

making space for sand

Building Community Resilience on a Dynamic Coast by Making Space for sand

An introduction to the project and its research outcomes

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Department
for Environment
Food & Rural Affairs



Environment
Agency

Flood and coastal resilience innovation programme

Part of the
Flood and coastal resilience innovation fund

This project is funded by Defra as part of the £200 million Flood and Coastal Innovation Programmes which is managed by the Environment Agency. The programmes will drive innovation in flood and coastal resilience and adaptation to a changing climate.

Content

1. Introduction to FCRIP
2. Overview of the MS4S project
3. Scientific learning and innovation



Introduction to FCRIP



What is FCRIP?



We will drive innovation in flood and coastal resilience and climate adaptation. We're investing £150 million to develop, test and implement practical and innovative resilience actions in 25 local areas.

Nature based solutions

Integrated water management

Property flood resilience

Enhanced flood warning

Community infrastructure

Local emergency response

Asset monitoring

SME disruption minimising

Community and voluntary action

- Coastal
- Catchment
- Groundwater
- Community
- Technology
- SuDS

Overview of the Making Space for Sand Project

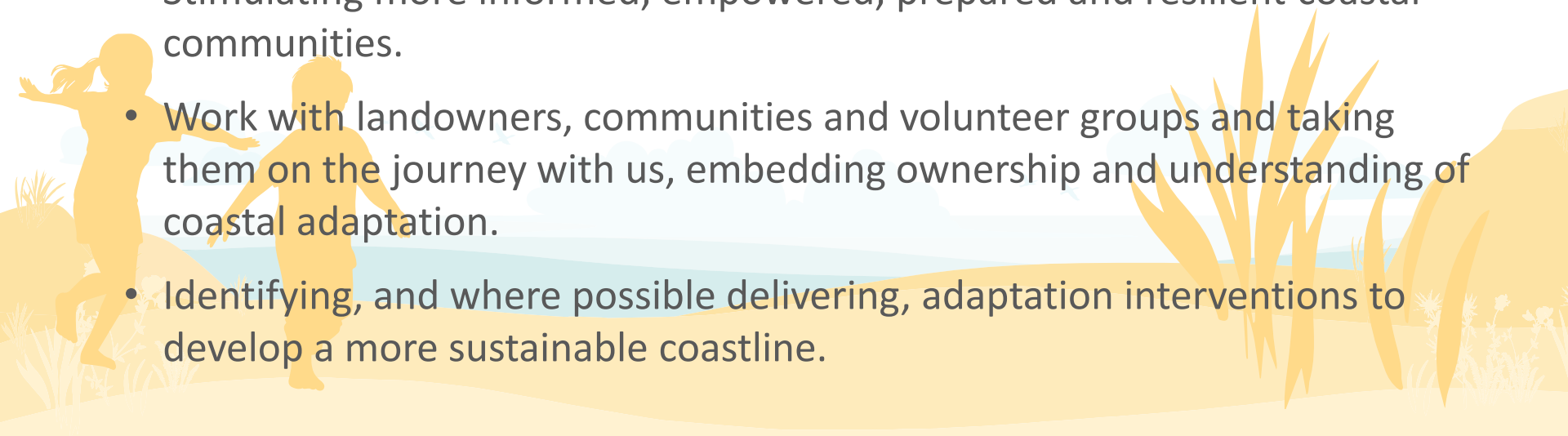


What is Making Space for Sand

The Making Space for Sand project aims to encourage the more sustainable use and development of the coastal fringe, to consider the longer term social, economic implications of coastal change.

This will be achieved by:

- Using science to better understand coastal change in response to rising sea levels and storm events.
- Maintaining and restoring healthy, biodiverse coastal dunes systems.
- Stimulating more informed, empowered, prepared and resilient coastal communities.
- Work with landowners, communities and volunteer groups and taking them on the journey with us, embedding ownership and understanding of coastal adaptation.
- Identifying, and where possible delivering, adaptation interventions to develop a more sustainable coastline.



Who Is MS4S (Partnership)?



- Project lead
- Visualisations & Exhibition space
- Co-ordinating adaption interventions

- Data collection, storage and interpretation
- CoastSnap
- Website host



- Data collection
- process modelling
- Geomorphological learning

- Ecological surveys
- Beach Dune Management Plans
- Community empowerment (Your Shore Network)



- Community empowerment
- Action & Adaptation Plans
- MS4S short film

Where is it being delivered?



Example of Outcomes

Current Situation

Information Classification: CONTROLLED

2020



2050: Based on a 'Do Nothing Scenario'

Information Classification: CONTROLLED

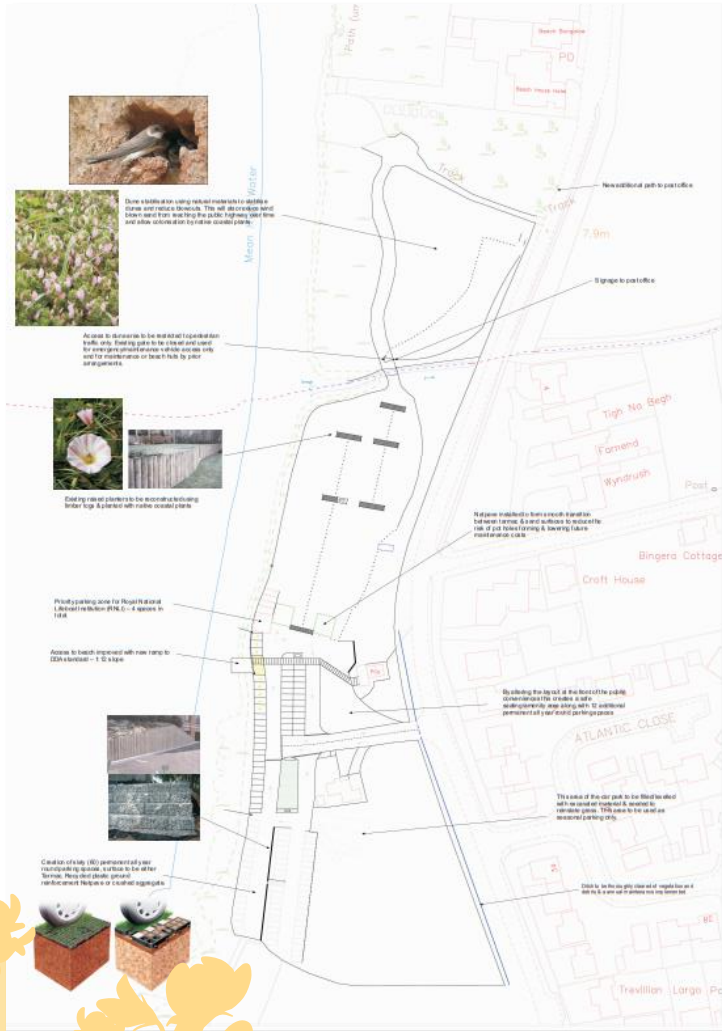
2050s



Friends of Par Beach



Potential Adaptation Interventions



The aerial photograph shows the site with several red dots and arrows pointing to specific areas. The text boxes describe the following interventions:

- Close beach carpark and allow natural sand accumulation in area.**
- Provide barriers to restrict vehicular access onto the beach and limit sand and water ingress onto highway.**
- Work with visitor centre to secure alternative location.**
- Use space to provide community infrastructure and space for vulnerable community buildings.**
- Work with RNLI, Surf Lifesaving Club and local landowners to secure alternative location for club building.**
- Move permanent trade pitches from river edge to alternative location.**
- Work with community in lower lying area to develop flood resilience.**



Scientific Learning and Innovation



Background - motivation

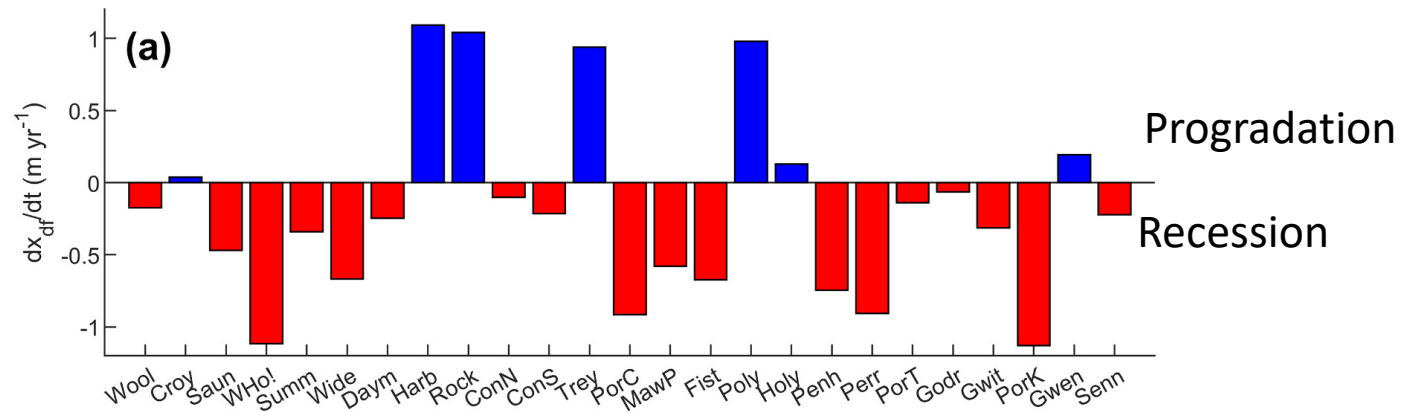


Photo: Peter Ganderton

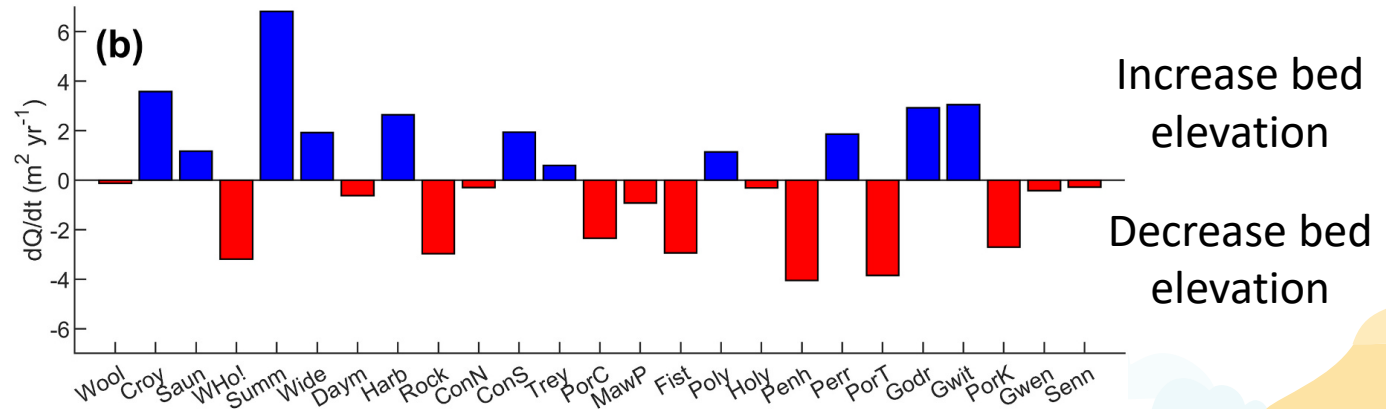


North Cornwall's dune systems - current knowledge

Change in position
of the dune foot
in m per year



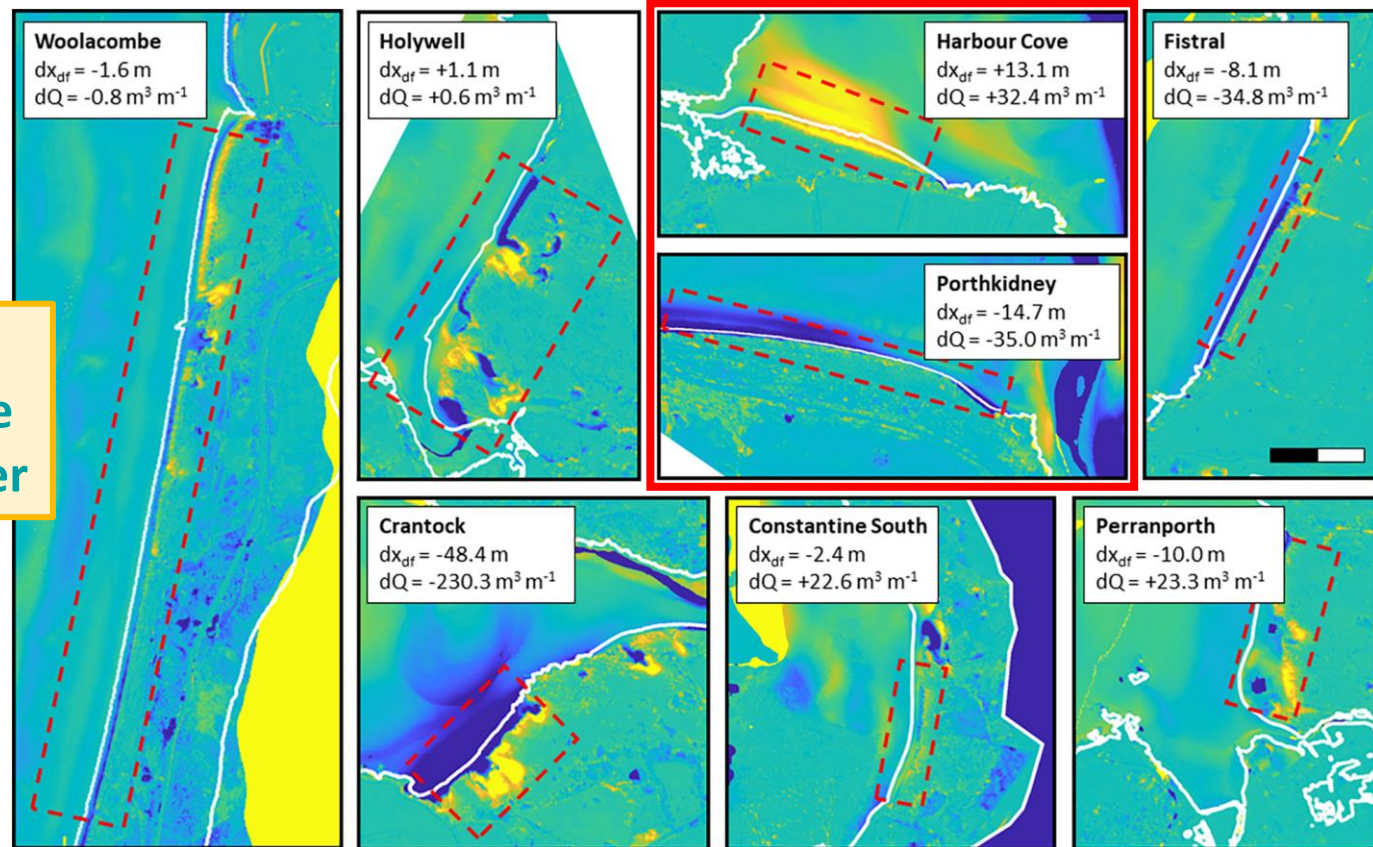
Change in dune
sediment volume
in m^2 per year



(Masselink G. *et al.*, 2022)

Dune evolution – dune roll-over

Some sites demonstrate dune roll-over



Change in bed elevation

- Positive
- Negative

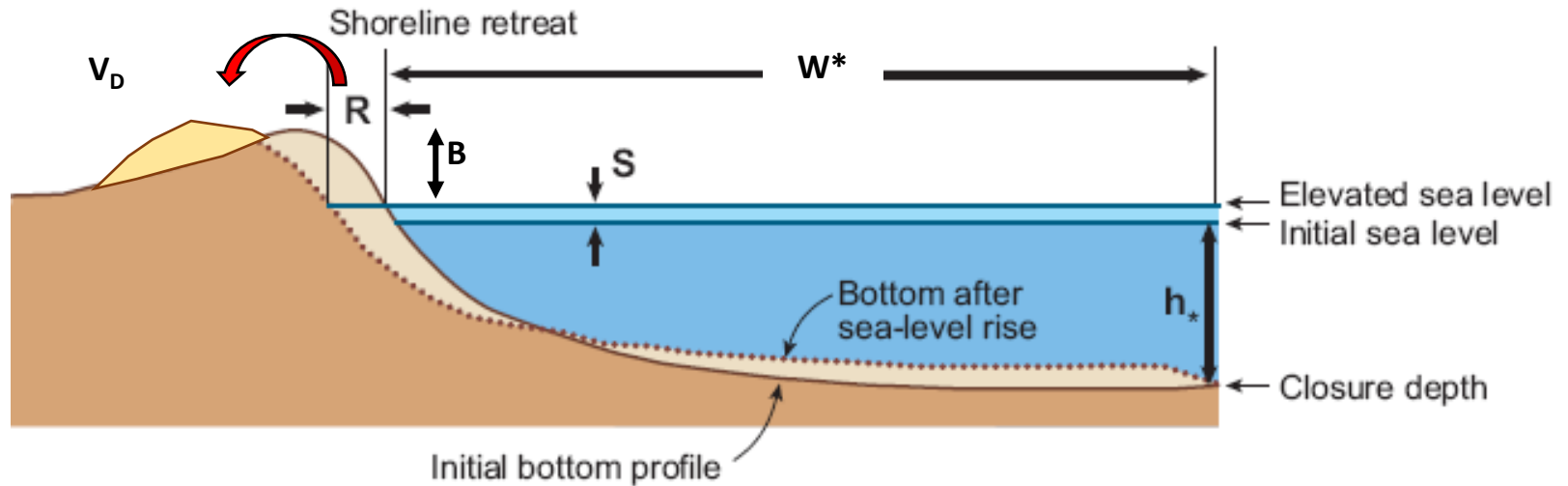
(Masselink G. *et al.*, 2022)

Diversity of the Cornish dune systems



(Masselink G. *et al.*, 2022)

Modelling dune evolution – Equilibrium approaches



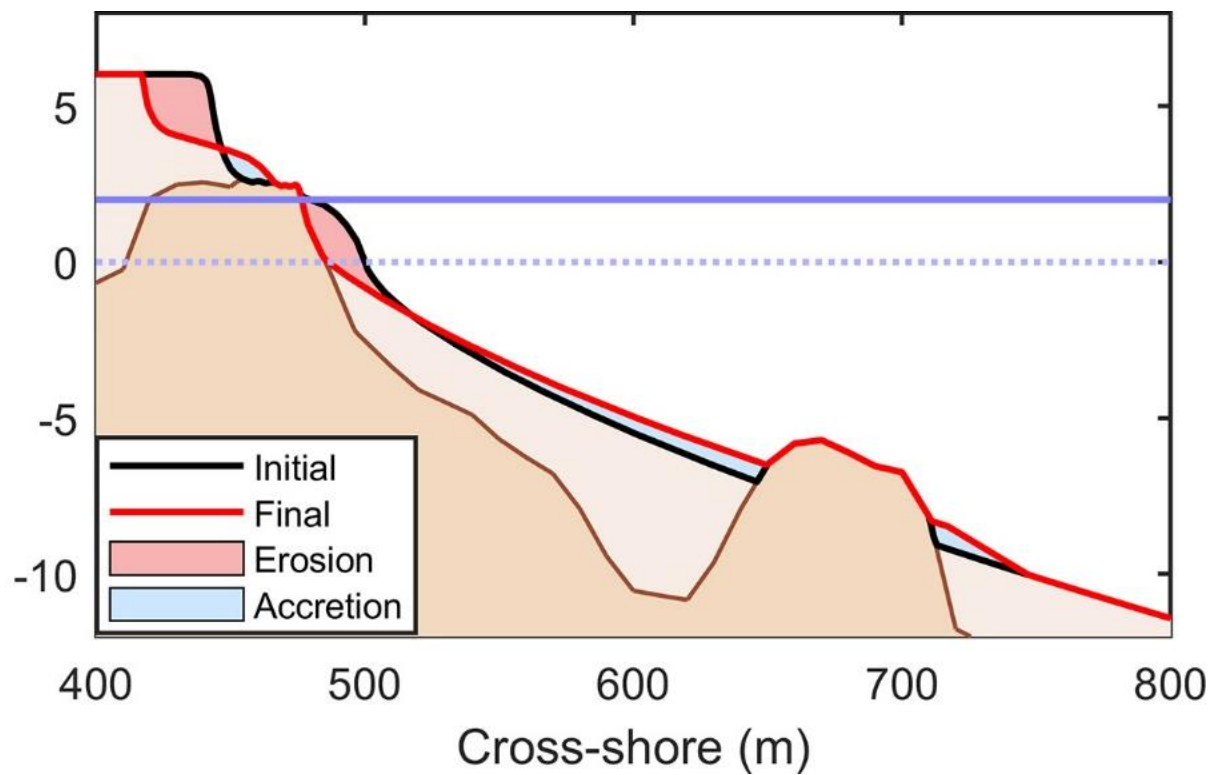
$$R = S \frac{W_*}{h_* + B}$$

'Standard' Bruun Rule

$$R = S \frac{W_* + V_D/S}{h_* + B}$$

Bruun rule with onshore transport

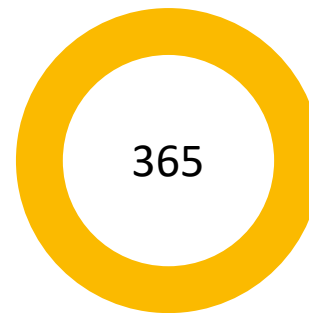
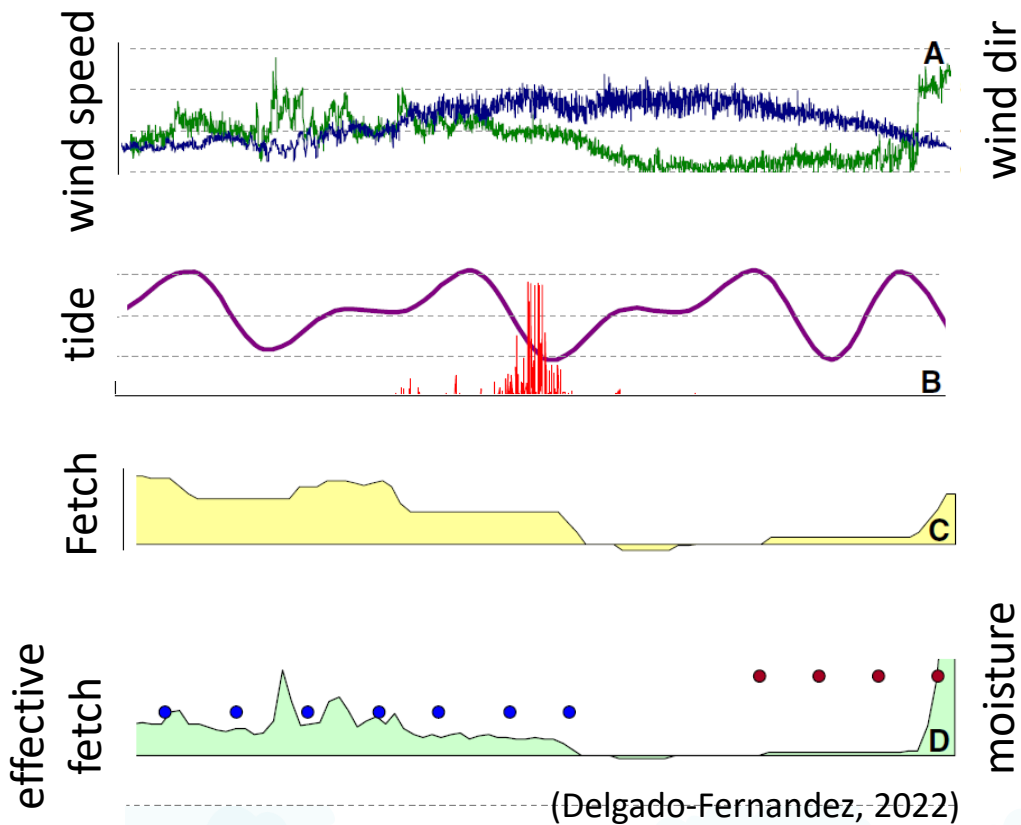
Modelling dune evolution – Rules-based approach



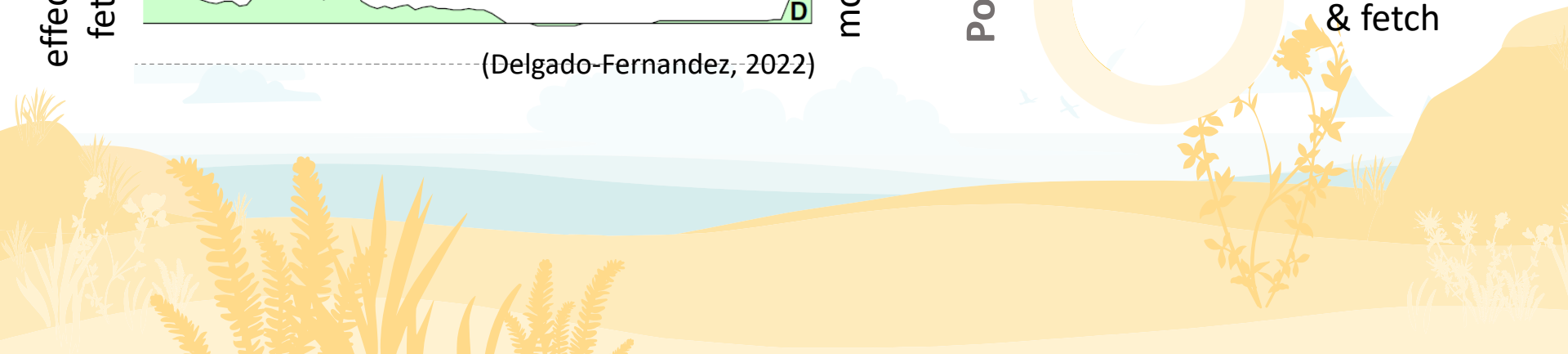
(McCarroll *et al.*, 2021)

Modelling dune evolution – Aeolian sediment transport

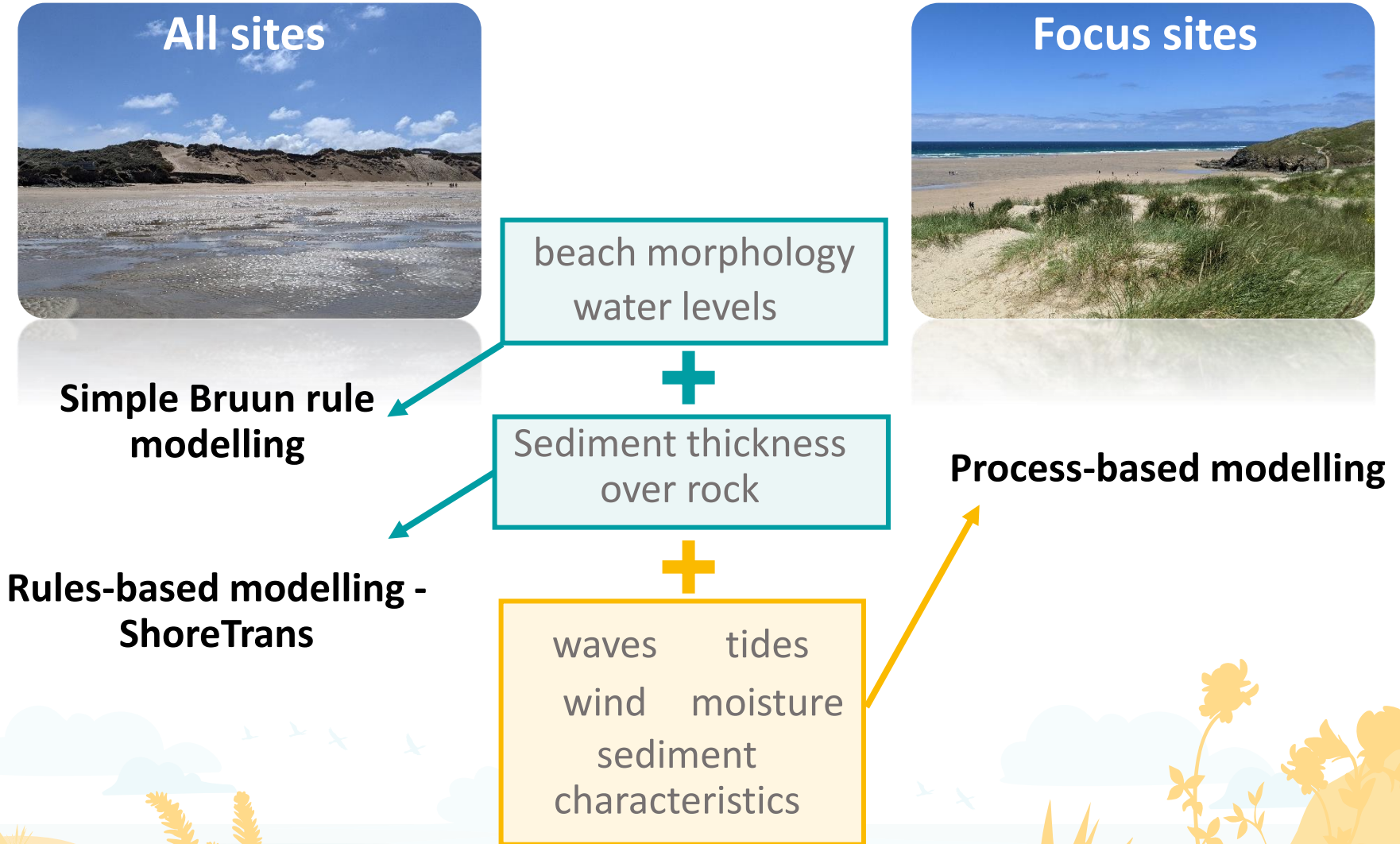
Wind, moisture, and beach width



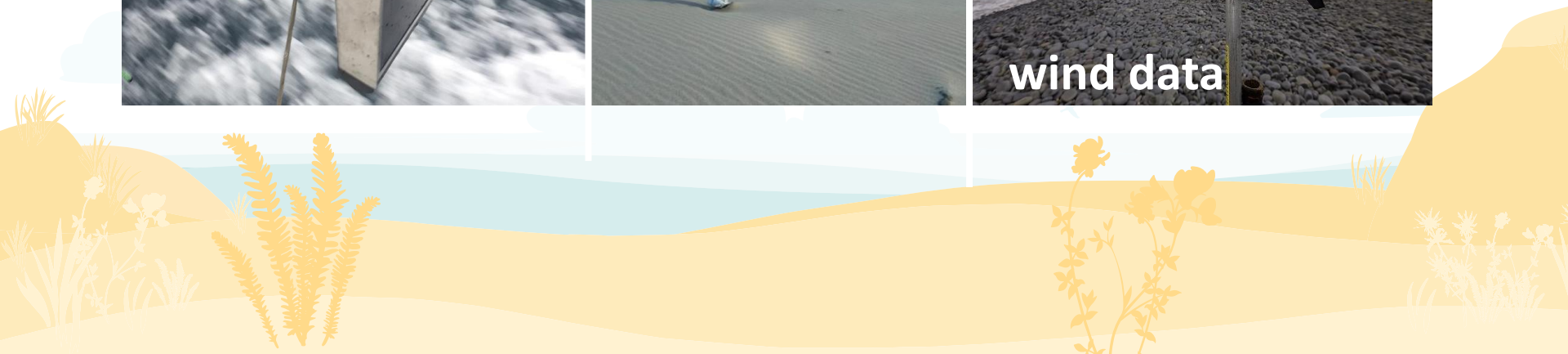
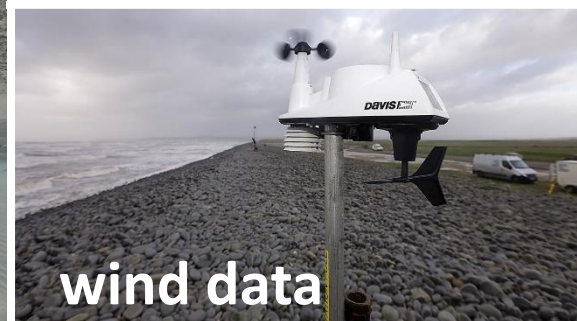
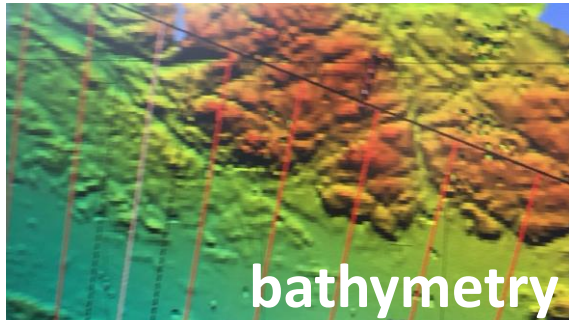
Potential for sediment transport



Innovative dune evolution modelling

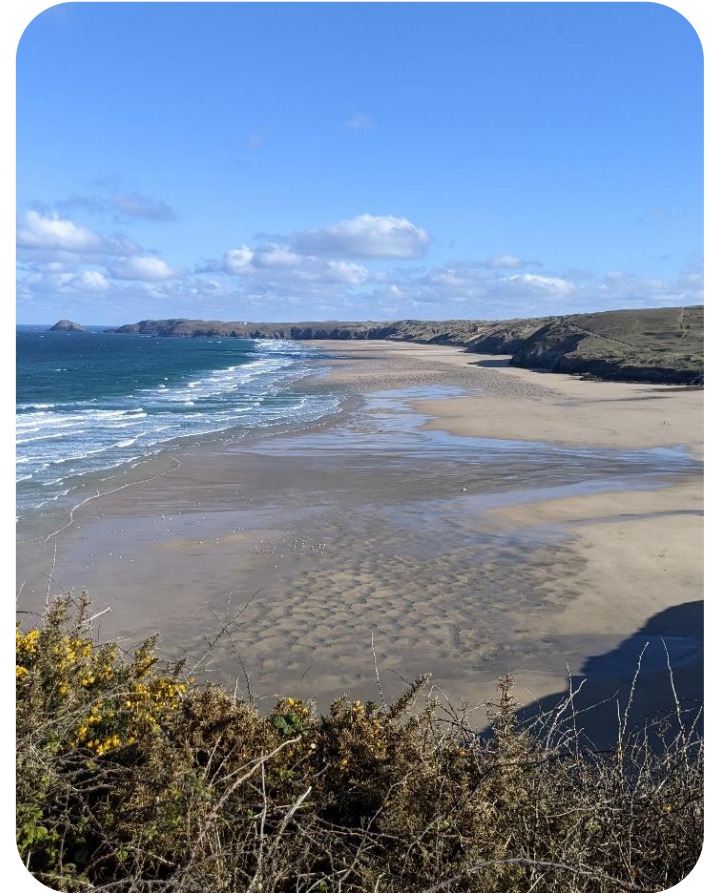


Data Collection



Learning outcomes

- Gain **unprecedented understanding** of how coastal dune systems respond to forcing.
- Raised **awareness of the physical impacts** of SLR on coastal dune systems.
- Identify **adaptation options** to increase coastal resilience.
- Pursue **sustainable climate adaptation strategies** acceptable to coastal communities.





Syril Karn: Andor. S1. Ep2



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Thank you

If you have any questions or comments

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