



IPReM

Greater Caribbean 2023

IDENTIFICATION | PROTECTION | RESTORATION | MANAGEMENT

JUNE 28th-30th, PANAMA

*Science and technology for sustainable beaches
in a climate change scenario*



Nature-based Solutions



Samples of executed Nature-based Solution by Van Oord

“In this presentation we will share some examples of our successful coastal protection projects using Nature-based Solutions”

Alejandro Cacicedo CEng MICE MCI Arb
Regional Manager Caribbean Van Oord



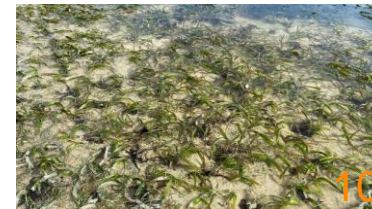
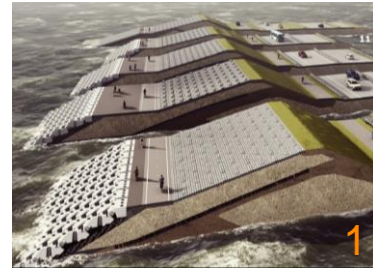
Samples of Nature-based Solutions in coastal protection

- Coastal Protection solutions NBS
- Samples of coastal protection
- Ocean Health Coral regeneration Bahama's



Coastal protection solutions

1. Rock armour or concrete units
2. T-shape groynes
3. Parallel groynes
4. Perpendicular groynes rock or wood
5. Beach nourishment campaigns
6. Sand engine for beach maintenance
7. Integrated Nature in coastal defence
8. Salt Marshes
9. Mangrove
10. Sea grass
11. Coral rehabilitation



Building with Nature

Solutions

Hard



The Afsluitdijk
The Netherlands

Hybrid



Saly
Senegal



Bacton
United Kingdom

Nature-based



EcoShape
Indonesia

The Bacton sandscaping coastal flood scheme in the United Kingdom is an innovative example...

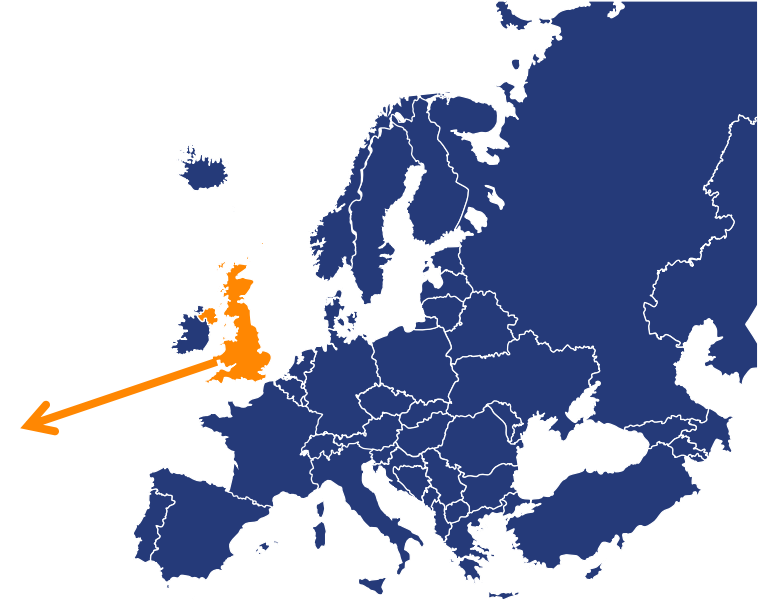
Sand Engine NBS – coastal protection west coast Netherlands, Financed by Dutch Government



Sand Engine NBS – coastal protection east coast UK, Financed by Public and Private



UK - Europe



2019 Execution: <1 years

Beach front: **6 Km**

Private – Public Partnership with various funding sources

Benefits:

- Erosion and flood protection
- Enhancement of recreation and environment



Large scale makes it more cost effective
Public-private partnership with various funding sources
Natural processes help move the sand



Power of the sea to **naturally shift** large quantities of sand down a coastline providing **natural flood protection** to **critical business facilities** and **neighbouring communities**

TERMINAL

Very high protection level
Re-nourishment interval 15-20 years

VILLAGES

Higher beaches & slower erosion
Time for adaptation





Senegal - Africa



2018 Execution: 2.5 years

Coastline: **4 km**

World bank Financed

Benefits:

- Coastal protection
- Tourism / recreation / economy
- Safe Haven for fishery



25-year PPP Beach Management Scheme
(Mackley – Van Oord Subsidiary UK)





25-year PPP Beach Management Scheme
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MACKLEY



PPP Scheme

- Coastal Frontage Heavily Populated – (following historical unsustainable development)
- Government Pays a Monthly Fee
- Contractor maintains a standard of protection – 1 in 50 yr up to 1 in 400 yr
- Better Risk Allocation between Contractor and Government
- Contractor always on call – monitoring beach / storms / surges / Anticipate
- Renourishment / Recycling / By passing
- Actively Managed Coast
- Contractor has time to understand the environment – Monthly Surveys.

Climate Adaptation Solutions Sandy Bay, Gibraltar



Cuba - Mexico, Beach Nourishment



Sandy Bottom, Coral harbour, New Providence, Bahama's



Government funded (Bahama's ministry of national security)

2014 Execution: 2 years

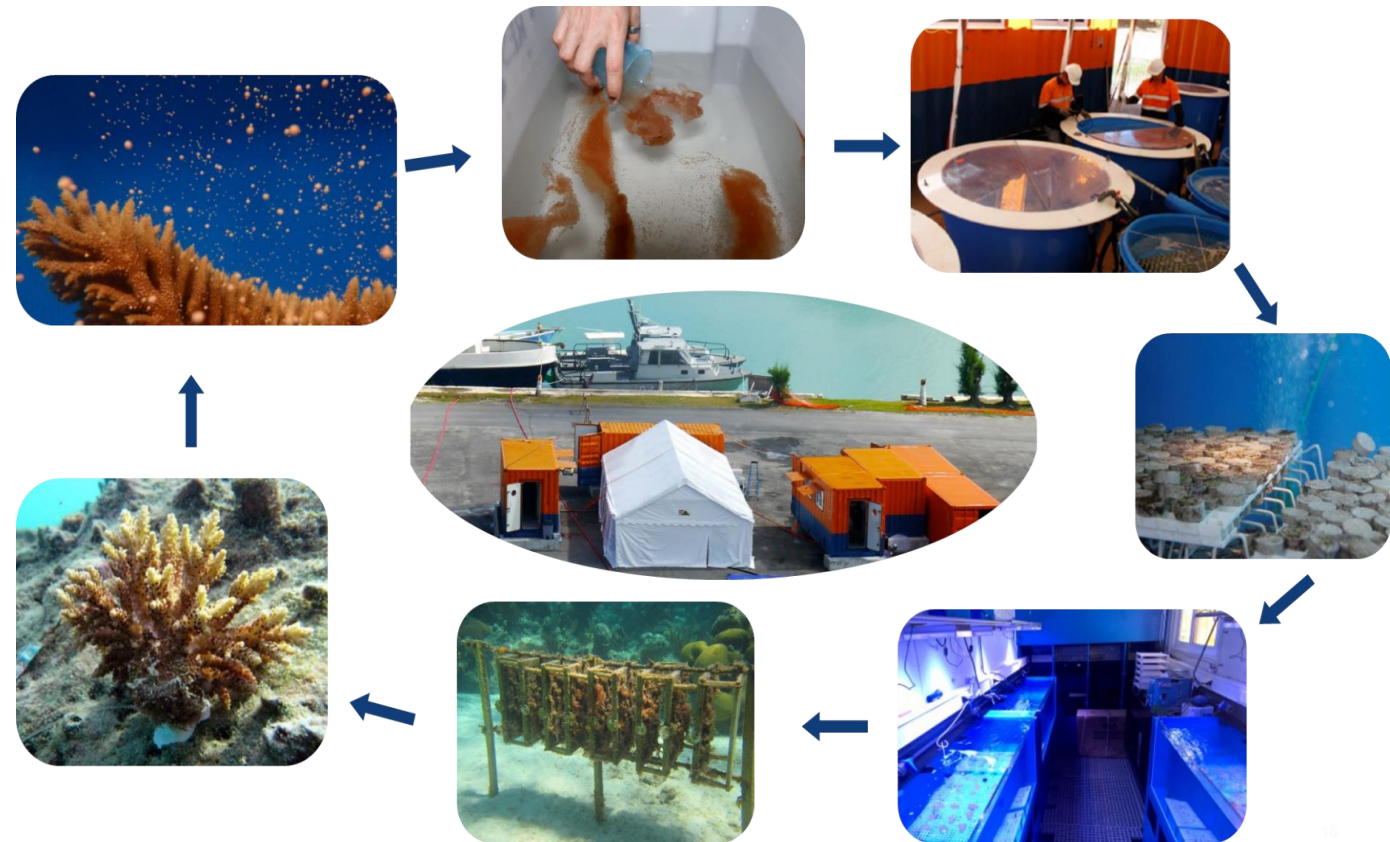
Beach front: **4 km**

Benefits:

- Coral relocation
- Mangrove restoration
- Safe harbour

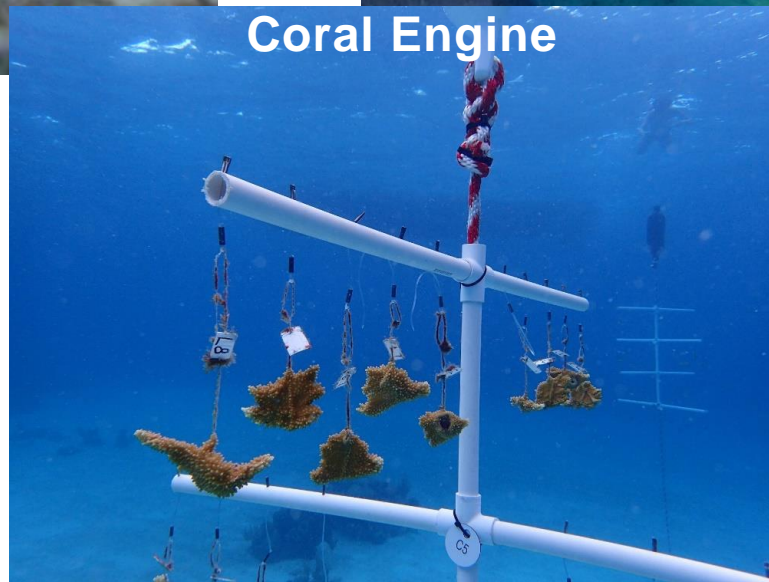
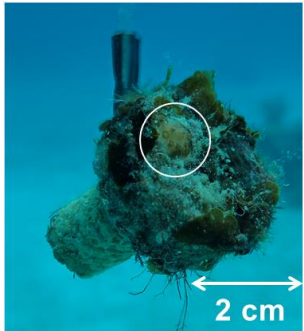
Outplanting corals obtained from active propagation:

- Fragmentation → quick results
- Breeding → genetic diverse + unlimited supply (Van Oord ReefGuard system)

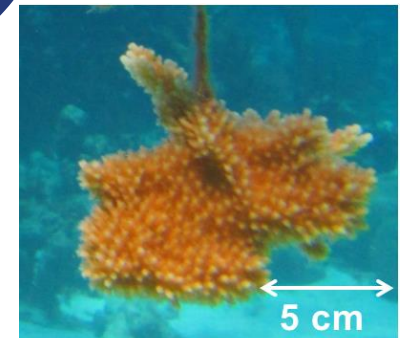




2016 + 2017



2017





S.E.A.

Sustainable Earth Actions



Questions?