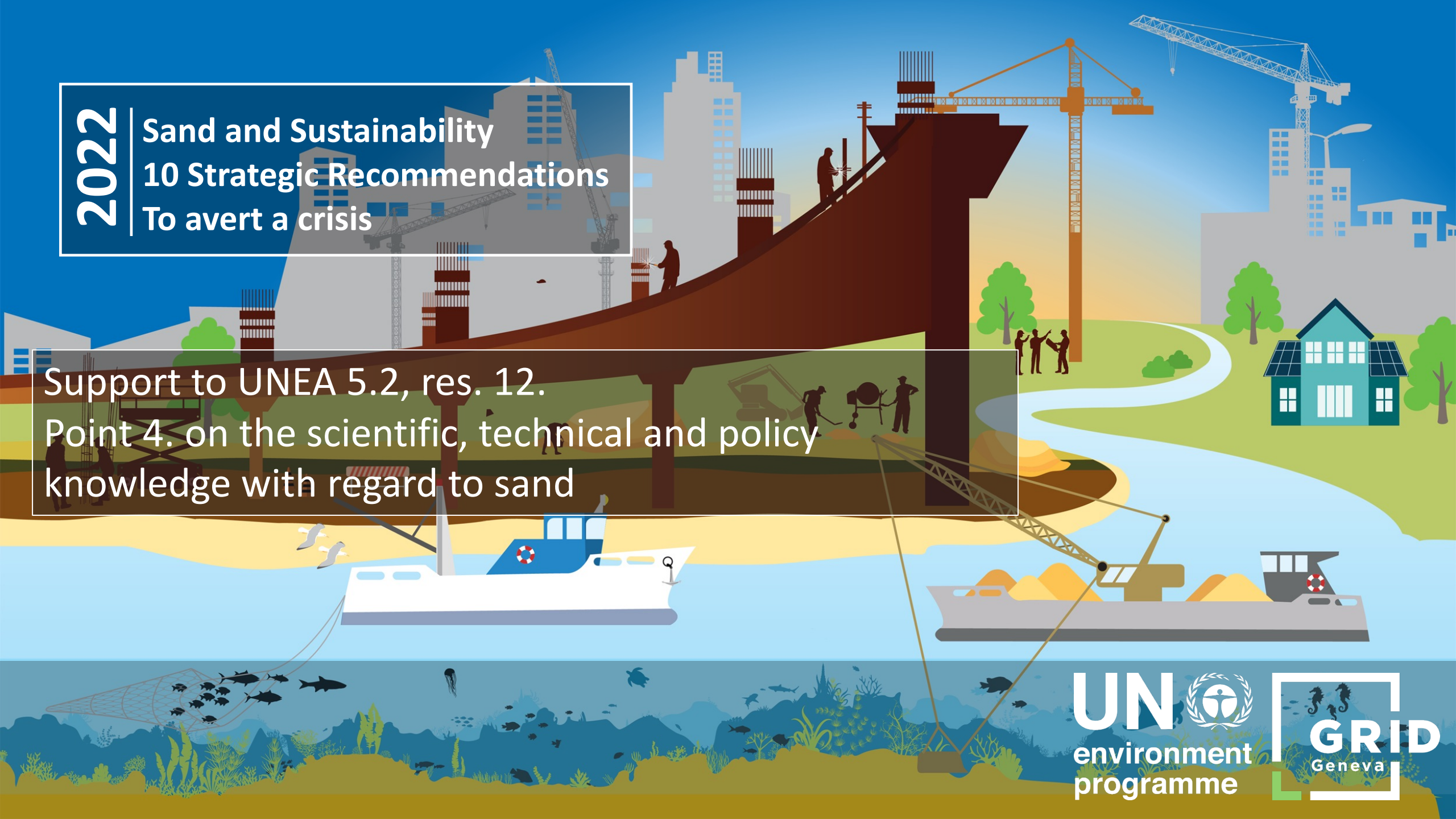

2022
Sand and Sustainability
10 Strategic Recommendations
To avert a crisis
Support to UNEA 5.2, res. 12.
Point 4. on the scientific, technical and policy knowledge with regard to sand
UN environment programme
GRID Geneva

When talking about sand, most people think about a beautiful beach…


But our relationship with sand is mostly about this: building roads…
UN environment programme
GRID Geneva


Buildings, hostpitals, schools,
homes, industries…
UN environment programme
GRID Geneva
Photo by Carl Solder

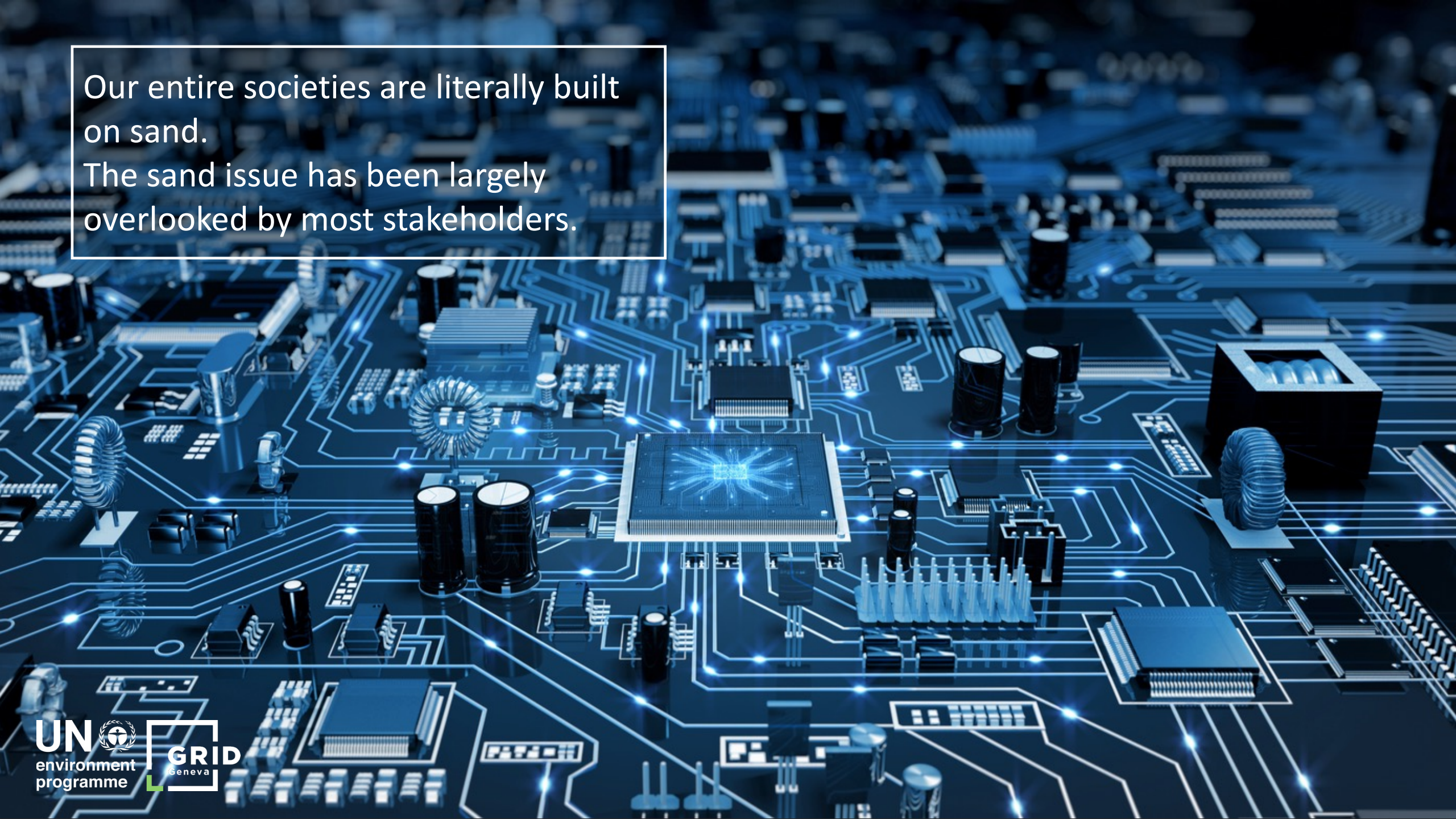
As well as other infrastructures made of concrete, such as bridges, dams, dikes.

UN environment programme

GRID Geneva


Glass and windows are also made of sand.
UN environment programme
GRID Geneva


We are using sand for land reclamation.

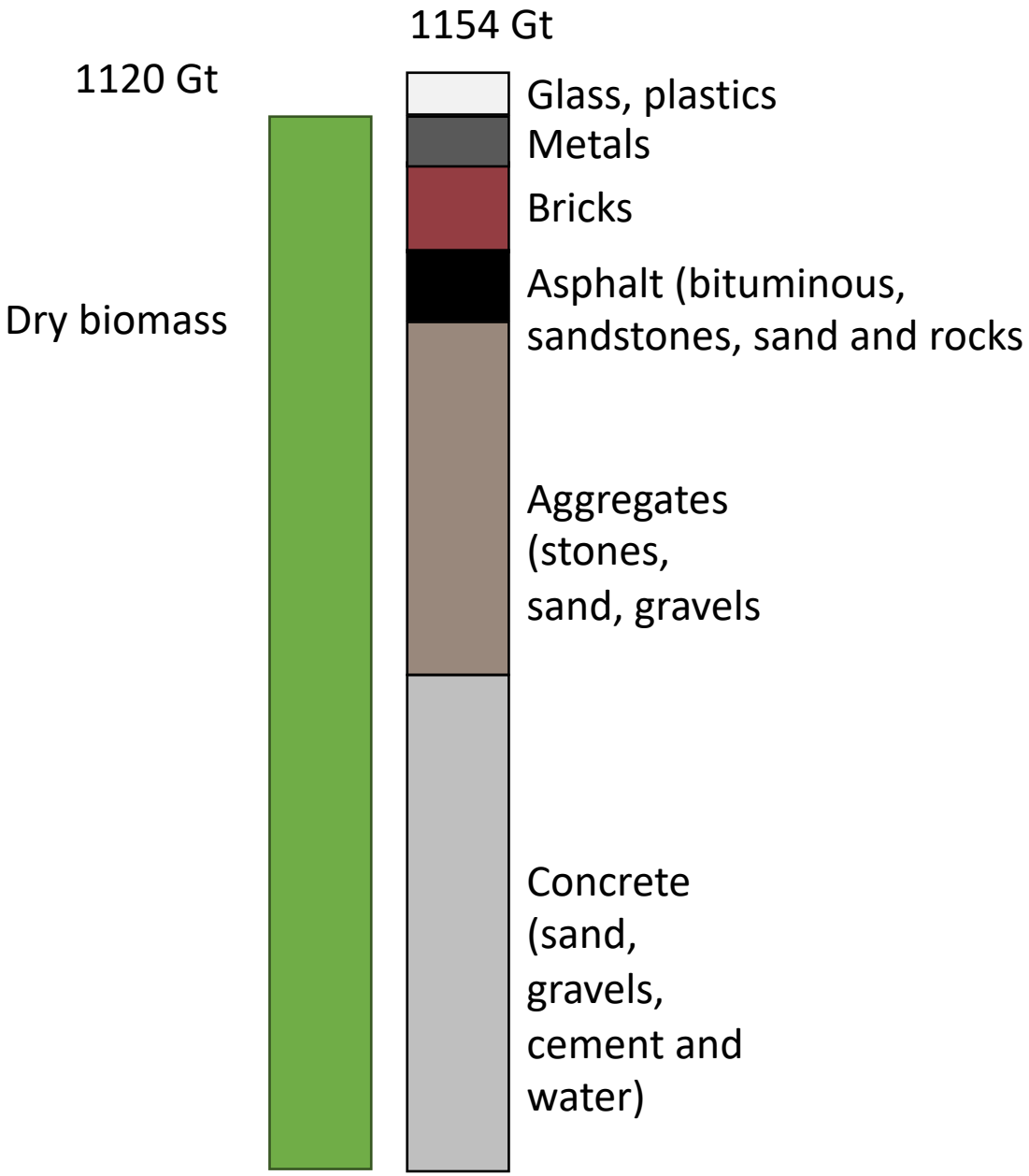

Our entire societies are literally built on sand.
The sand issue has been largely overlooked by most stakeholders.
UN environment programme
GRID Geneva


Sand is produced through erosion process over a geological time-scale

But we are extracting 50 billion tons of sand and gravels per year

UN environment programme

GRID Geneva



In 2020, the amount of man-made building material, exceeded global living biomass And sand and gravels account for most (>80%) of this.

Global human-made mass exceeds all living biomass
Elhacham, E., Ben-Uri, L., Grozovski, J., Bar-On, Y. M., & Milo, R. (2020). Global human-made mass exceeds all living biomass. *Nature*, *588*(7838), 442-444
https://www.nature.com/articles/s41586-020-3010-5?s=09

https://www.visualcapitalist.com/visualizing-the-accumulation-of-human-made-mass-on-earth/


Sand can be extracted from static (non-active) area, such as quarries…


… and by crunching rocks
UN environment programme
GRID Geneva


or from dynamic area such as beaches.


from rivers, where sand is
plaing a key role for controling
the river flow and biodiversity.


It can generate river’s bank erosion, induce flood or drought by changing river flows

Increasingly from marine area, with impacts on biodiversity, fisheries and potentially on coastal erosion.

UNEP Global Environmental Alert Service (GEAS)

Taking the pulse of the planet; connecting science with policy

UNEP

Website: www.unep.org/geas E-mail: geas@unep.org

March 2014 Home Subscribe Archive Contact

Thematic focus: Ecosystem management, Environmental governance, Resource efficiency

Sand, rarer than one thinks

Sand and gravel are mined world-wide and account for the largest volume of solid material extracted globally. Formed by erosive processes over thousands of years (John, 2009), they are now being extracted at a rate far greater than their renewal. Furthermore, the volume being extracted is having a major impact on rivers, deltas and coastal and marine ecosystems (Figure 1), results in loss of land through river or coastal erosion, lowering of the water table and decreases in the amount of sediment supply. Despite the colossal quantities of sand and gravel being used, our increasing dependence on them and the significant impact that their extraction has on the environment, this issue has been mostly ignored by policy makers and remains largely unknown by the general public.

Why is this issue important?

Globally, between 47 and 59 billion tonnes of material is mined every year (Steinberger et al., 2010), of which sand and gravel, hereafter known as aggregates, account for both the largest share (from 68% to 85%) and the fastest extraction increase (Krausmann et al., 2009). Surprisingly, although more sand and gravel are mined than any other material, reliable data on their extraction in certain developed countries are available only for recent years (Krausmann et al., 2009). The absence of global data on aggregates mining makes environmental assessment very difficult and has contributed to the lack of awareness about this issue.

One way to estimate the global use of aggregates indirectly is through the production of cement for concrete (concrete is made with cement, water, sand and gravel). The production of cement is reported by 150 countries and reached 3.7 billion tonnes in 2012 (USGS, 2013a). For each tonne of cement, the building industry needs about six to seven times more tonnes of sand and gravel (USGS, 2013b). Thus, the world's use of aggregates for concrete can be estimated at 25.9 billion to 29.6 billion tonnes a year for 2012 alone. This represents enough concrete to build a wall 27 metres high by 27 metres wide around the equator.

1

UNEP 2014

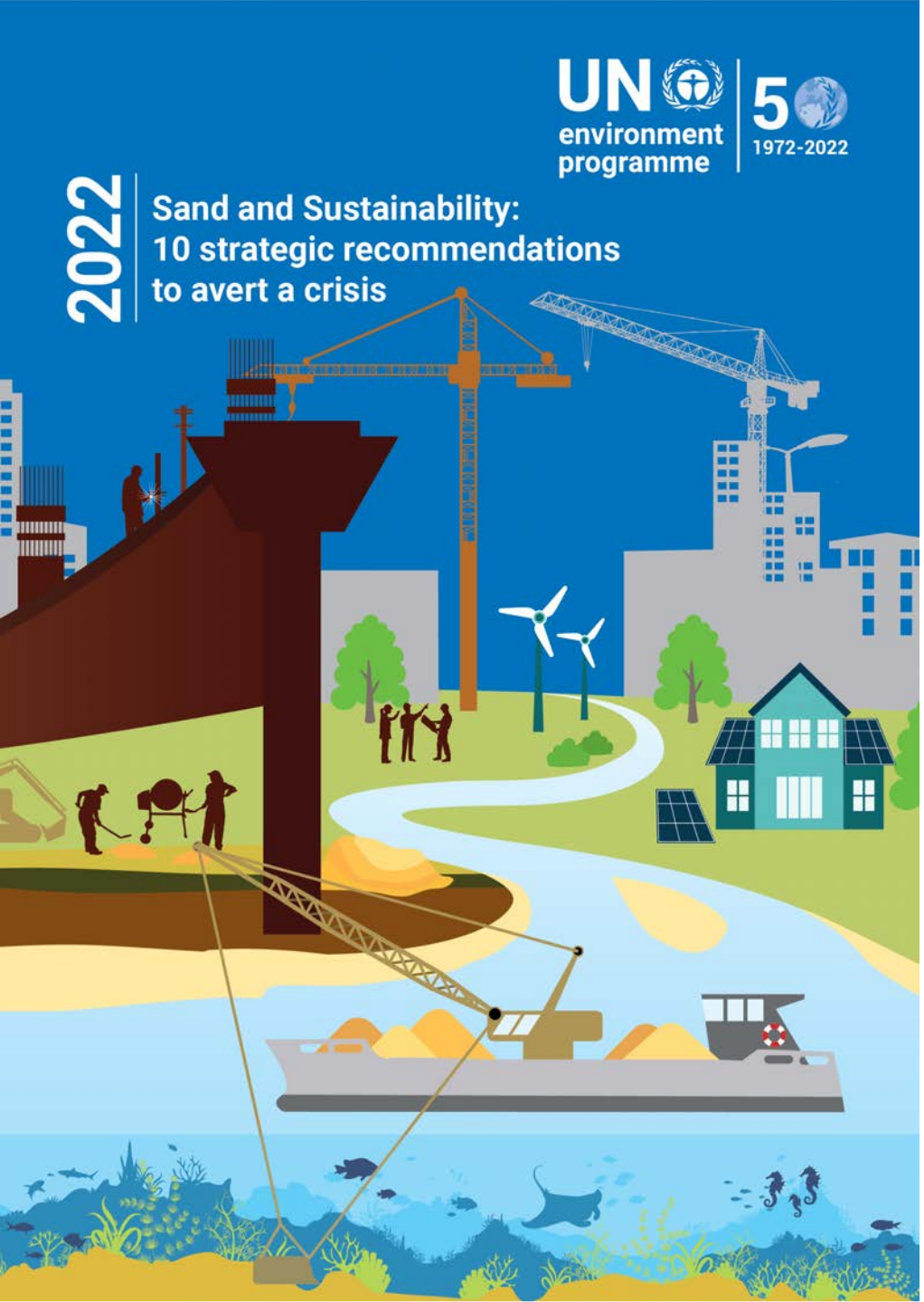
UNEP has raised awareness on the sand issue since 2014 and already a report presented to UNEA 4 in 2019

UN environment programme GRID Geneva

UNEA 5.2, res. 12.

4. Requests the Executive Director, through the Global Resource Information Database (GRID-Geneva), to strengthen scientific, technical and policy knowledge with regard to sand, and to support global policies and action regarding the environmentally sound extraction and use thereof;

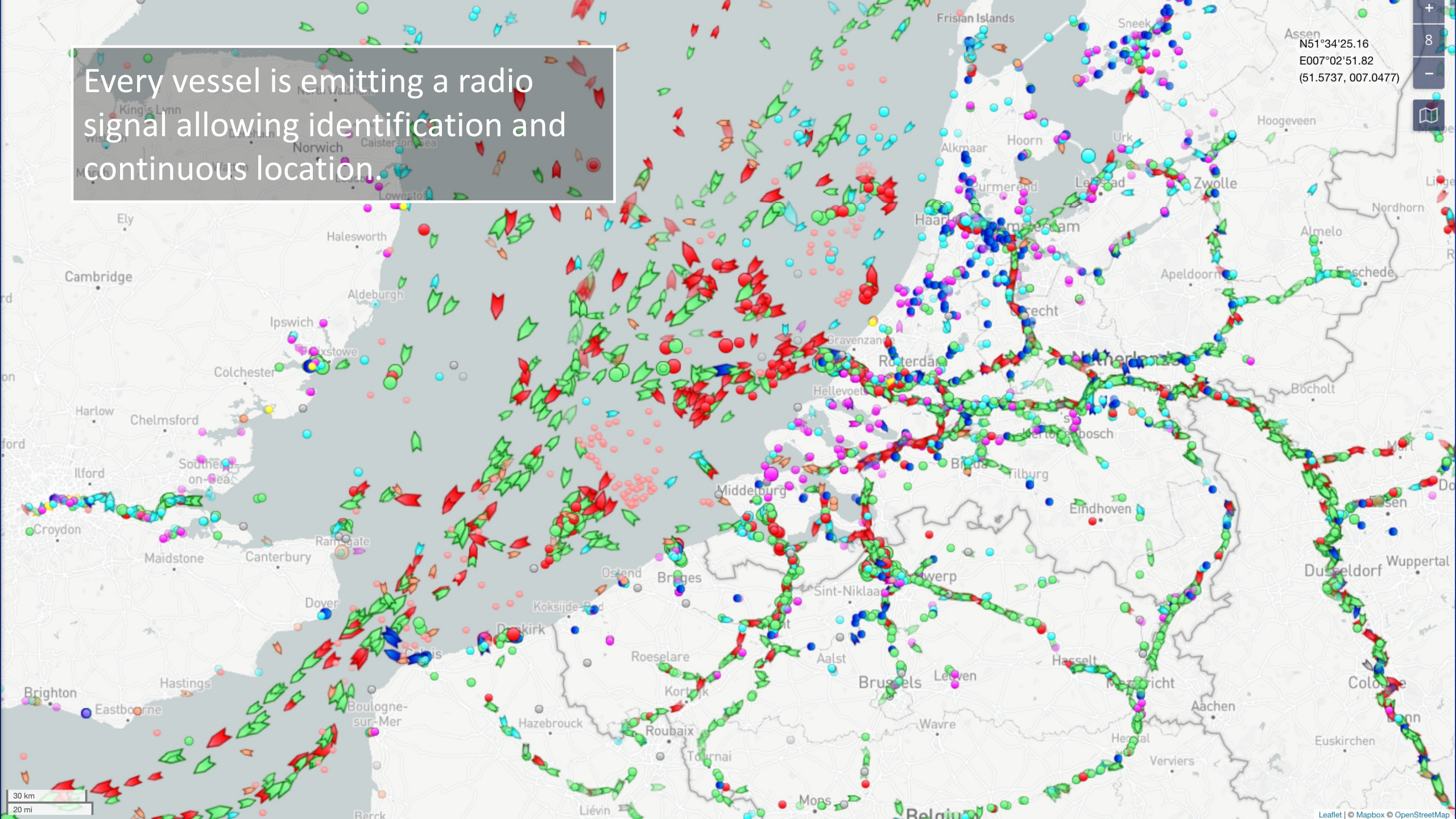
Impacts on International policy

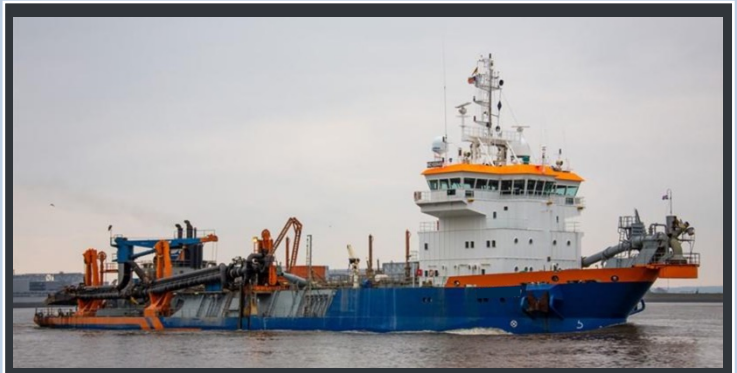


Report officially launched by UNEP on 26 April 2022

Will launched by UNEP on
14 March 2023

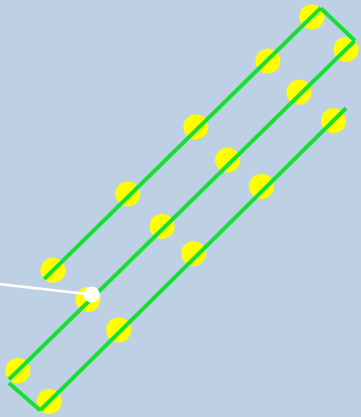
UN environment programme


Every vessel is emitting a radio signal allowing identification and continuous location.
N51°34'25.16
E007°02'51.82
(51.5737, 007.0477)
Frisian Islands
Sneek
Assen
Hoogeveen
Hoorn
Alkmaar
Urk
Zwolle
Nordhorn
Almelo
Enschede
Apeldoorn
Amsterdam
Rotterdam
Gravenzande
Hellevoetsluis
Bocholt
Tilburg
Eindhoven
Middelburg
Vlissingen
Sint-Niklaas
Antwerp
Bruges
Ostend
Koksijde
Dunkirk
Calais
Roeselare
Aalst
Brussels
Leuven
Hasselt
Aachen
Wuppertal
Düsseldorf
Euskirchen
Verviers
Wavre
Roubaix
Tournai
Mons
Hazebrouck
Boulogne-sur-Mer
Dover
Ramsgate
Canterbury
Maidstone
Croydon
Ilford
Southend-on-Sea
Chelmsford
Harlow
Colchester
Ipswich
Aldeburgh
Halesworth
Ely
Cambridge
King's Lynn
Norwich
Lowestoft
Hastings
Eastbourne
Brighton
30 km
20 mi
Leaflet | © Mapbox © OpenStreetMap

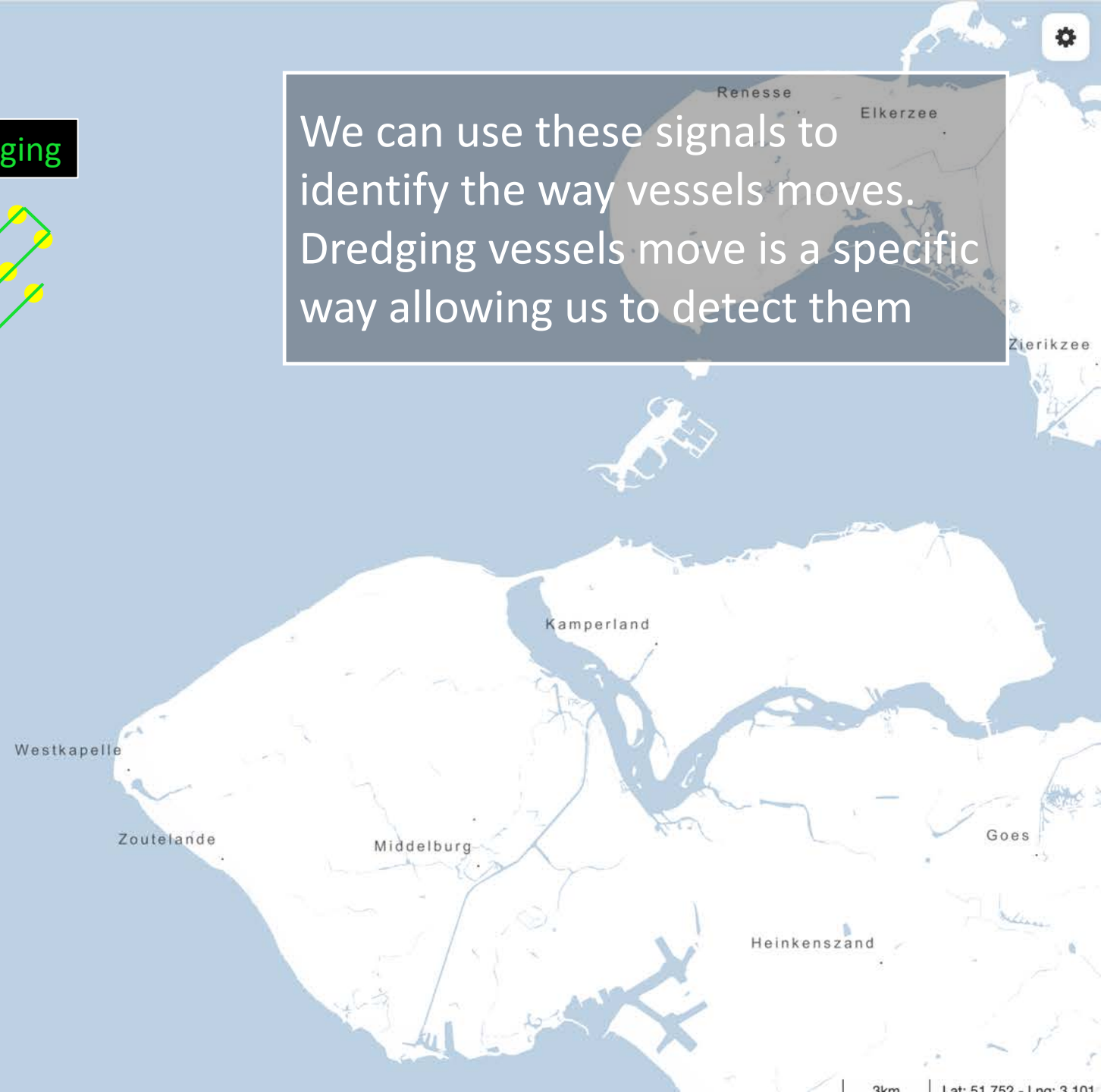


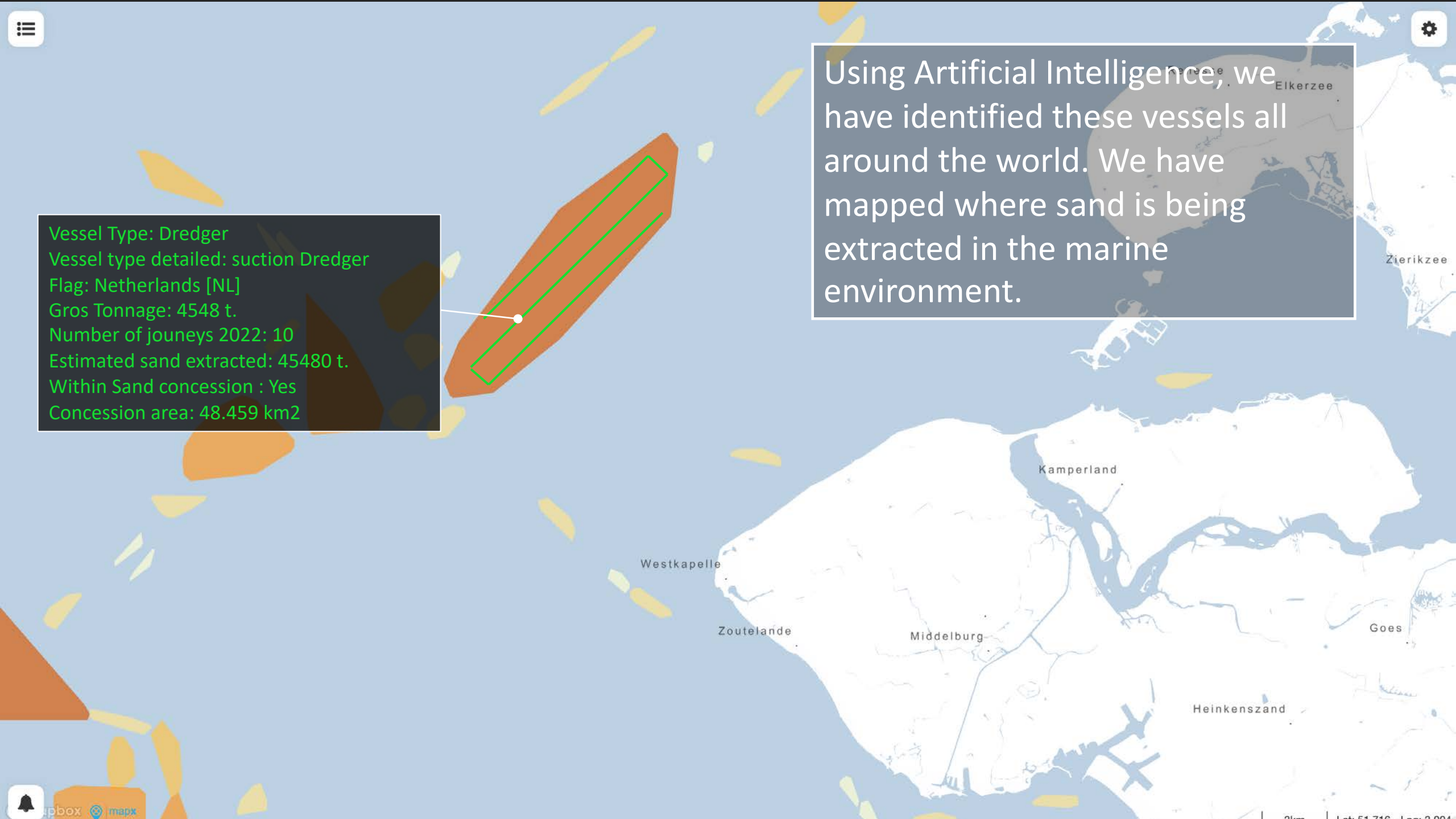
Vessel Information
IMO: 1234567*
Name: XYZ 123*
Vessel Type: Dredger
Vessel type detailed: suction Dredger
Navigational Staus: Active
Flag: Netherlands [NL]
Gros Tonnage: 4548 t.
Length: 97.26 x 18.4 m
Year Built: 2000
Home Port: Rotterdam
Current location: 49.47686°N / 0.1329817°E
Current Port: Le Havre
Received : 2 minutes ago
Navigational Status: Moored
Speed/Course: 0 kn / 344°
Society: ABC*
Owner: DEF*
Manager: GHI*
Nearby Vessels

Dredging



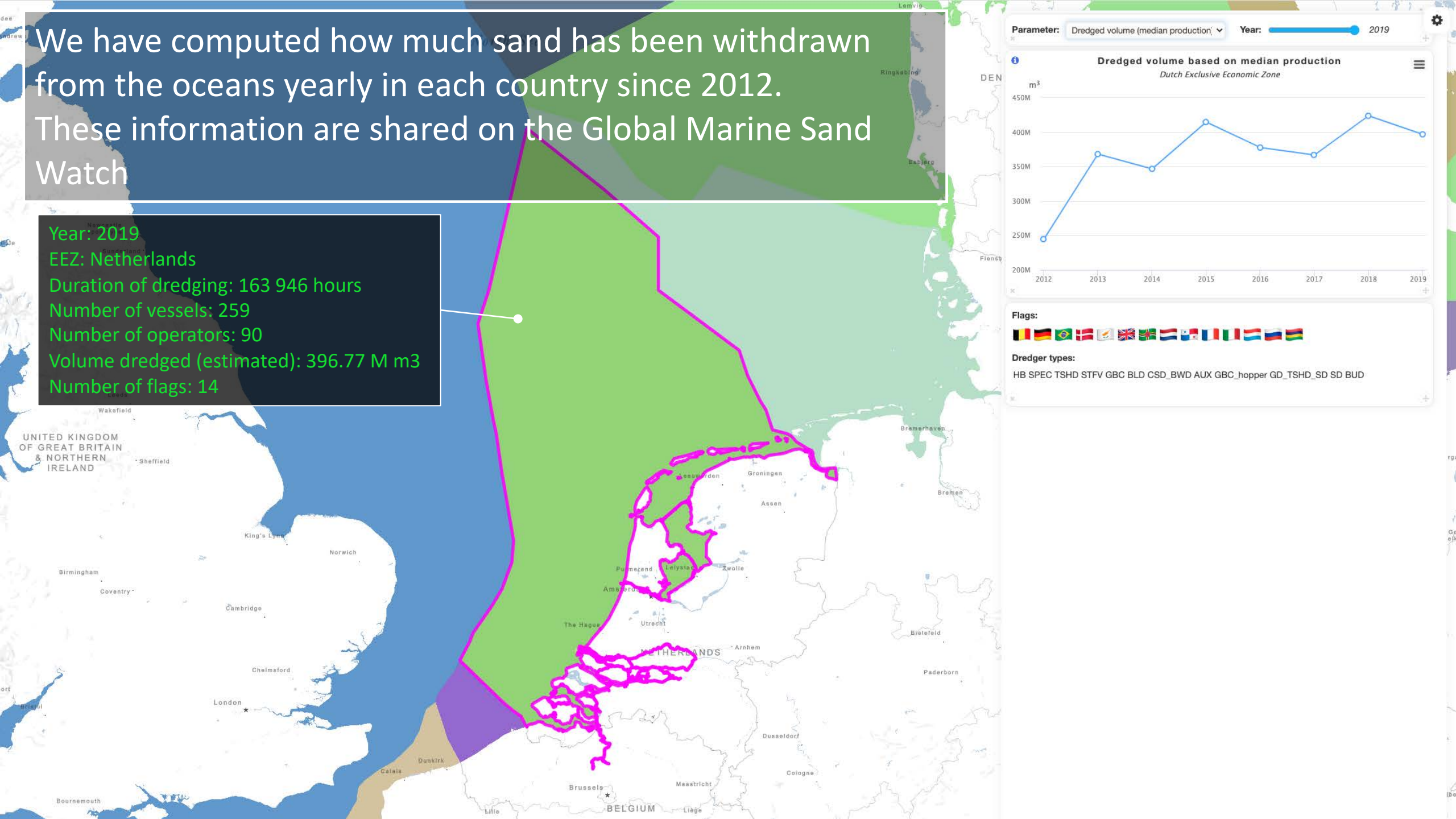
We can use these signals to identify the way vessels moves. Dredging vessels move is a specific way allowing us to detect them



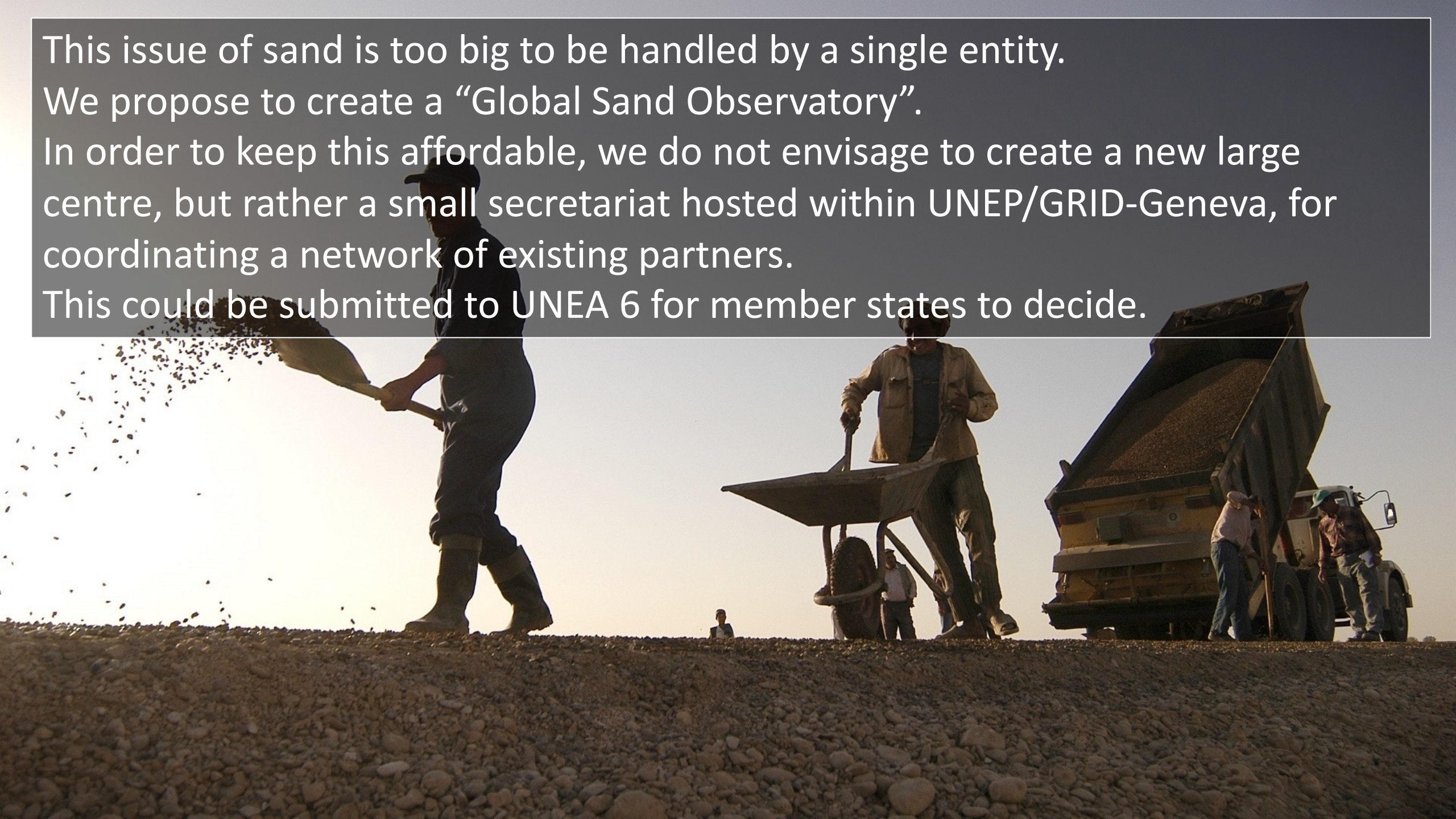

Using Artificial Intelligence, we have identified these vessels all around the world. We have mapped where sand is being extracted in the marine environment.
Vessel Type: Dredger
Vessel type detailed: suction Dredger
Flag: Netherlands [NL]
Gros Tonnage: 4548 t.
Number of jouneys 2022: 10
Estimated sand extracted: 45480 t.
Within Sand concession : Yes
Concession area: 48.459 km2
Elkerzee
Zierikzee
Kamperland
Westkapelle
Zoutelande
Middelburg
Goes
Heinkenszand

We have computed how much sand has been withdrawn from the oceans yearly in each country since 2012.
These information are shared on the Global Marine Sand Watch

Year: 2019
EEZ: Netherlands
Duration of dredging: 163 946 hours
Number of vessels: 259
Number of operators: 90
Volume dredged (estimated): 396.77 M m3
Number of flags: 14



This issue of sand is too big to be handled by a single entity.
We propose to create a “Global Sand Observatory”.
In order to keep this affordable, we do not envisage to create a new large centre, but rather a small secretariat hosted within UNEP/GRID-Geneva, for coordinating a network of existing partners.
This could be submitted to UNEA 6 for member states to decide.



Global Sand Observatory

ORGANISATIONAL ACTIVITIES (Bureau)

- Coordination
- Networking (maintenance, growth, parterships)
- Communication (media, web, webinars, conferences)
- Integration and dissemination of contents (database, web)
- Fund raising
- Advocacy

A small secretariat coorinating a network of parthers.

Three working groups

Monitoring and mapping
- Monitoring extraction, impacts and use
- Mapping demand and resources
- Marine dredging watch
- LCAs

Governance & Best practices
- Industry standards (building, extractives)
- Policy – regulation, Environmental mgt
- Finances + development

Technical solutions
- Harvesting existing solutions
- Innovation
- Dissemination
- Reducing, replacing, substitution, reuse, restores, recycle…

Partners having expressed interest , so far…

UN and International Organizations
United Nations Environment Programme (UNEP/GRID-Geneva - Secretariat)
Int. Union for Conservation of Nature (IUCN)
International Labor Organization (ILO)
United Nations Development Programme
UNIDO

Governments
Makueni County Sand Conservation and Utilization Authority (Kenya)
Royal Belgian Institute of Natural Sciences
Swiss Federal Office for the Environment

Environmental Organizations and NGOs
Ecologic Architects
Network of Women for Water (Sri Lanka)
Sand Stories
Stockholm Resilience Centre
WWF

Universities
EPFL
Ghent University
London School of Economics
University of Newcastle
University of Queensland (Sustainable Mineral Institute)
University of Geneva
Université Catholique de Louvain
University of Exeter
University of Plymouth
Michigan State University

Others
Bureau Brussels (public affairs)
Chatham House
Deltares
MPA

Private sector
Ecometrics
European Marine Sand and Gravel Group
Global Aggregates Information Network
Gemax BV
International Association of Dredging Companies (IADC)
Jan de Nul Group
Sibelco
Union Européenne des Producteurs de Granulats (UEPG)
Vale S.A
YA Engineering Services

Contacts

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UNEP/GRID-Geneva

United Nations Environment Programme

Contact on sand activity

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https://unepgrid.ch/sand