetated.

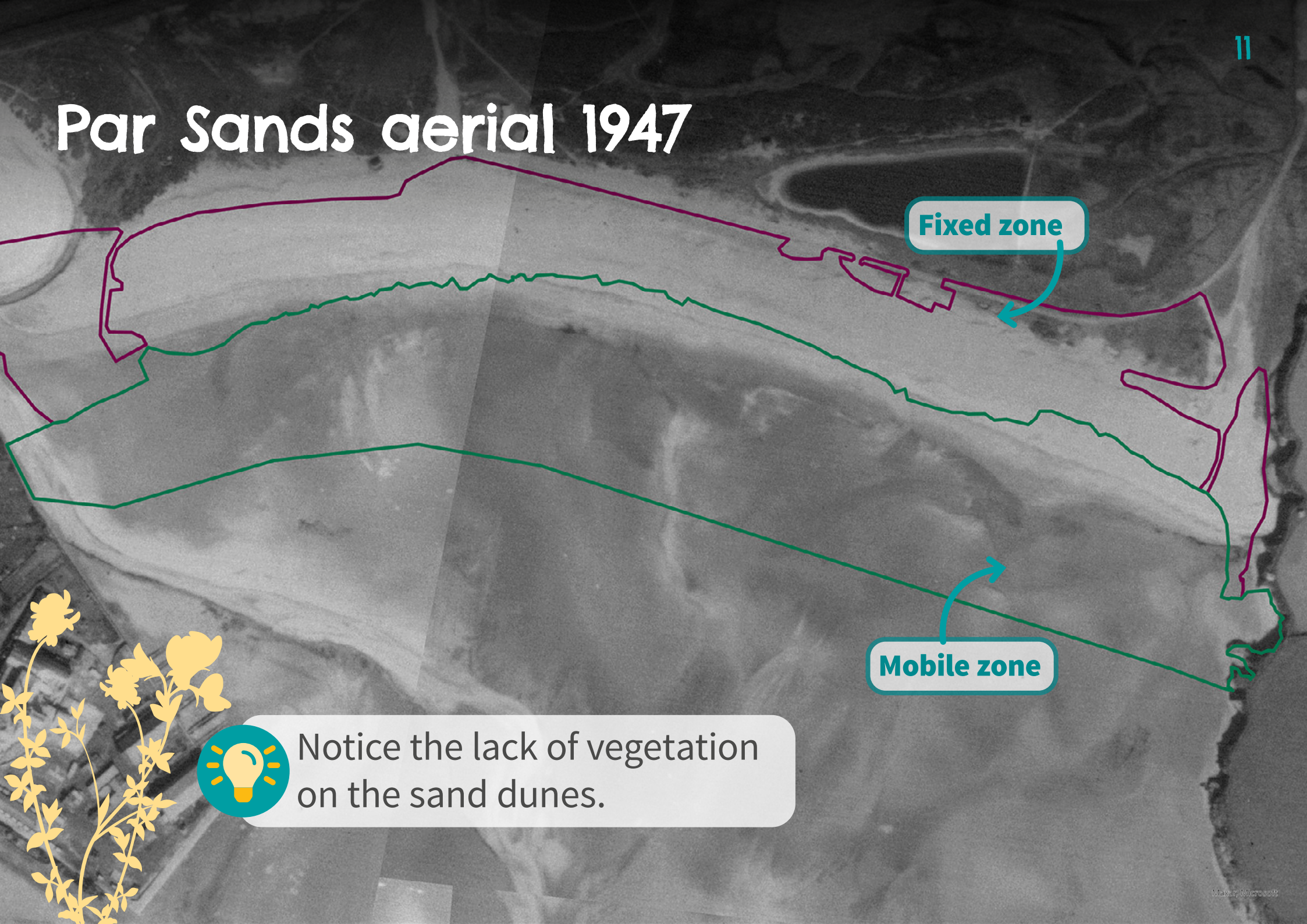
How has Par Sands changed?





Notice that continued deposition of sand has raised and enlarged the beach. The older sand dunes now have trees, and the area has been developed.

Par Sands aerial 1947



Notice the lack of vegetation on the sand dunes.

Par Sands aerial 2022

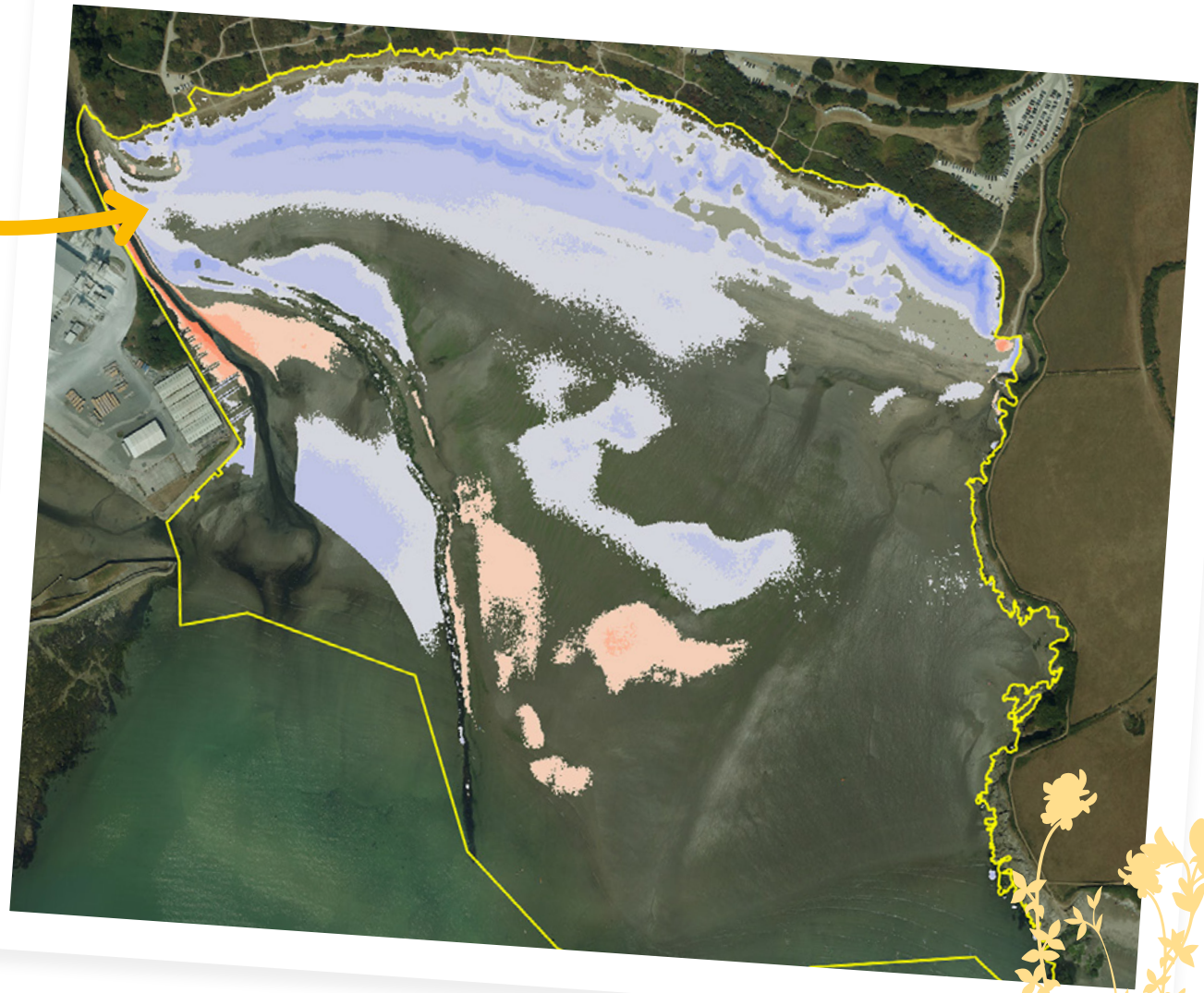


Here the sand dunes have more vegetation and you can see the development of the holiday park. Notice too how the dunes have grown seawards.

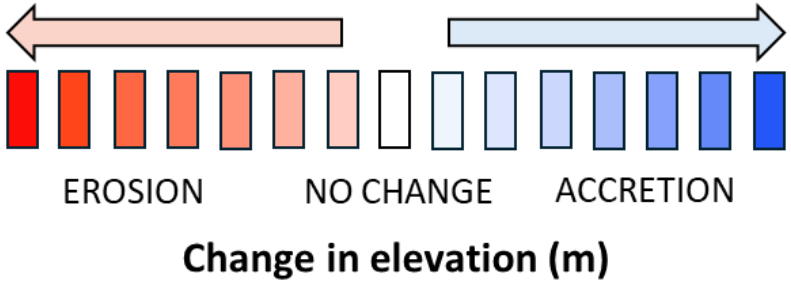
Sand deposition since 2008

Since 2008, the sand dunes have been growing in size. This is called accretion.

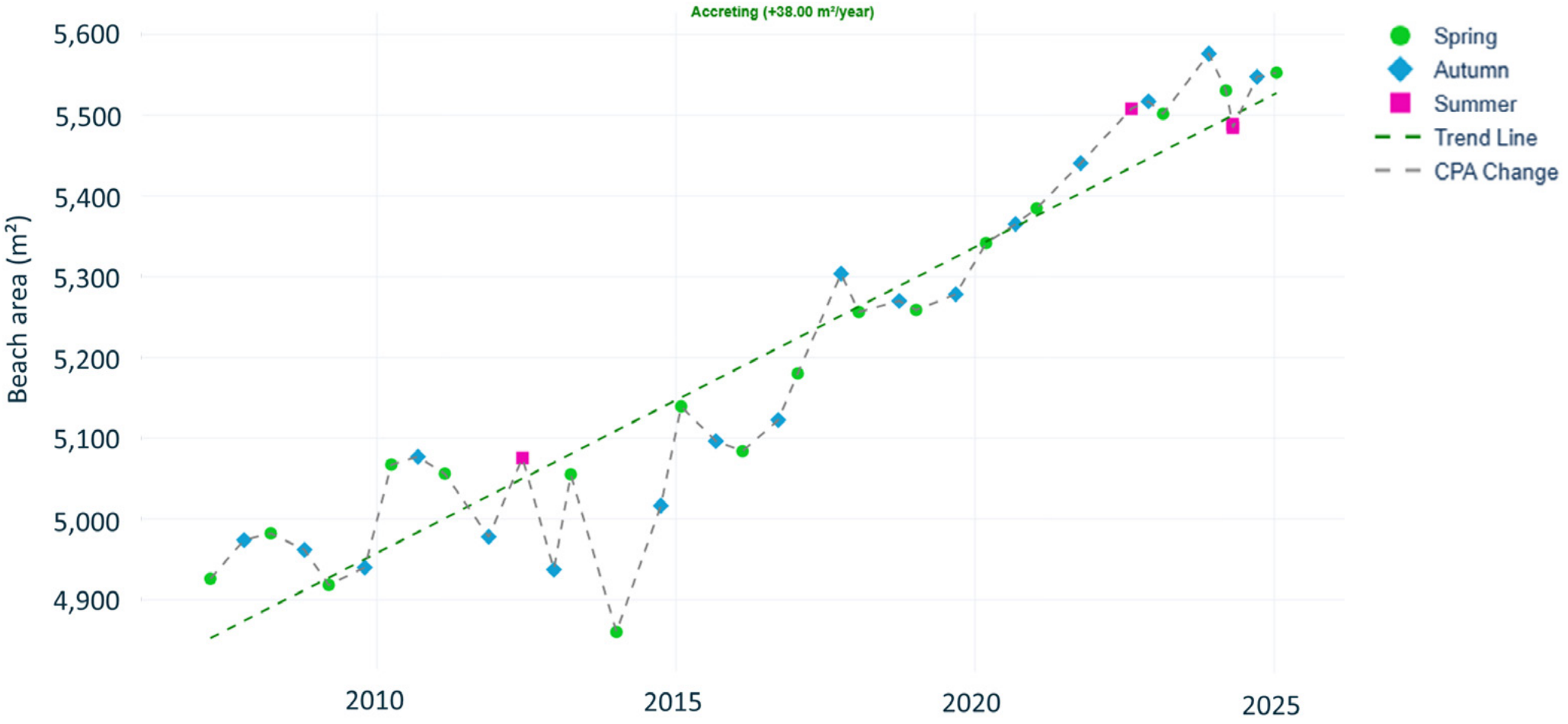
This image shows the build up of sand (shown blue) at Par Sands (2008-2022)



Key:



Increasing beach area at Par Sands



- This scattergraph plots the beach area at Par Sands surveyed in spring and autumn.
- The best-fit line shows a steady increase in area.
- On average, the rate of accretion is about 36 m^2/year.
- View dashboard **here.**

How have winter storms affected Par Sands?

Winter storms

- In 2013/14, an unusually high number of powerful storms battered the south coast of Cornwall.
- These storms had significant impacts on the beaches, eroding the beach and the face of the sand dunes.
- This loss of sand affected habitats and impacted on plants and animals.





How will sea level rise affect Par Sands?

- As sea level rises, sediment is being deposited further up the beach. This is called coastal rollback.
- By 2100, sea level change is estimated to cause the top of the beach to retreat by 61m.
- The black line plots the top of the beach in 2024. The green line plots its estimated position in 2100.



Will the beach protect the community of Par Sands from the impacts of climate change?

- Climate change threatens rising sea levels and increased storminess
- If sand deposition continues and the beach grows, it will form a protective barrier from flooding
- However, powerful storms could erode the beach making it more vulnerable to flooding

