



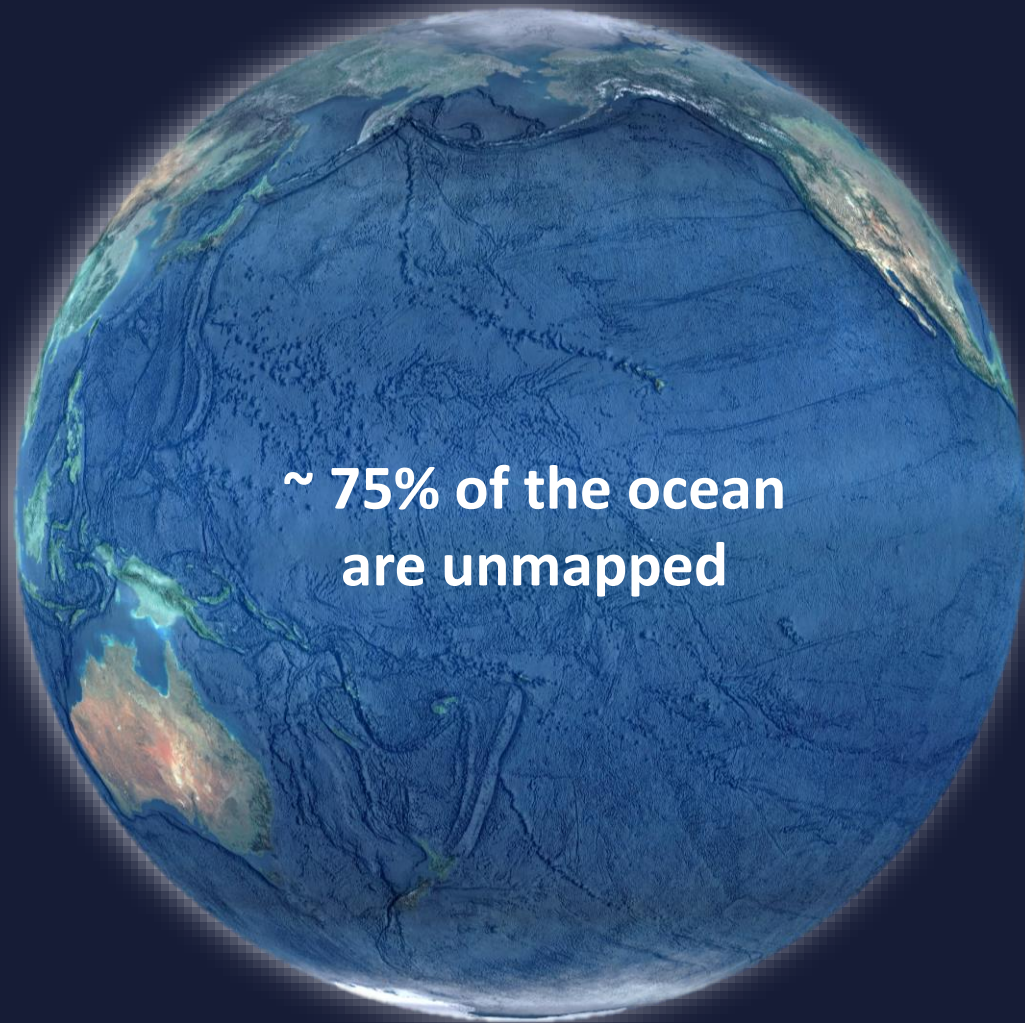
EOMAP

# MONITORING COASTAL BATHYMETRY

CLOUD BASED SATELLITE ANALYTICS REVEAL SEABED IN 4D

Oceanology International 2024

2024-03-13 | Mona Reithmeier



~ 75% of the ocean  
are unmapped





## WHO WE ARE



Earth Observation and IT  
solution provider



Focus on coastal and aquatic  
environments



International & -disciplinary  
staff of 40+



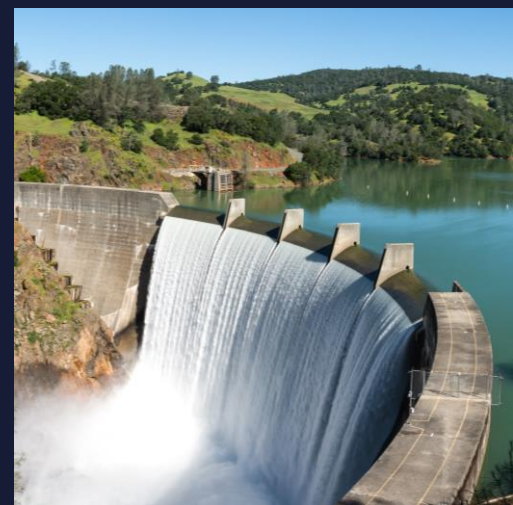
Global provider of data, IT and  
intelligence to industry,  
government and defence



HQ in Germany  
with affiliates in  
USA, Australia,  
Indonesia, Dubai



EOMAP





# SATELLITES



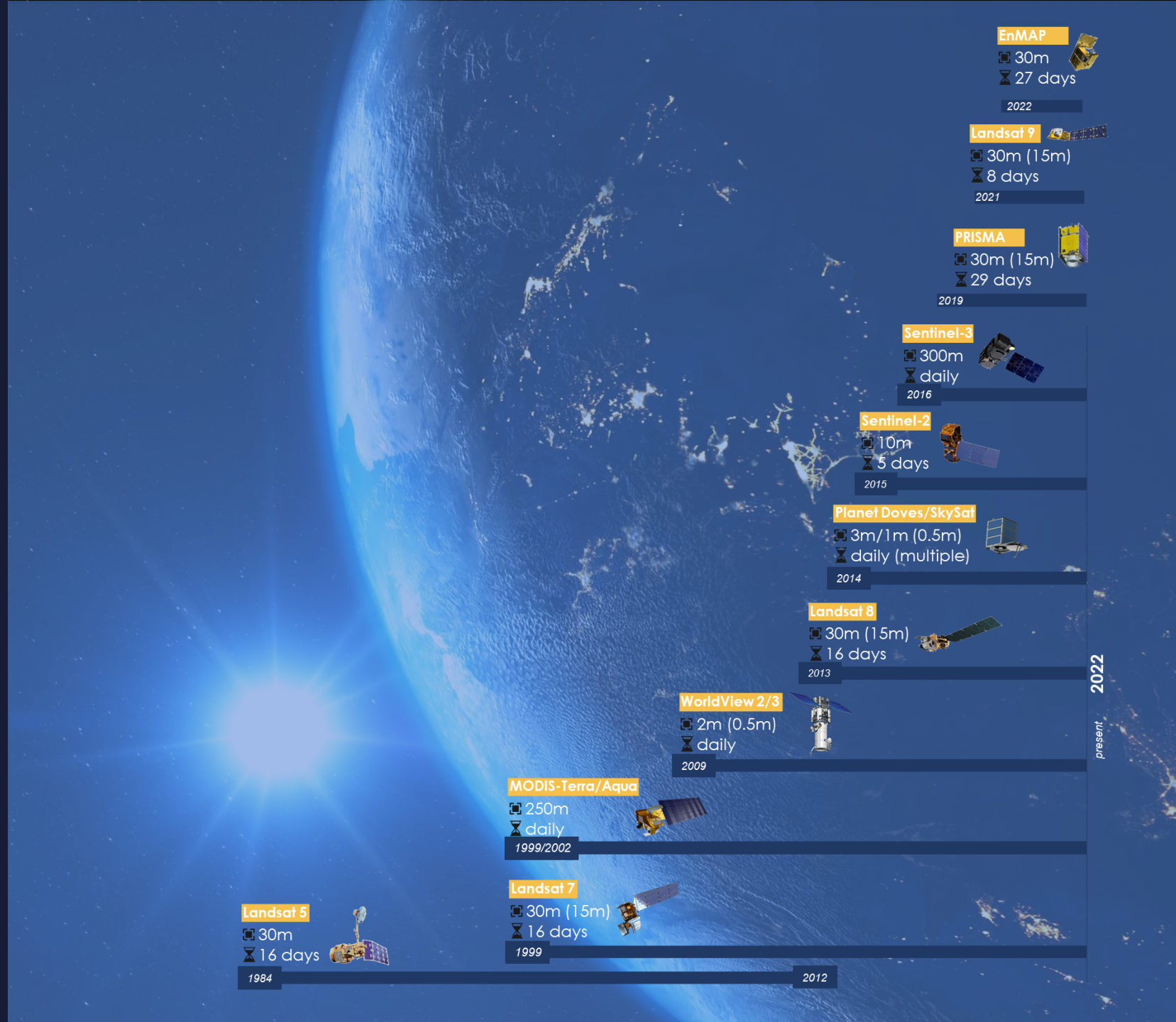
Back in time over decades



Data everywhere even for small water bodies



Multiple daily acquisitions



## HORIZONTAL DYNAMICS

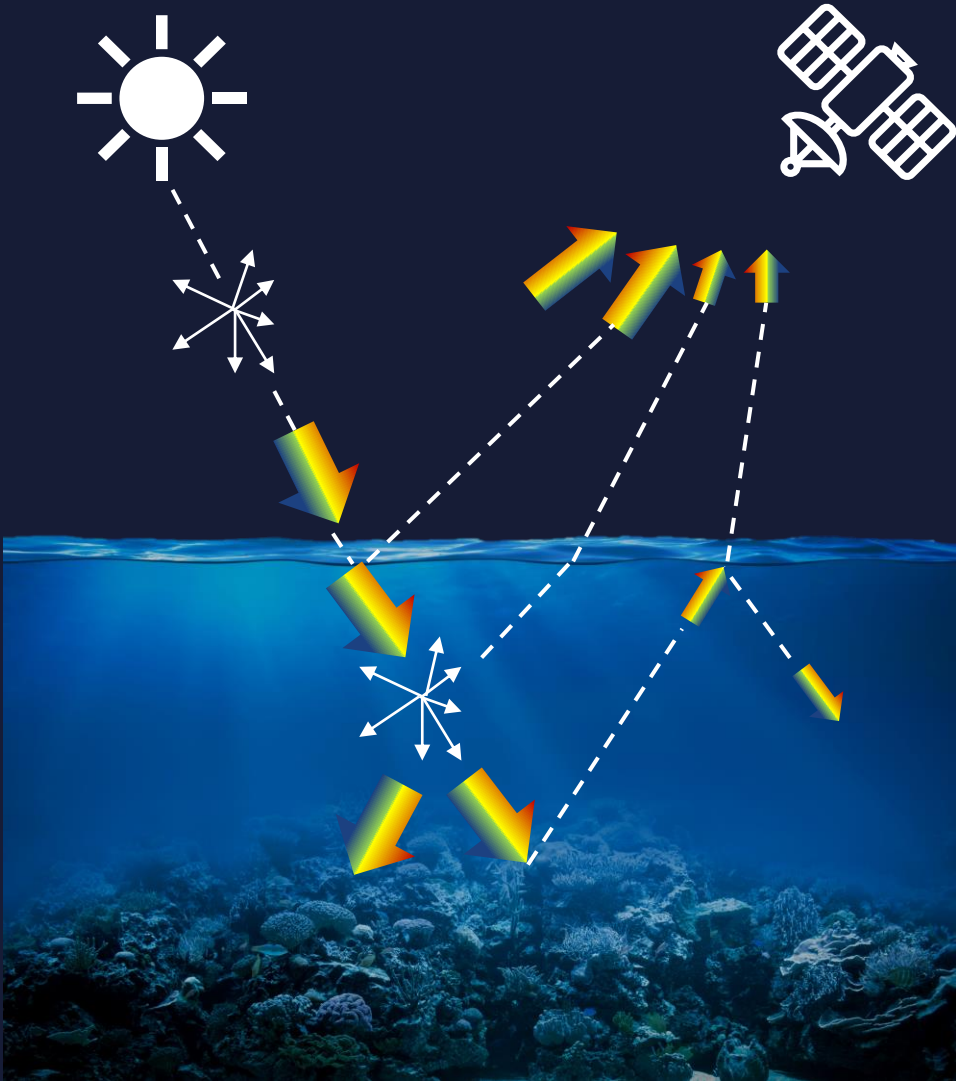
Global high frequent satellite monitoring capabilities

Continuous tracking of horizontal seabed movements based on optical flow methods.

-> Delineation of movement vectors

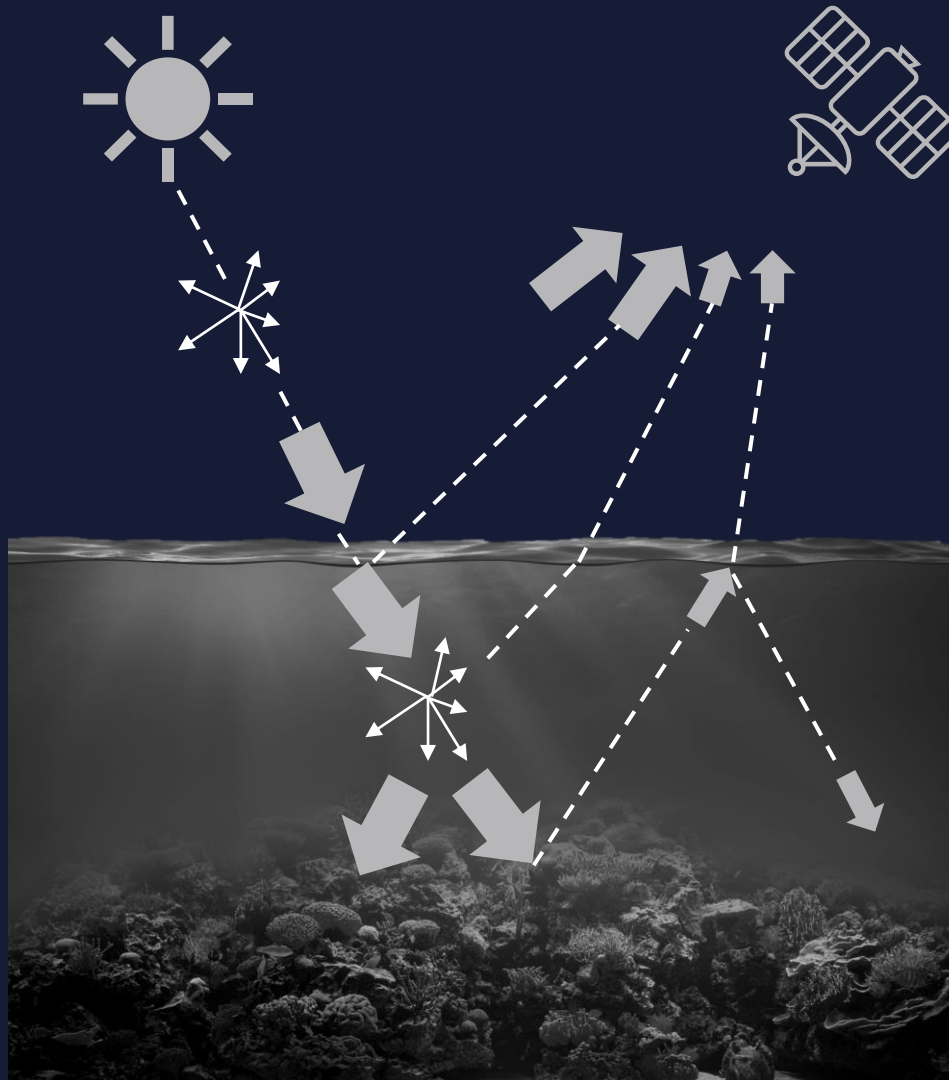


VERTICAL DYNAMICS – SATELLITE-DERIVED BATHYMETRY





## VERTICAL DYNAMICS – SATELLITE-DERIVED BATHYMETRY



**Coast to 1-1.2x Secchi Disc Depth**



**Worldwide applicable**



**Independent of on-site surveys**



**20 years of experience**

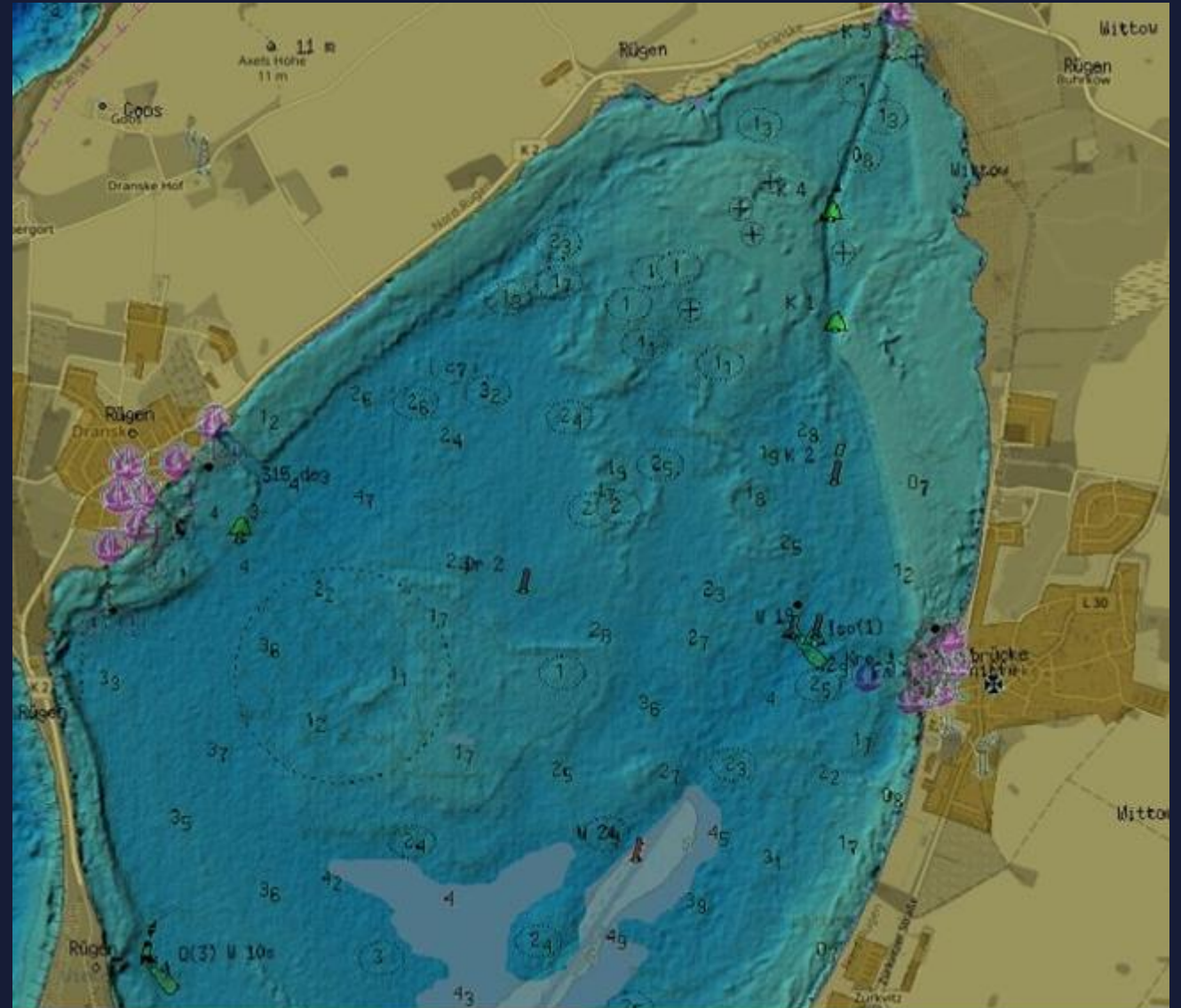
## PHYSICS-BASED OPTICAL SDB GERMAN BALTIC

Depth range: shoreline down  
to 8-12m water depth

Spatial resolution: 1 to 10m  
(Maxar and Sentinel-2 data)

User applications:

- Ecological mapping (for the habitats directive)
- Coastal changes (for coastal resilience strategies)

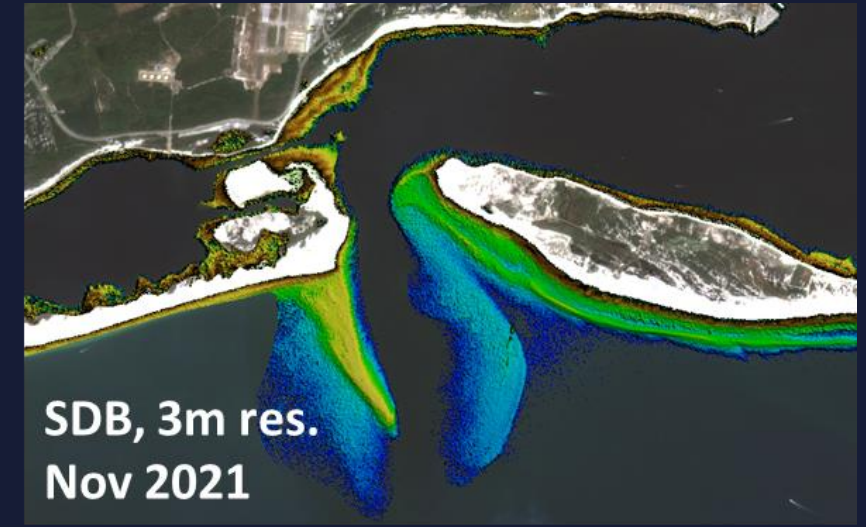
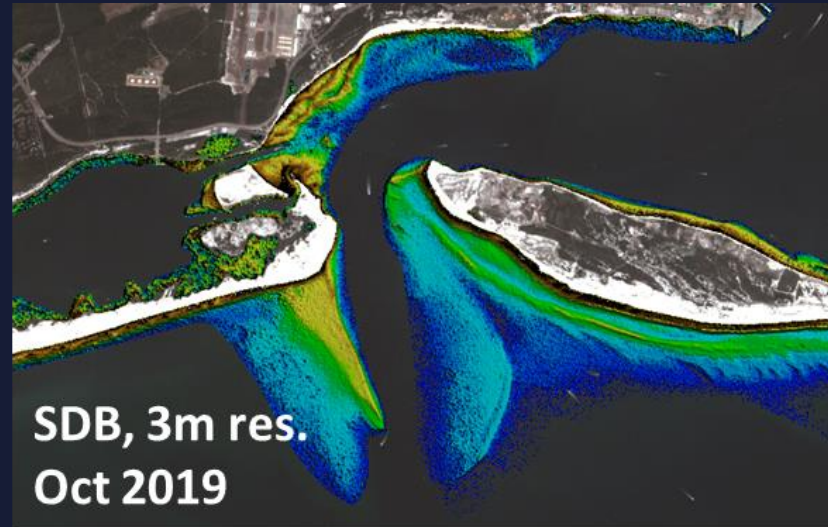


**PHYSICS-BASED OPTICAL SDB**  
**USA, EAST COAST**

**Depth range:**  
shoreline down to  
5-8m water depth

**Spatial resolution:**  
3m (Planet data)

**User applications:**  
- change monitoring  
- gap filling



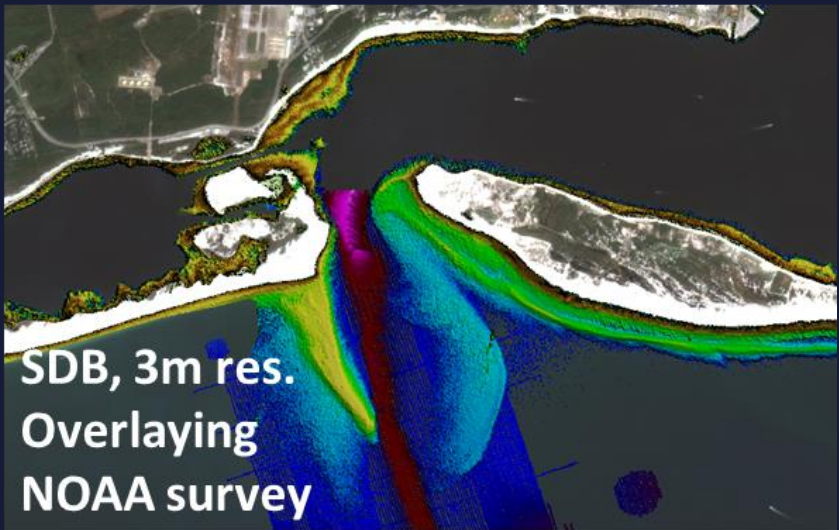
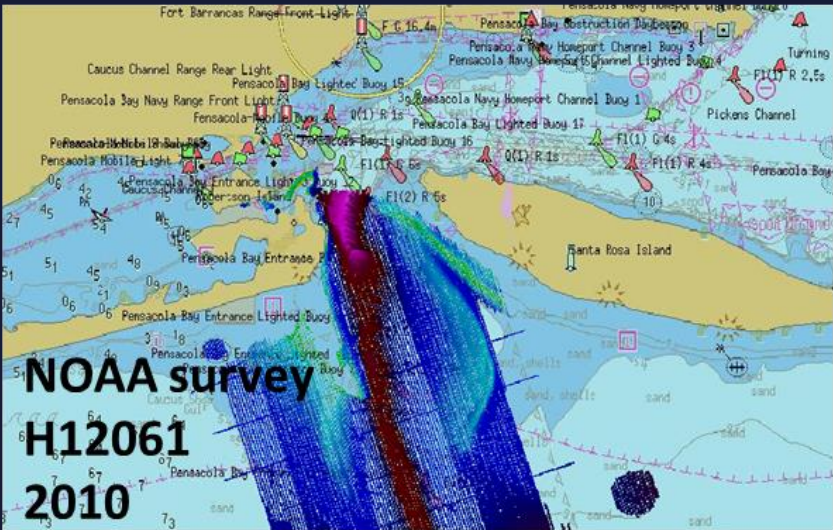
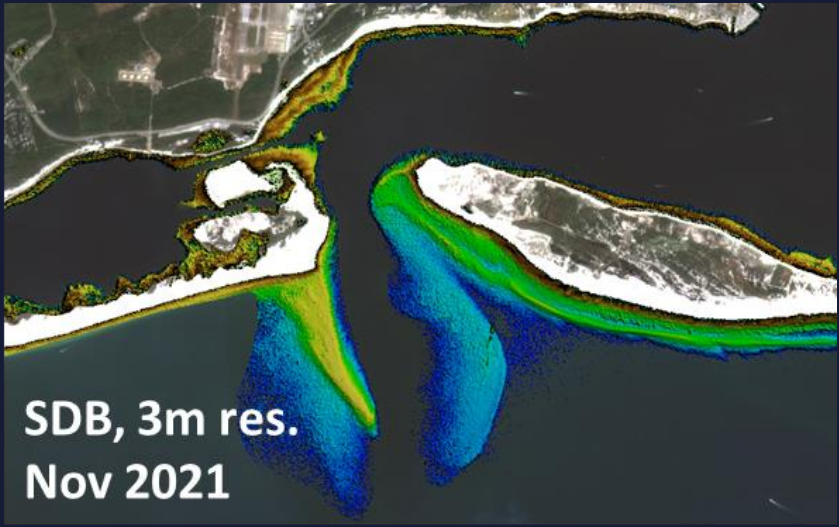
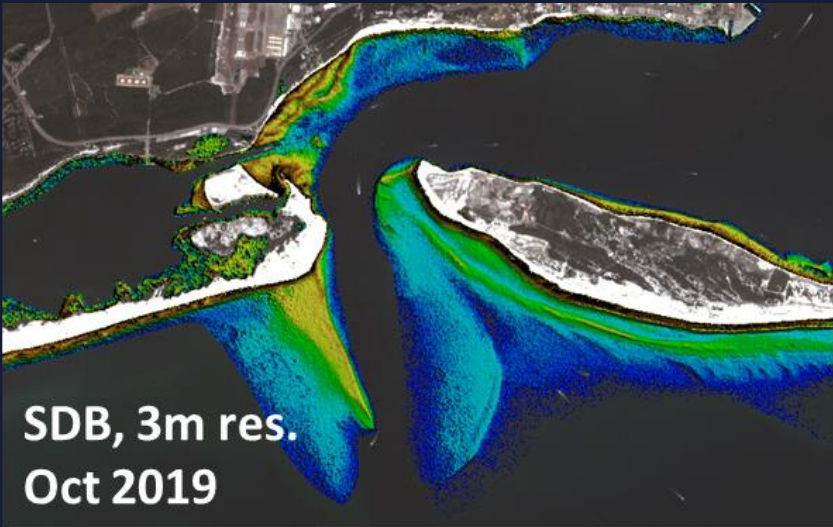


PHYSICS-BASED OPTICAL SDB  
USA, EAST COAST

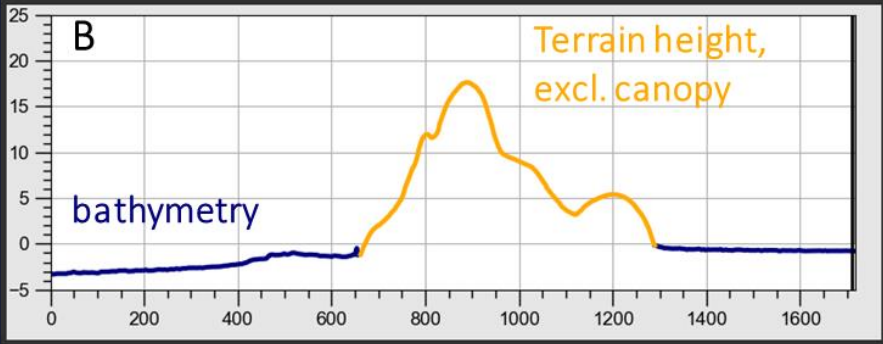
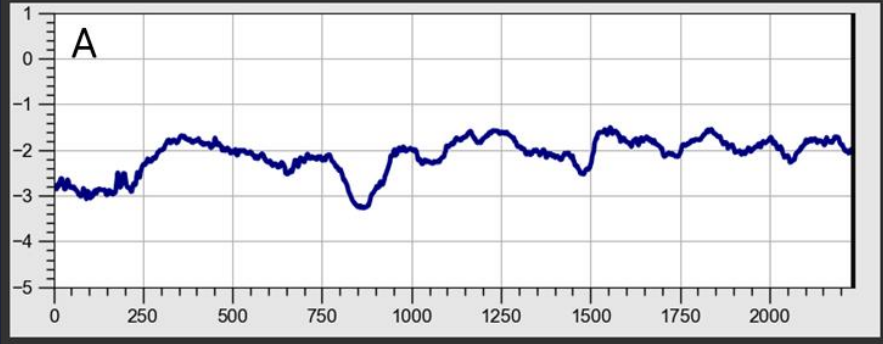
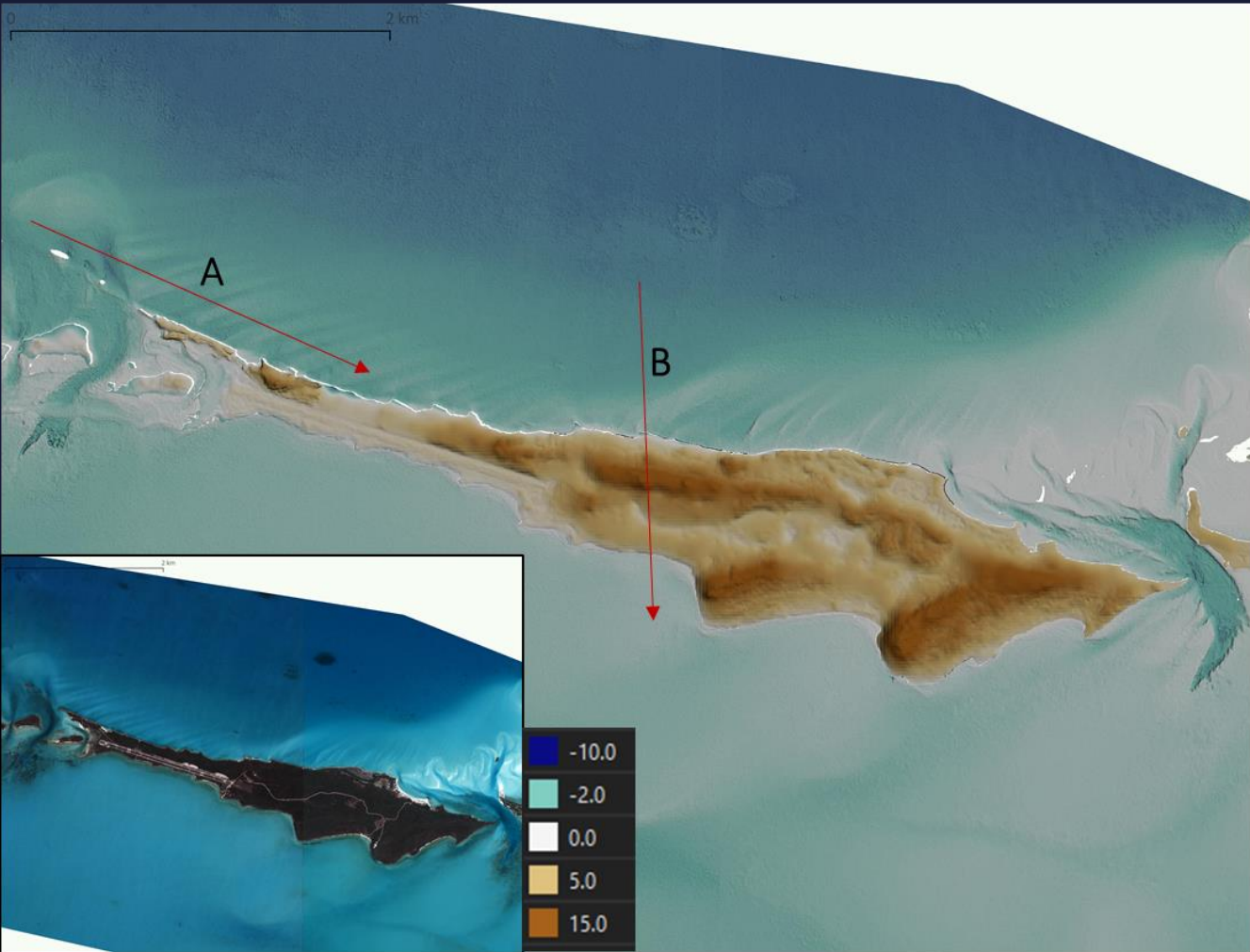
Depth range:  
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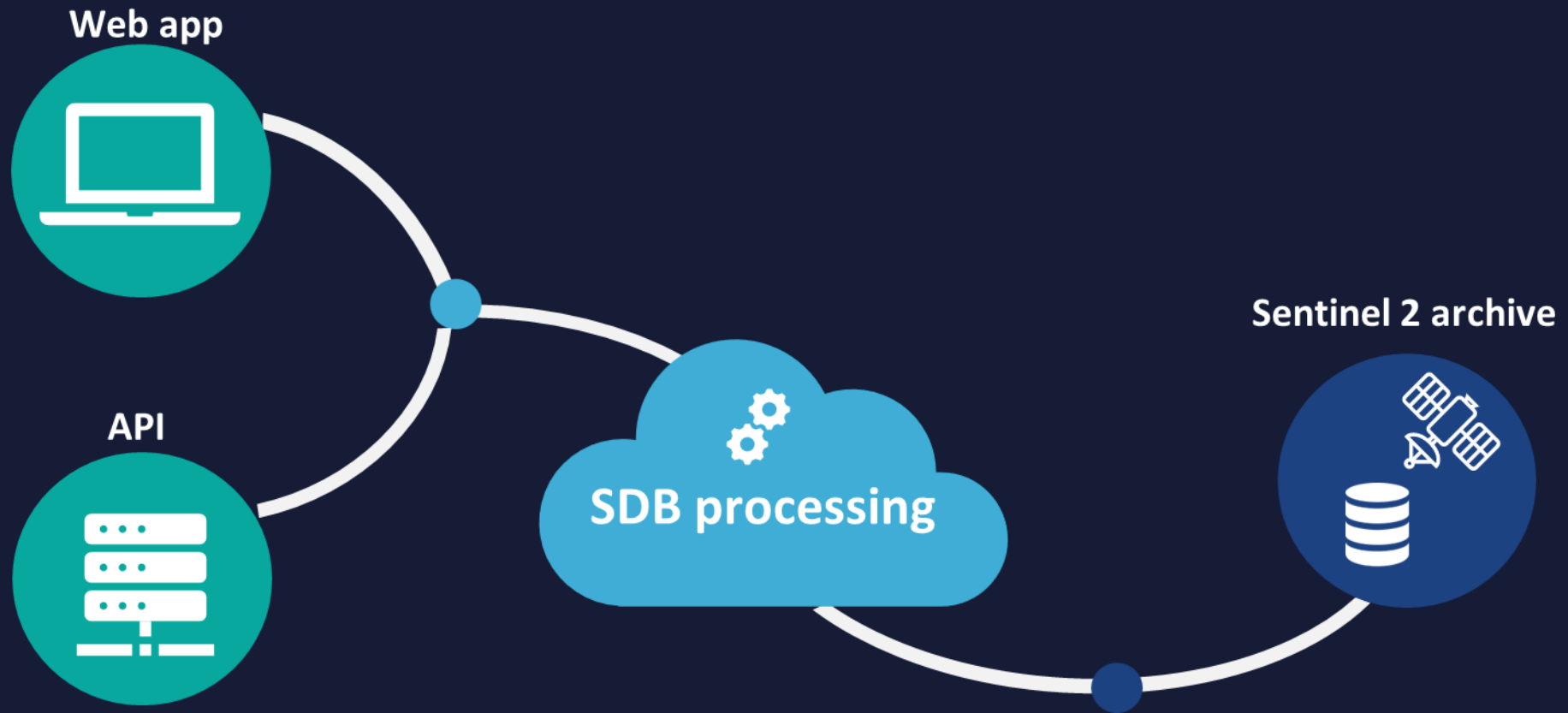
- User applications:
- change monitoring
  - gap filling



# DIGITAL TERRAIN MODEL & SATELLITE-DERIVED BATHYMETRY, HOG CAY BAHAMAS



## CLOUD-BASED SDB





EOMAP

SDBOnline

HELLO DEMO ? 🌐 EN

1 Region


2 Description

3 Checkout

1 - Select Region

Please create your area of interest (AOI). You can either upload, draw or search places.

Search address



↶ ↷

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

✕ CANCEL

CONTINUE

## CLOUD-BASED SDB

sdb-online.eoapp.de



# SDB-Online

HELLO KNUT ▼



EN

🏠 My Regions / Australia 1 / Dynamic\_AUS\_2020

Dynamic\_AUS\_2020

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## Action

2018-05-10 to 2018-09-02 v4



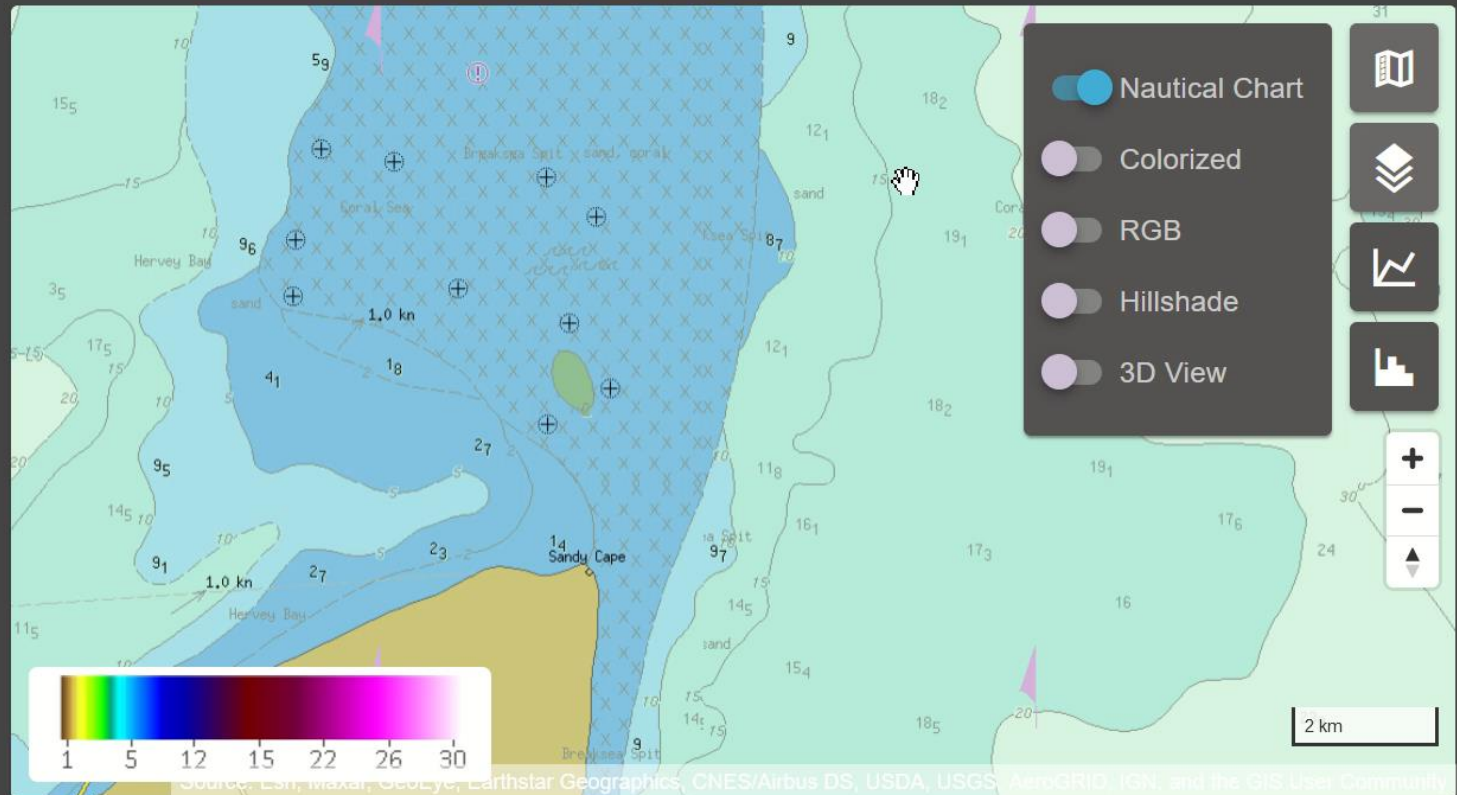
2019-05-05 to 2019-08-18 v2 ...



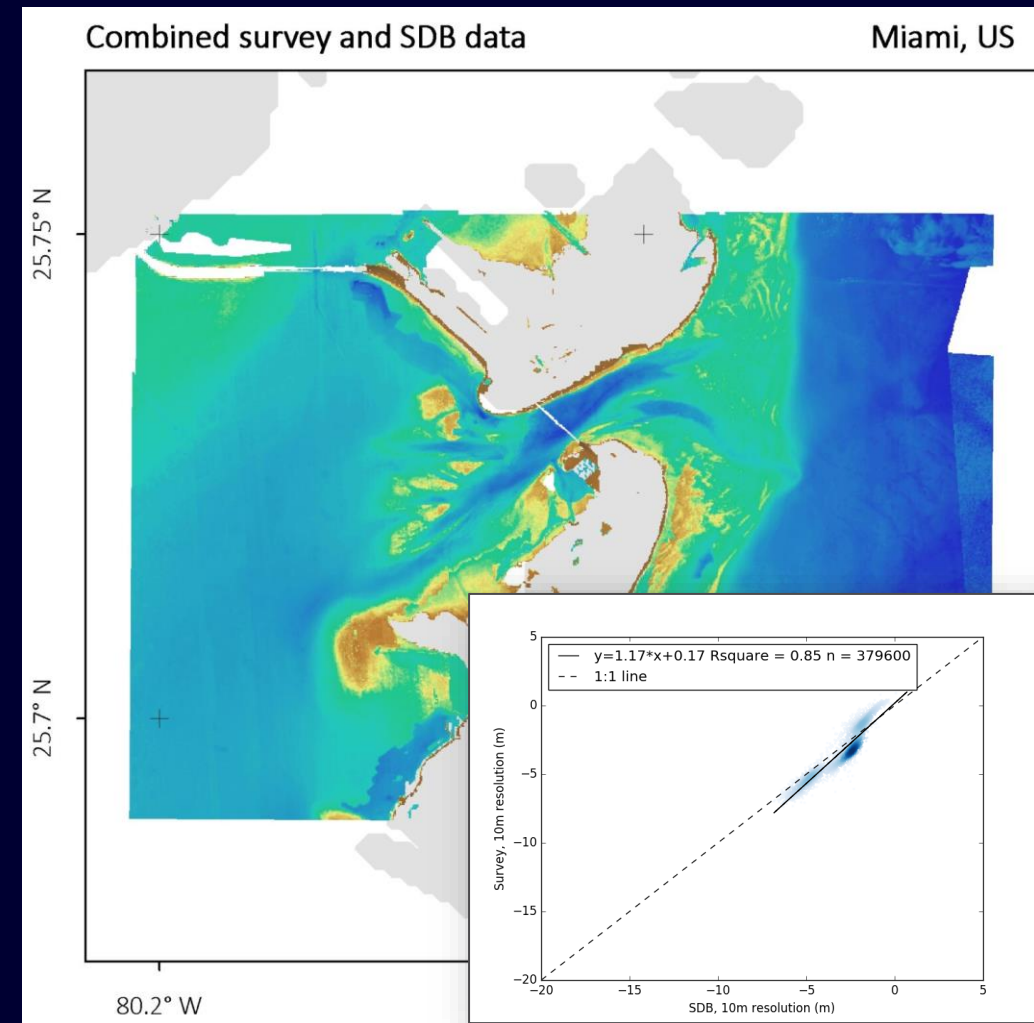
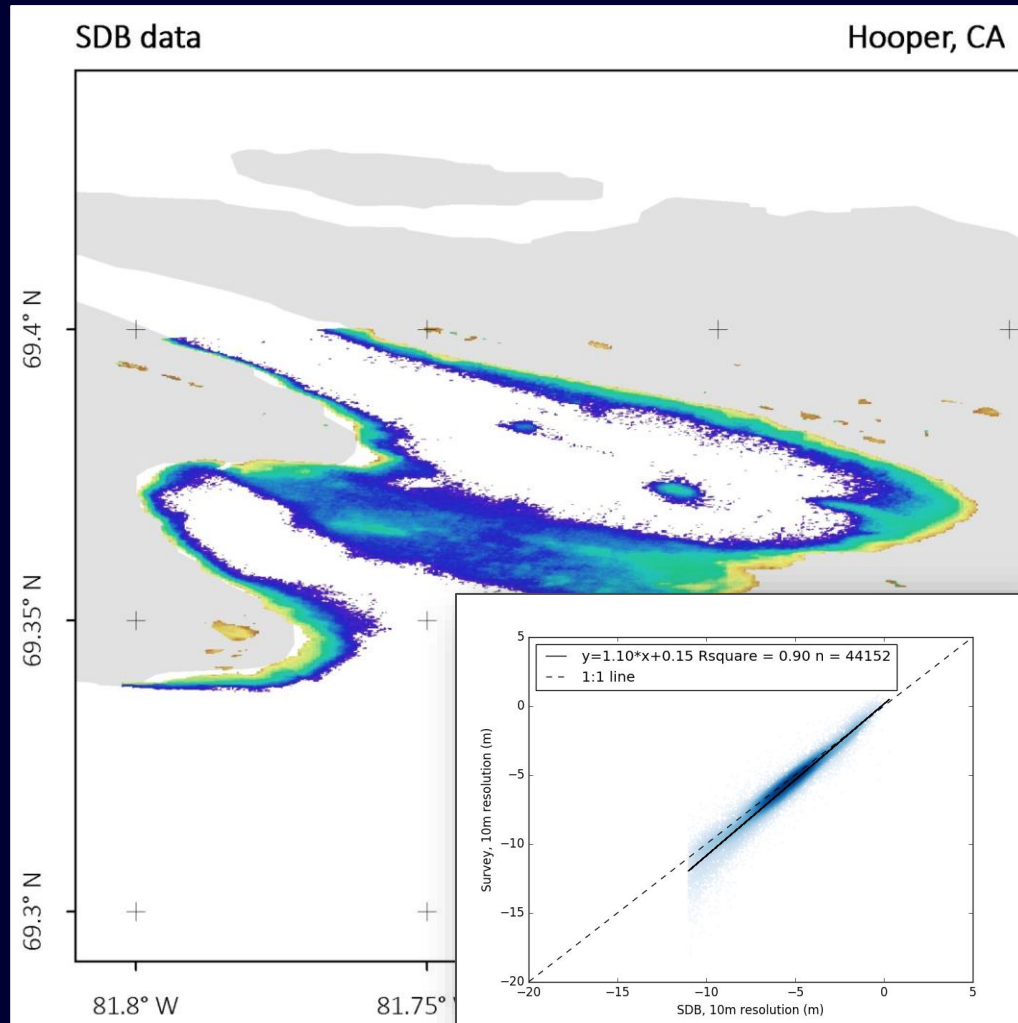
2020-04-24 to 2020-10-01 v1 ...



**START NEW SDB PROCESS**



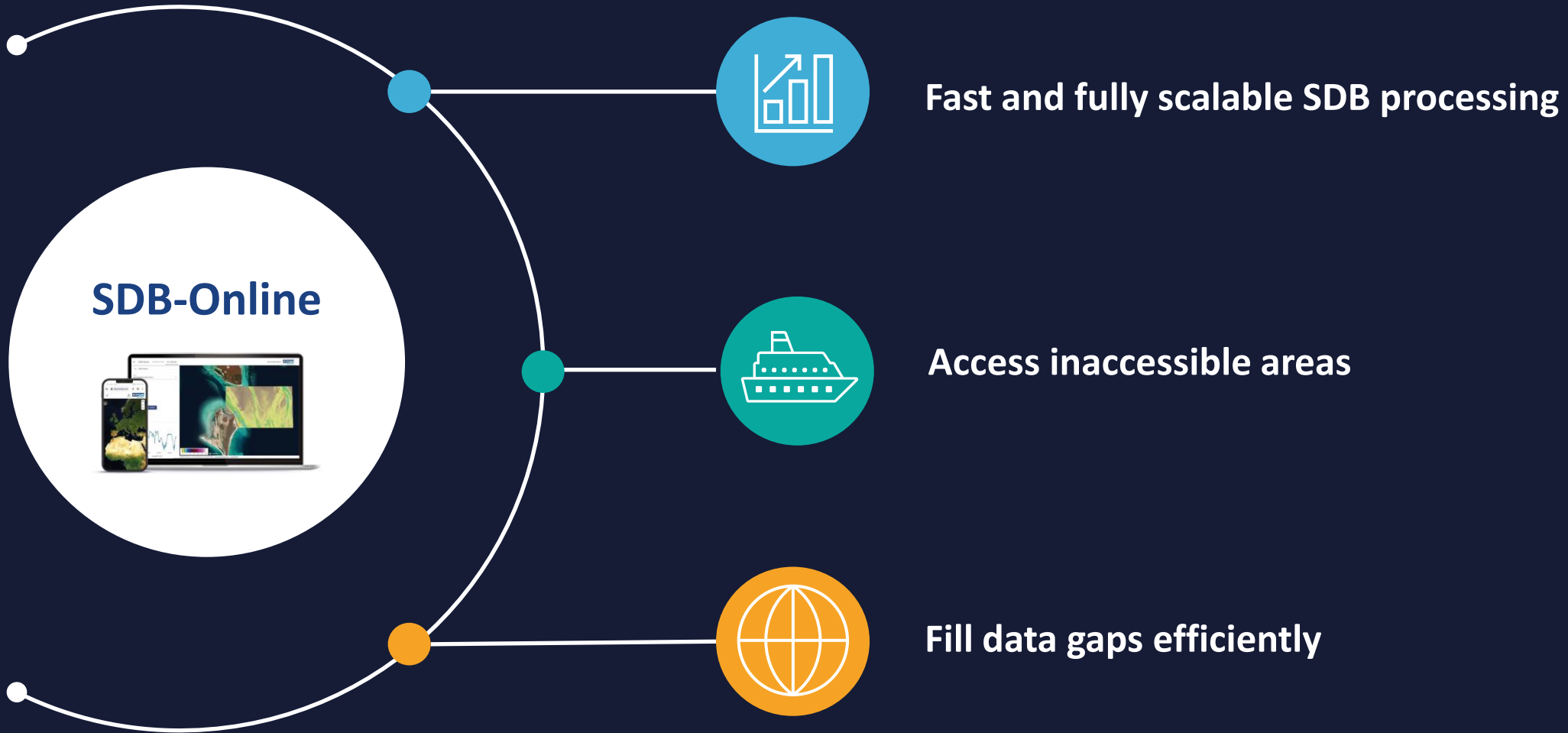
## CLOUD-BASED SDB



Hartmann, K., Reithmeier, M., Knauer, K., Wenzel, J., Kleih, C., Heege, T. (2022). SATELLITE-DERIVED BATHYMETRY ONLINE. The International Hydrographic Review, 28, pp. 53-75. <https://doi.org/10.58440/ihr-28-a14>



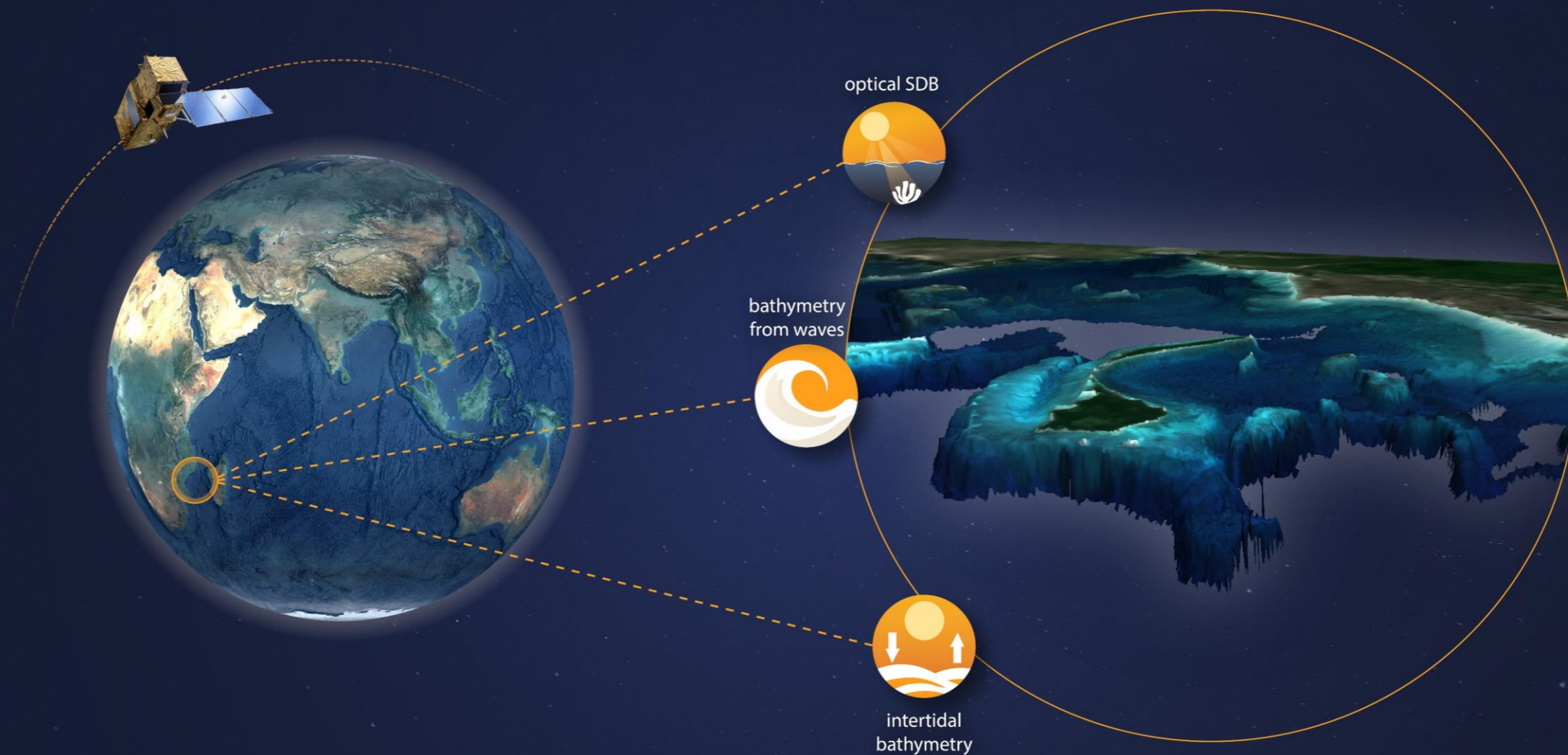
## CLOUD-BASED SDB





**HOW ABOUT  
GLOBAL  
SDB?**

## FILLING COASTAL DATA GAPS - GLOBALLY



*This work is carried out as part of a Copernicus Marine Service contract. Copernicus Marine Service is implemented by Mercator Ocean in the framework of a contribution agreement with the European Union*



## CONCLUSION

- 01 Satellite analytics for mapping and monitoring have reached high level of automation
- 02 The cloud-based platform SDB-Online offers a userfriendly, cost- and time-efficient solution to derive shallow water bathymetry in high resolution
- 03 Global coastal shallow water bathymetry will soon be available in 100m spatial resolution
- 04 Visit [sdb-online.eoapp.de](https://sdb-online.eoapp.de) and visit us at our booth!

THANK YOU FOR YOUR ATTENTION

Hydro 2023

2023-Nov-08 | Mona Reithmeier [reithmeier@eomap.de](mailto:reithmeier@eomap.de)