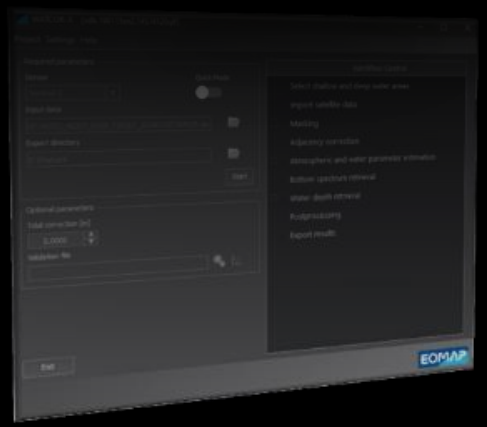
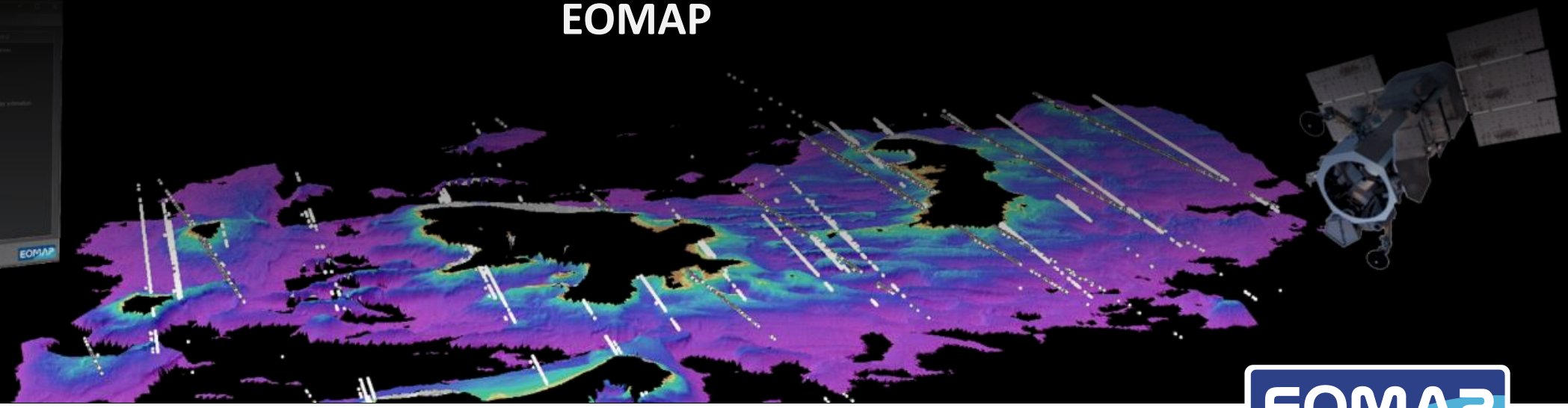
# SDB software, techniques and activities in the MACHC region

## *Software, técnicas y actividades de SDB en la región MACHC*

Virtual MACHC, Nov. 2020

Knut Hartmann & Edward Albada
**EOMAP**







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# EOMAP - Mapping & monitoring aquatic environments

## *EOMAP - Mapeo y monitoreo de ambientes acuáticos*

- Founded in 2006 with HQ in Germany and offices in Australia and USA.
  *Fundada en 2006 con sede en Alemania y oficinas en Australia y USA.*
- Service provider for coastal and offshore stakeholders and top ranked framework provider for hydrographic offices and industry.
  *Proveedor de servicios para partes interesadas costeras y mar adentro y proveedor de marcos de primer nivel por oficinas hidrográficas e industria*
- EOMAP's SBD data are found in nautical charts, EU bathymetry grids, GEBCO and day-to-day use of coastal stakeholders.
  *Los datos SBD de EOMAP se encuentran en cartas náuticas, cuadrículas batimétricas de la UE, GEBCO y el uso diario de las partes interesadas costeras.*

EU SME champion

EU awards for technology, 2011 and 2013

Geospatial world award winner 2017

Information Program Partner

Data provider



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# Content of this session

1. What is Satellite-Derived Bathymetry?
   *¿Qué es la batimetría derivada de satélites?*
2. How to get started, even with little resources?
   *¿Cómo empezar, incluso con pocos recursos?*
3. Can I trust SDB data? How can I verify accuracies?
   *¿Puedo confiar en los datos SDB? ¿Cómo puedo verificar las precisiones?*
4. What are recent SDB activities for the MACHC region?
   *¿Cuáles son los casos de uso y las actividades recientes de SDB para la región MACHC?*



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# What is optical Satellite-Derived Bathymetry?

## *¿Qué es la batimetría derivada de satélites?*



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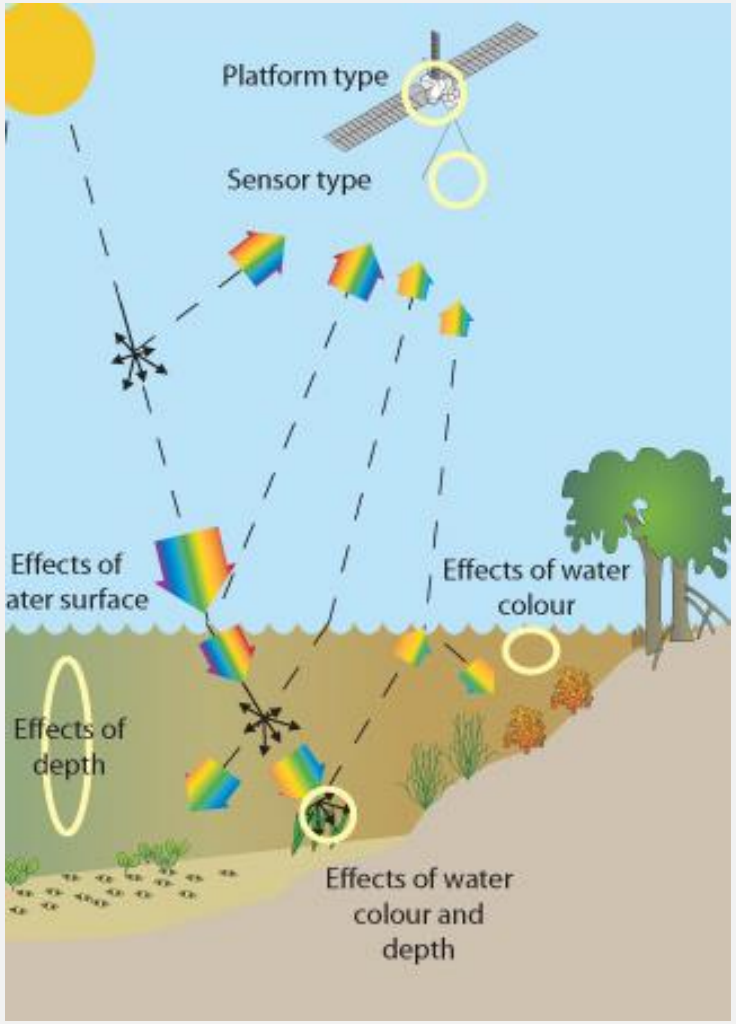
# What is optical Satellite-Derived Bathymetry (SDB)?




SDB calculates water depth using the reflected sunlight from the seafloor by physical sunlight inversion modelling.

*SDB calcula la profundidad del agua utilizando la luz solar reflejada del lecho marino mediante un modelo de inversión física de la luz solar.*

Water depth is a function of:

*f(atmosphere, adjacency, water surface, absorbers and backscatters of the water column, seafloor, seastate, sun and sensor geometry, SNR ratio)*



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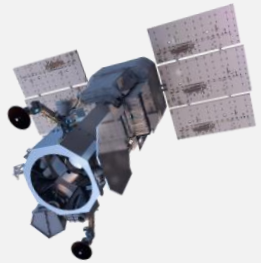
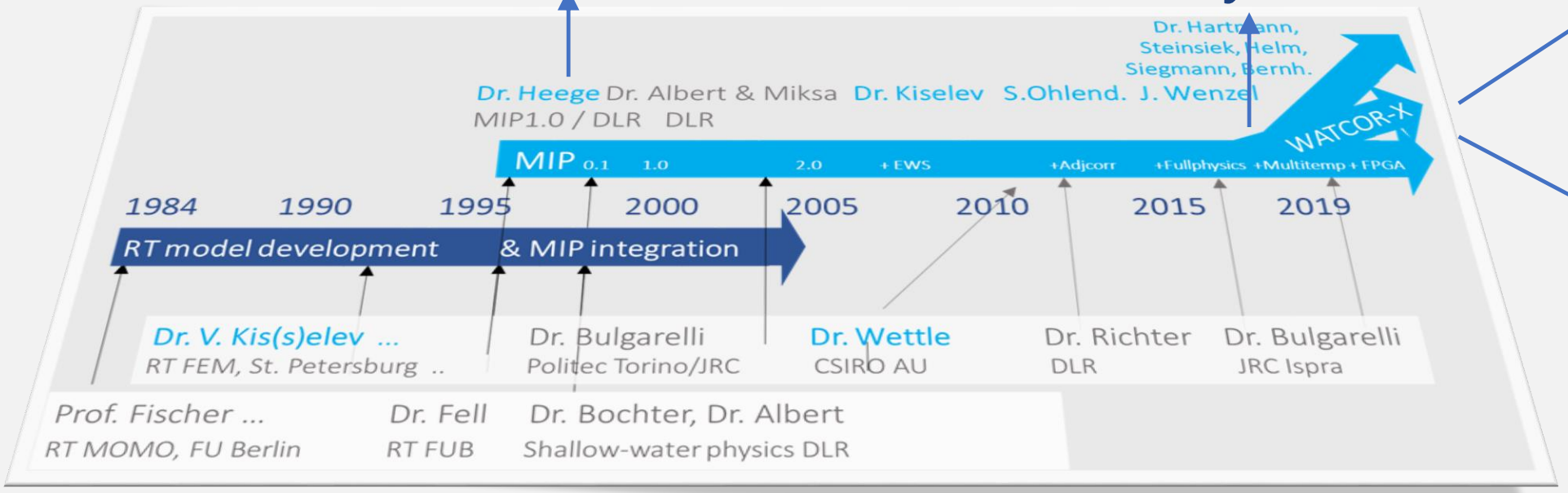
# EOMAP physics based SDB history



Single record analytics

Multi record, multi sensor analytics




Desktop software

Online software



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# How to get started, even with little resources?

## *¿Cómo empezar, incluso con pocos recursos?*



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# SDB data and SDB software services

**EOMAP's data services** provide dense shallow water bathymetry data for the Caribbean from 1-10m spatial resolution.

*Los servicios de datos de EOMAP proporcionan datos densos de batimetría de aguas poco profundas para el Caribe con una resolución espacial de 1 a 10 m.*

*Simply reach out to shallowwater@eomap.de*

*Contacto: shallowwater@eomap.de*

**EOMAP's SDB software** provides entities with the ability to generate SDB data themselves, anytime and as required.

*l software SDB de EOMAP proporciona a las entidades la capacidad de generar datos SDB ellos mismos, en cualquier momento y según sea necesario.*


Introduction in the next slides!

*¡Introducción en las próximas diapositivas!*



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# Professional software packages for SDB
## *Paquetes de software profesionales para SDB*

### Underlying requirements on EOMAP's SDB solution:
***Requisitos subyacentes de la solución SDB de EOMAP:***

Easy to use, even for none experts in SDB → great user experience
*Fácil de usar, incluso para ninguna experta en SDB → gran experiencia de usuario*

No dependencies on costly third party hard or software → affordable, great value for money
*Sin dependencias de costosos hardware o software de terceros → asequible, gran valor por dinero*



Reliable, standardised and transparent SDB outputs → highest quality
*Salidas SDB fiables, estandarizadas y transparentes →* de la máxima calidad



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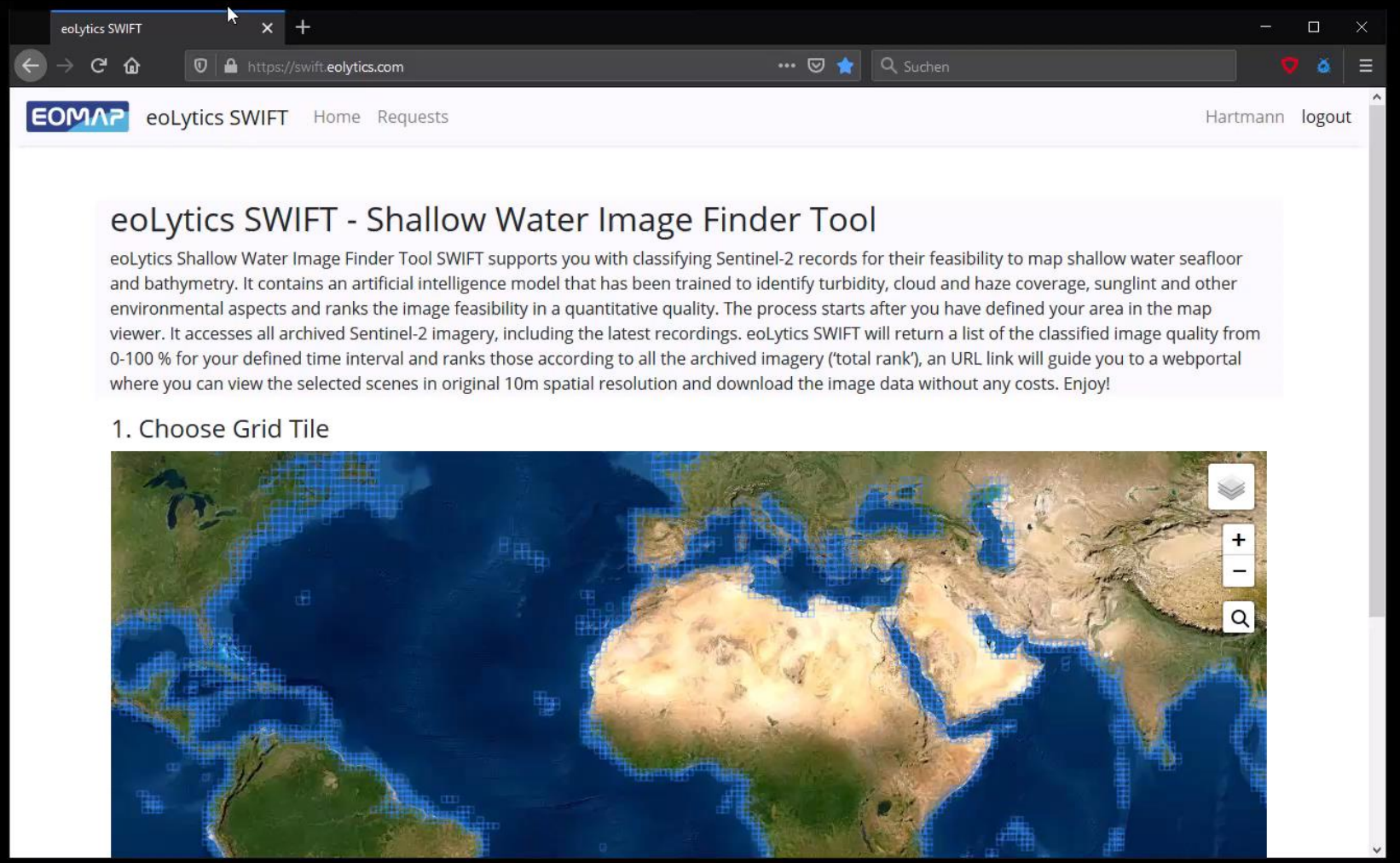
# Finding and accessing satellite data for SDB

## *Acceso a datos satelitales para SDB*



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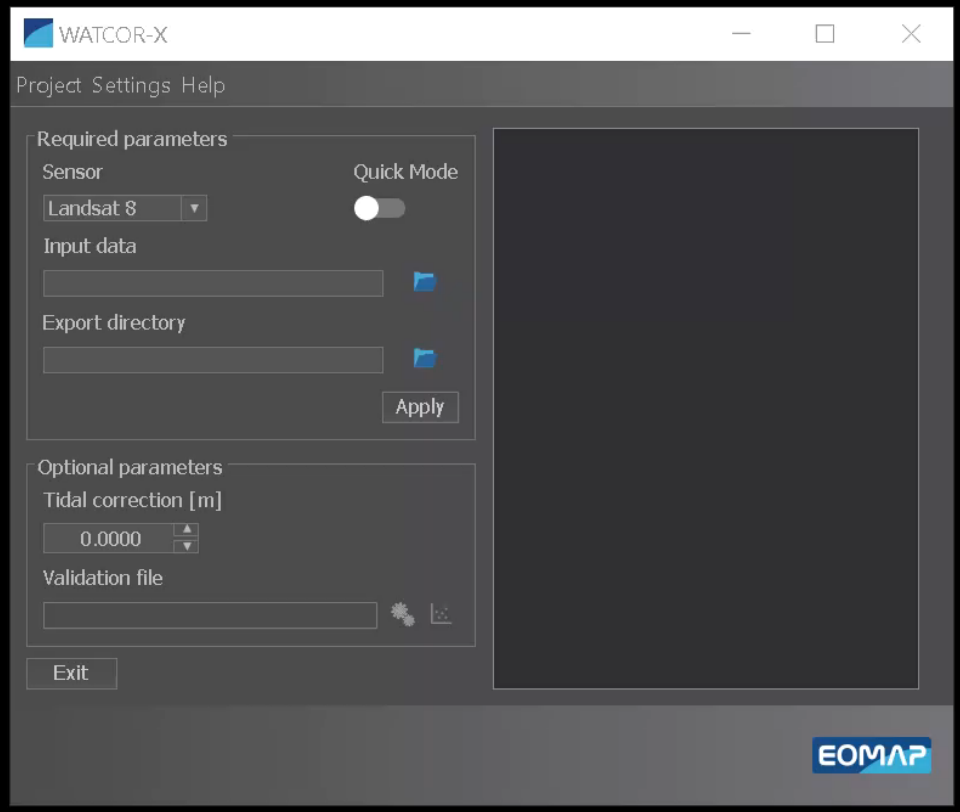
# WATCOR-X – Desktop software for SDB analysis



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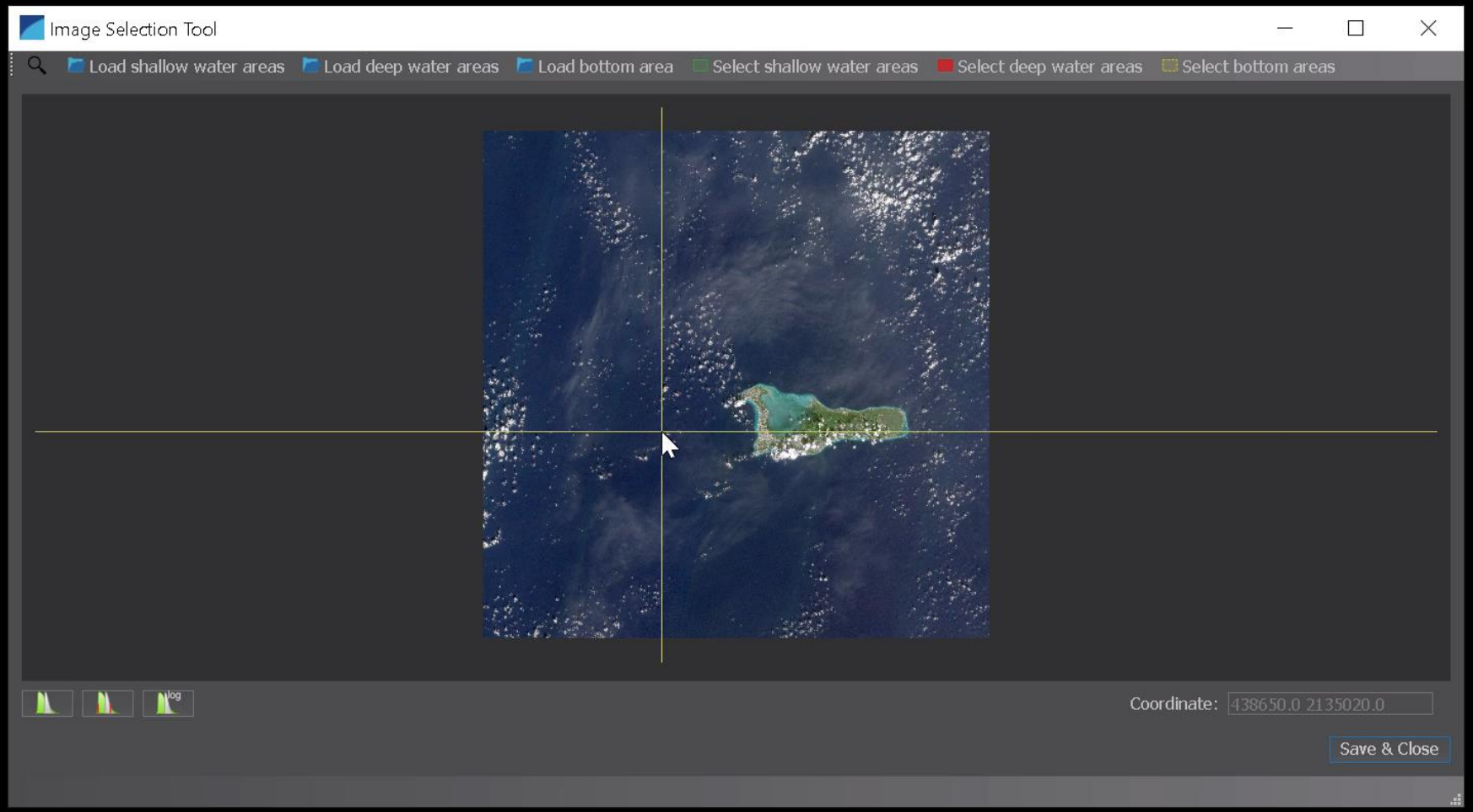
# WATCOR-X – Desktop software for SDB analysis



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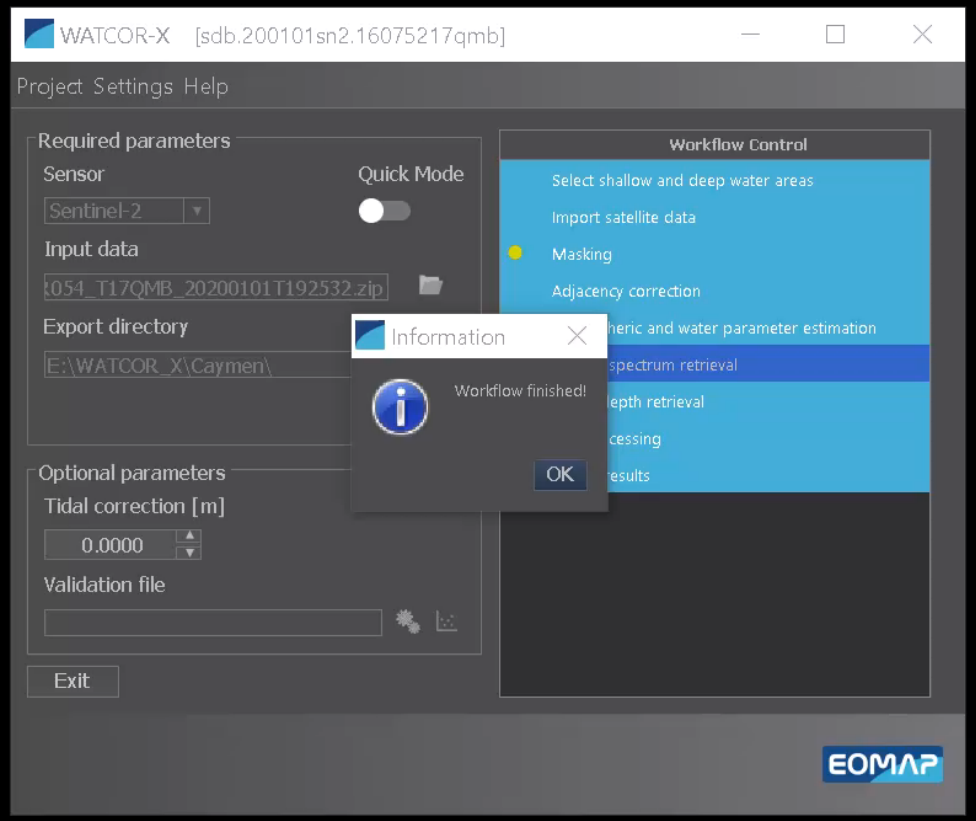




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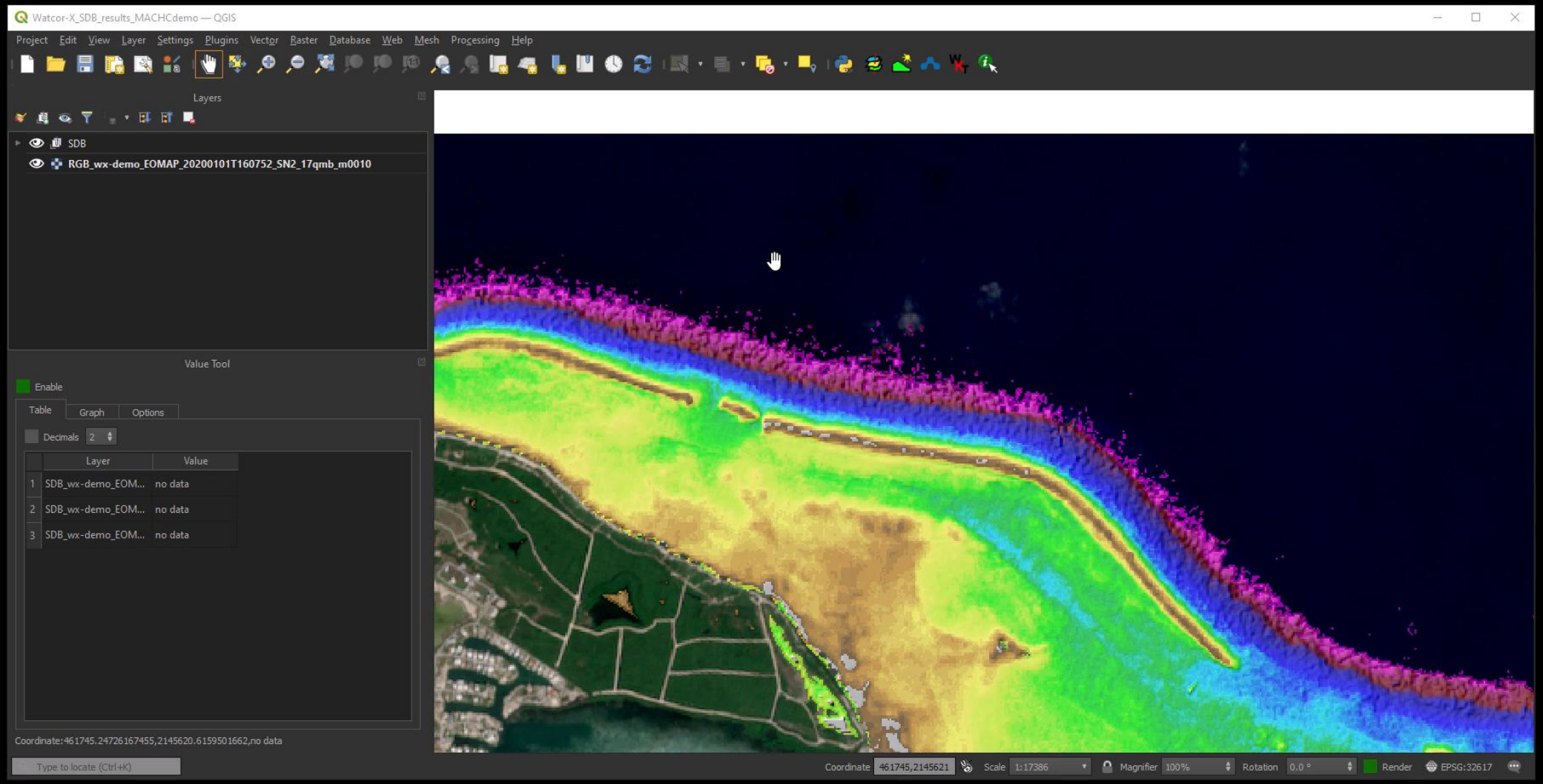
# WATCOR-X – Desktop software for SDB analysis



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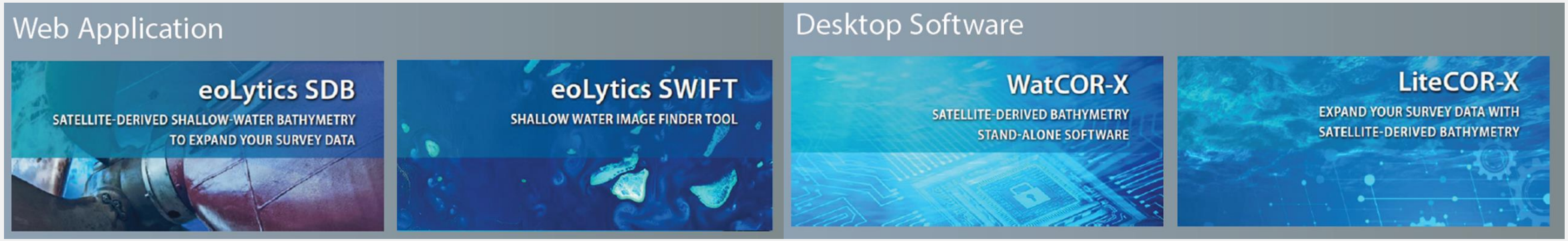
# Satellite-Derived Bathymetry software

**In addition** we provide cloud based SDB software (**eoLytics SBD**).
It can be accessed through a webapp. You only need your browser!
*Además, proporcionamos software SDB basado en la nube (eoLytics SBD).*
*Se puede acceder a través de una aplicación web. ¡Solo necesitas tu navegador!*

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# Can I trust SDB data? How can I verify accuracies?

## *¿Puedo confiar en los datos SDB? ¿Cómo puedo verificar las precisiones?*



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# Verification of SDB results
## *Verificación de resultados SDB*

### Internal SDB model checks
### *Comprobaciones internas del modelo SDB*

- SDB model vertical uncertainties
  *Incertidumbres verticales del modelo SDB*
- Internal quality checks of derived information on atmosphere, water column, etc.
  *Comprobaciones internas de calidad de la información derivada sobre atmósfera, columna de agua, etc.*

### External SDB checks
### *Comprobaciones SDB externas*

- On-site data verification with acoustic data (few single beam transects are sufficient)
  *Verificación de datos in situ con datos acústicos (pocos transectos de un solo haz son suficientes)*
- Comparison with Satellite-Lidar Bathymetry (SLB), database accessible through EOMAP
  *Comparación con Batimetría Satélite-Lidar (SLB), base de datos accesible a través de EOMAP*



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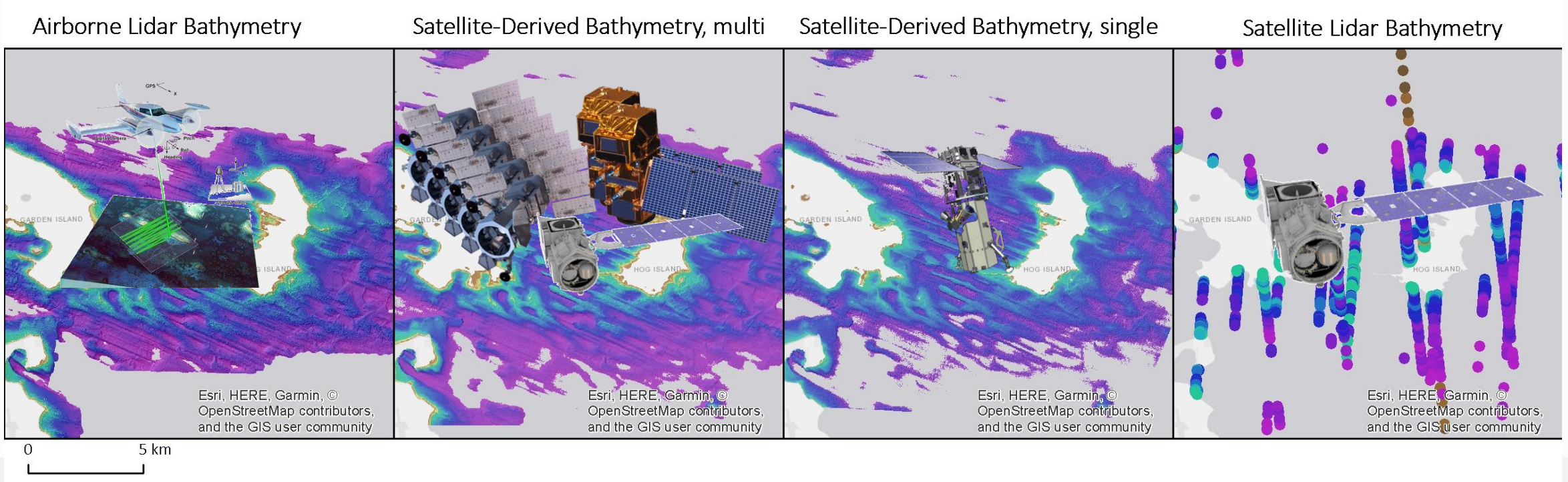
# Recent developments and verifications
## *Desarrollos y verificaciones recientes*

$SDB_{multi}$ is EOMAP's new and patented concept based on multiple sensor and multiple scenes SDB calculation.

→ Higher confidence and verified results using global satellite Lidar bathymetry data.

*$SDB_{multi}$ es el concepto nuevo y patentado basado en el cálculo de múltiples sensores y múltiples escenas SDB.*

*→ Mayor confianza y resultados verificados utilizando datos batimétricos globales de satélite Lidar.*



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# Publications on EOMAP's SDB and software solutions

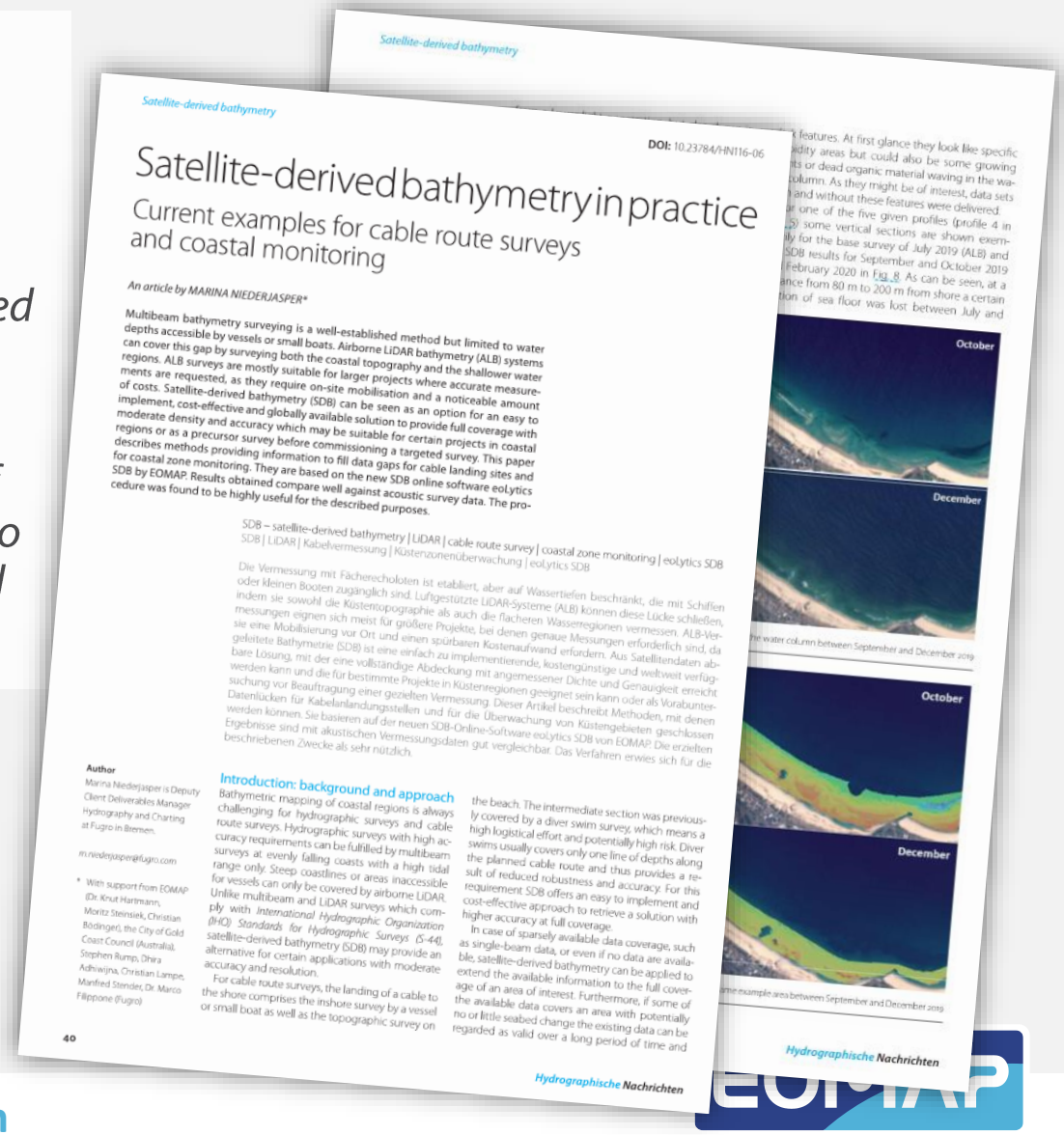
Available **publications and third party validations**

## User testimonials:

*The processing procedure is **easy to apply**.*

*The [SDB] procedure was found to be **highly useful** for the described purpose [shallow water monitoring and surveying]*

*I see a lot of value in this tool [eoLytics SWIFT] for **reducing the amount of time it takes to produce SDB**, reduce the amount of knowledge new analysts would require to get processing and also preserves the image selection capability irrespective of personnel changes.*




**Contact us for details**



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# What are recent SDB use cases and activities for the MACHC region?

## *¿Cuáles son los casos de uso y las actividades recientes de SDB para la región MACHC?*



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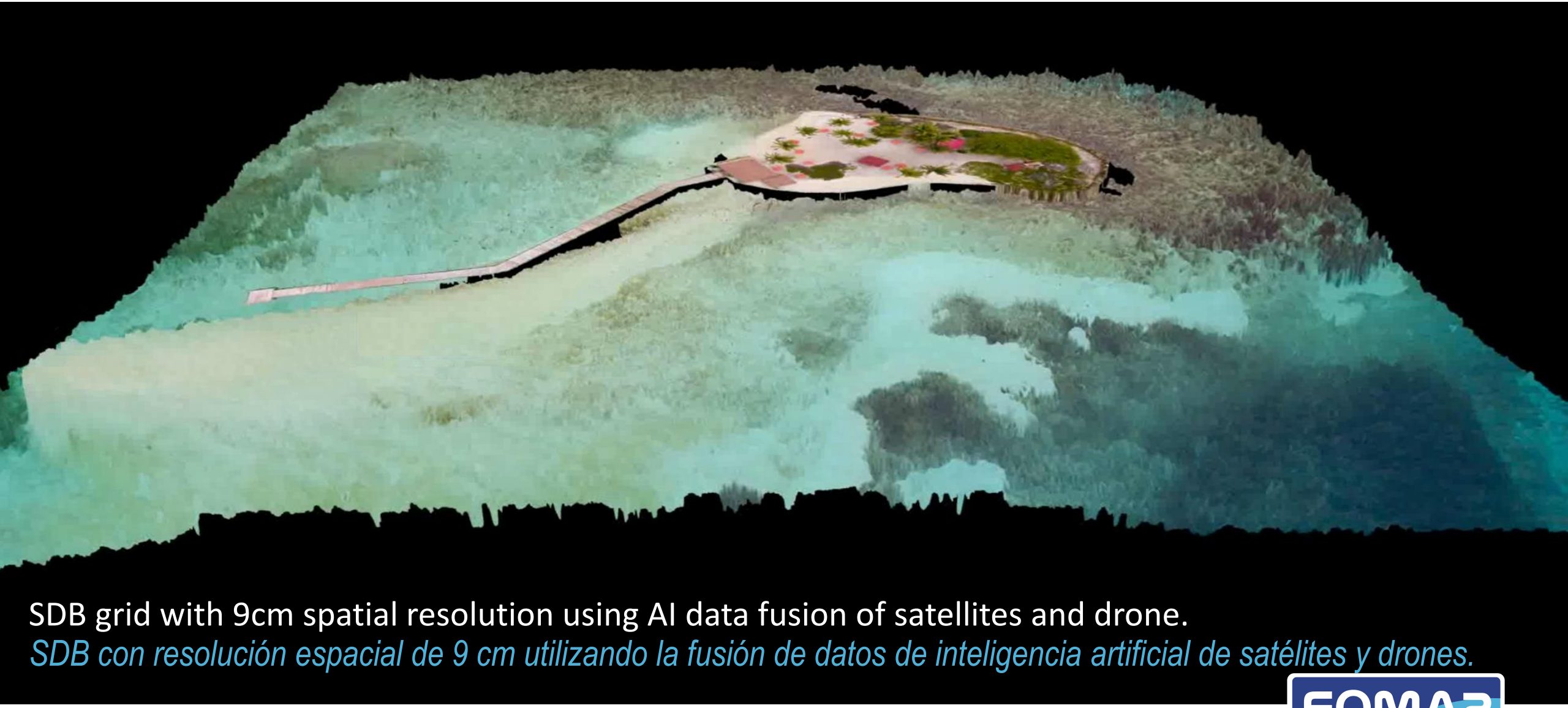
# Extreme high resolution SDB data fusion with drones using AI!



SDB grid with 9cm spatial resolution using AI data fusion of satellites and drone.

*SDB con resolución espacial de 9 cm utilizando la fusión de datos de inteligencia artificial de satélites y drones.*



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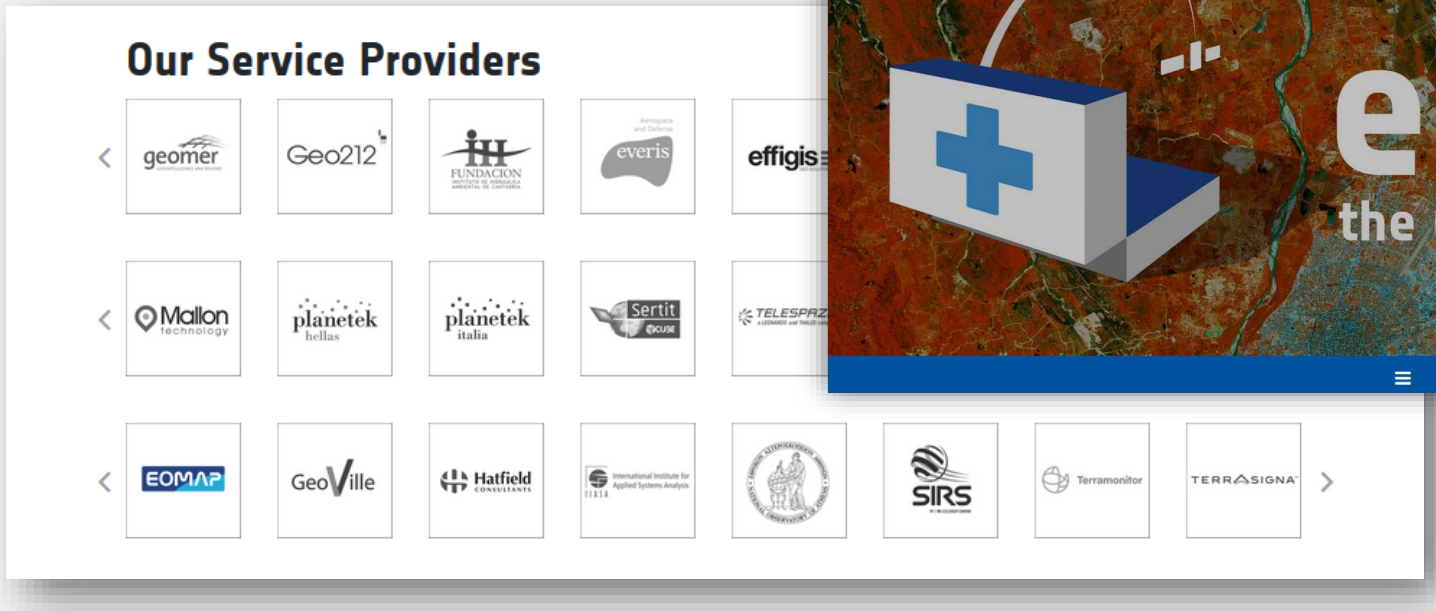
# Apply to get 100% financial support!

## *¡Puedes postularte para obtener el 100% de apoyo financiero!*

**Simply fill in an online questionnaire!**

*¡Simplemente complete un cuestionario en línea!*

https://eo4society.esa.int/eo_clinic/







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# The EU innovation program Horizon 2020 launches 4S

Co-funded by the European Union

**The EU innovation program co-funds 4S** (Satellite Seafloor Survey Suite), starting 1st Nov 2020 to increase knowledge on shallow water morphology and seafloor!

*El programa de innovación de la UE cofinancia 4S (Satellite Seafloor Survey Suite), a partir del 1 de noviembre de 2020 para aumentar el conocimiento sobre la morfología de las aguas poco profundas y el fondo marino.*

**Caribbean entities can participate free of charge and commitments and tailor the solution! Contact the coordinator at 4s.horizon@eomap.com**

***¡Las entidades caribeñas pueden participar sin cargo y compromisos y adaptar la solución! Póngase en contacto con el coordinador en 4s.horizon@eomap.com***



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# EMODnet Bathymetry expands to the Caribbean!

## *¡EMODnet Bathymetry se expande al Caribe!*

The European project (49 hydrographic entities) to generate and distribute bathymetric data is **expanding to the Caribbean**! SDB data will be available for different Caribbean nations! Contact hartmann@eomap.de to get further details.


*¡El proyecto europeo (compuesto por 49 entidades hidrográficas) para generar y distribuir datos batimétricos armonizados se está expandiendo al Caribe! ¡Los datos SDB estarán disponibles para diferentes países del Caribe! Póngase en contacto con hartmann@eomap.de para obtener más detalles.*



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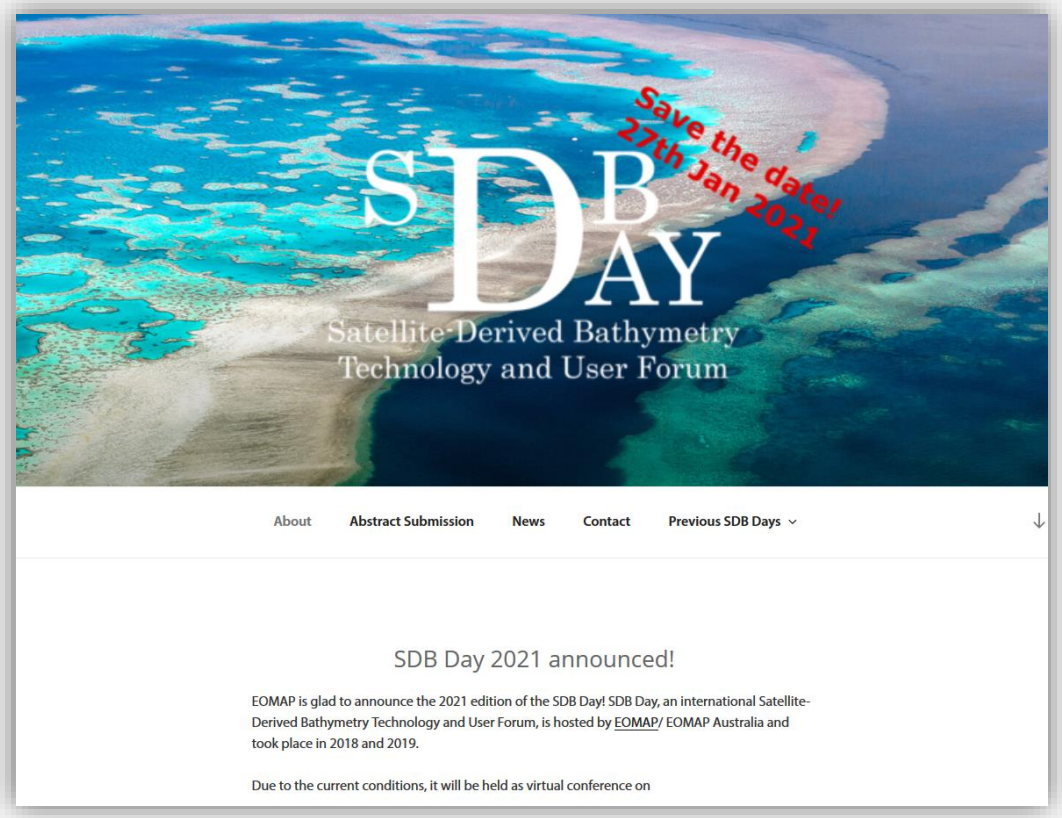
# SDB Day 2021 – 27th Jan. 2021

The 3rd international conference on Satellite-Derived Bathymetry
**SDB DAY 2021** will be held virtually!
*¡La tercera conferencia internacional sobre SDB se llevará a cabo* virtualmente!

**Save the date!**
**sdbday.org/**



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# Thank you for your attention and interest!

Contact us anytime: eomap.com

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## *¡Gracias por su atención e interés!*

*Contáctenos en cualquier momento: eomap.com'*

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