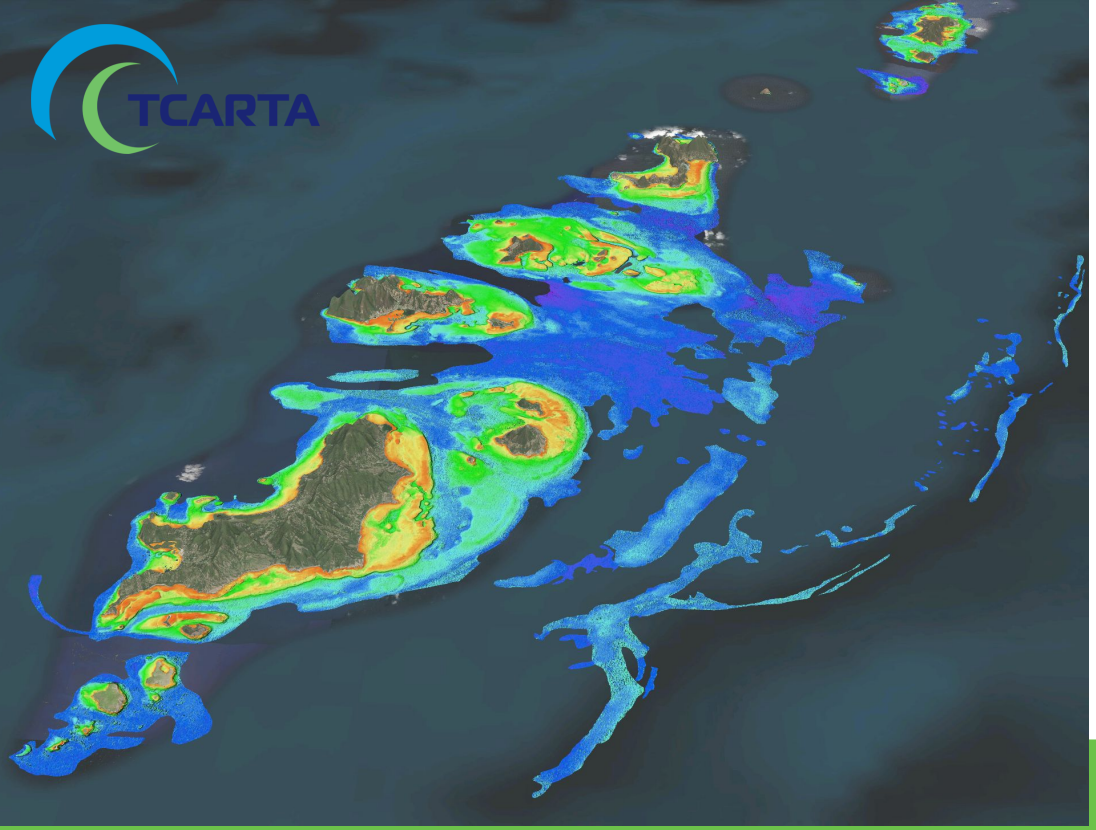
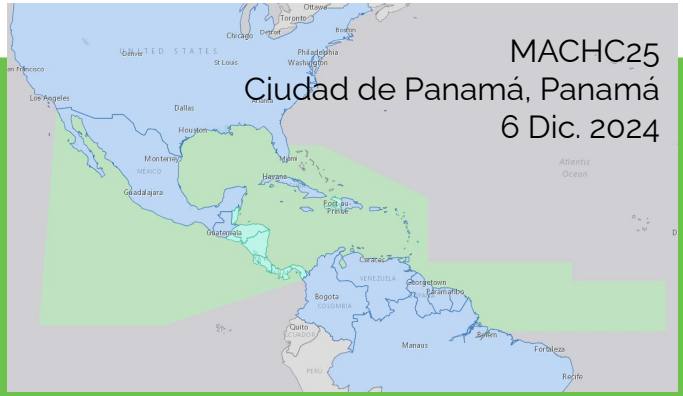


Aplicaciones de Mapeo Basado en Satélite y desarrollo de habilidades hidroespaciales en la región del Caribe

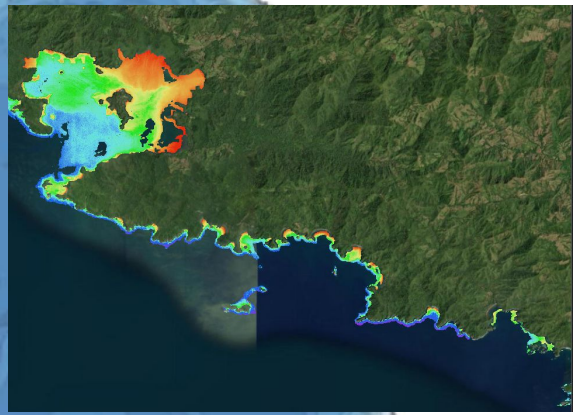
Kyle Goodrich
Fundador
kyle@tcarta.com

David Bautista
Director de Proyectos Hidroespaciales
david@tcarta.com



Agenda

1. **Capas Espaciales Marinas de Referencia**
   Datos espaciales nacionales en Jamaica
2. **Panel de seguimiento del sargazo** - Fondo de Fomento del Turismo (TEF), Jamaica
3. **Cartas de reconocimiento satelital**
4. **Toolbox Batimetría Derivada por Satélite**
5. **Seabed 2030 Talleres & desarrollo de habilidades SDB**



Capa Base Marinas por País-Amplia Plataforma Geoespacial

Capas de Datos Espaciales Marinos de Jamaica

- Mapa Base Temático Marino
- Imágenes Satelitales Libre de Nubes
- Batimetría Costera
- 90m Modelo Digital de Batimetría

Para uso general y visualización pública

Mapa Base Marino de Jamaica

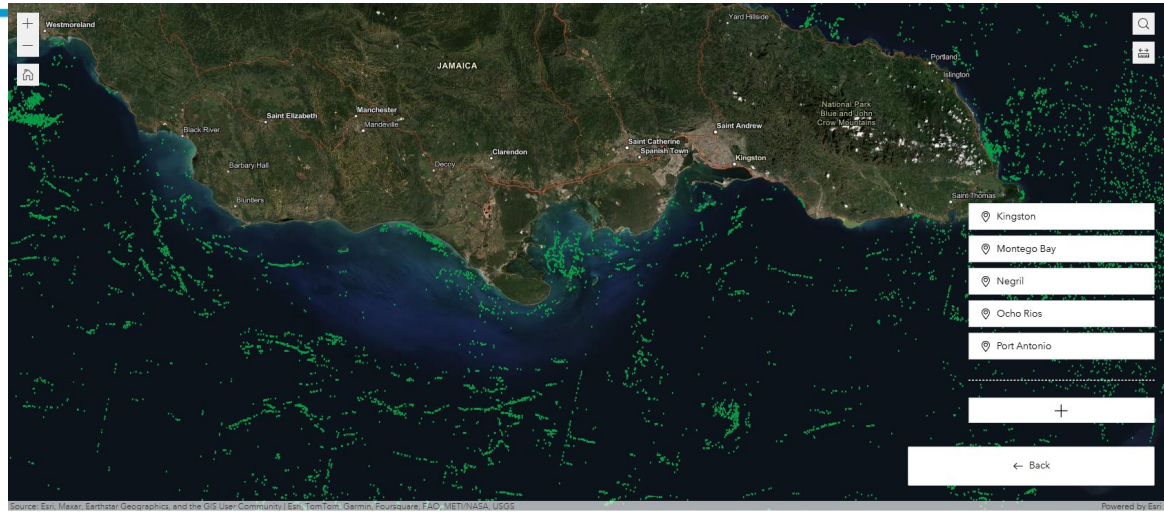
Aplicación Web para el Seguimiento del Sargazo

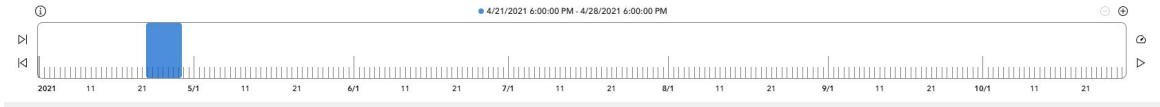
Capas de Datos Espaciales Marinos de Jamaica

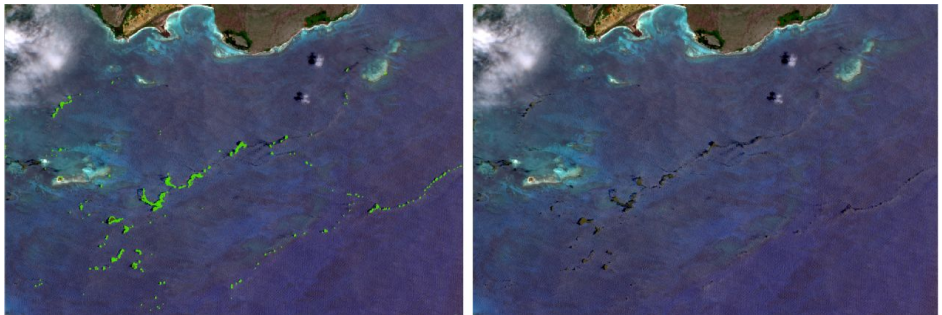
- Fase 1: Imágenes de Libre Acceso
- Panel con Imágenes Históricas
- Visualización de Esteras de Sargazo

Tourism Enhancement Fund
Tourism dollars working for you.

Para uso general y visualización pública







Cartas de Reconocimiento

Superficie Batimétrica

Formateado según las necesidades del cliente. Precisión horizontal de 5 m y profundidad del 10 % +/- 0,5 m vertical

Clasificación del Fondo Marino

Para evaluar la idoneidad del sitio para la pesca, anclaje o métodos de levantamiento

Atributos

Ayudas a la navegación y otros atributos náuticos según disponibilidad

Curvas de Nivel

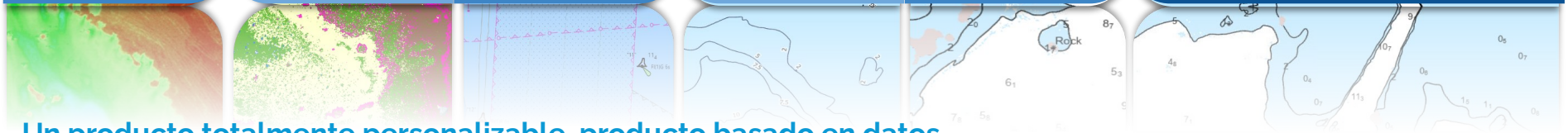
Derivado de la superficie batimétrica, se puede producir hasta con un intervalo de 1 m.

Sondeos

Derivado de la superficie batimétrica, Densidad ajustada según la escala de la carta

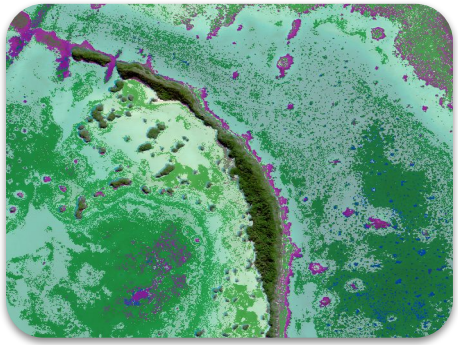
Cartas de Reconocimiento Satelital

- Mapa web hospedado en la nube
- Compatible con SIG en formatos geoTIFF y vectoriales
- S-100, S-57
- PDF



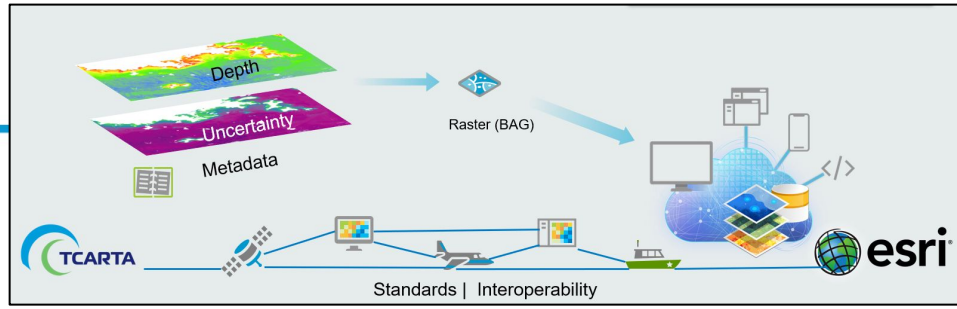
Un producto totalmente personalizable, producto basado en datos

Diseñado no para reemplazar cartas náuticas, sino para proporcionar datos complementarios cruciales



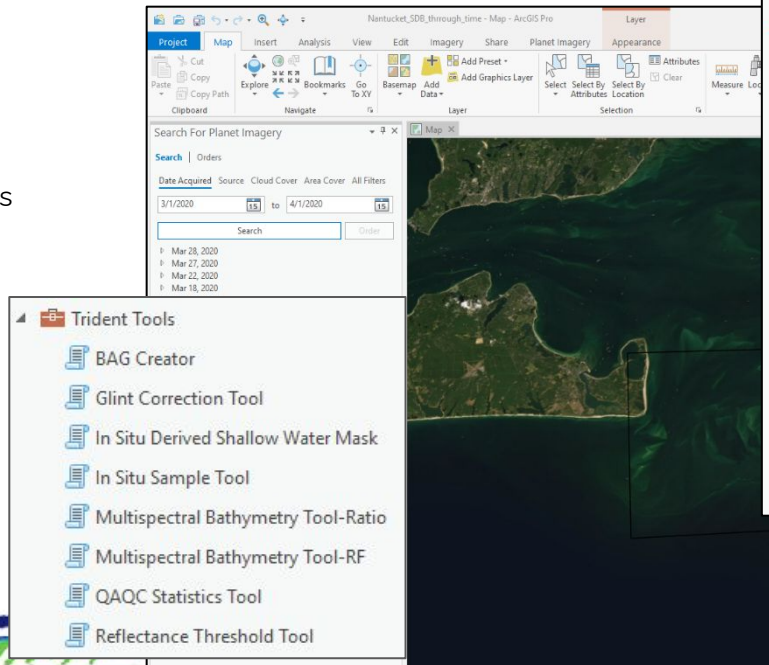
Software de Batimetría Derivada por Satélite

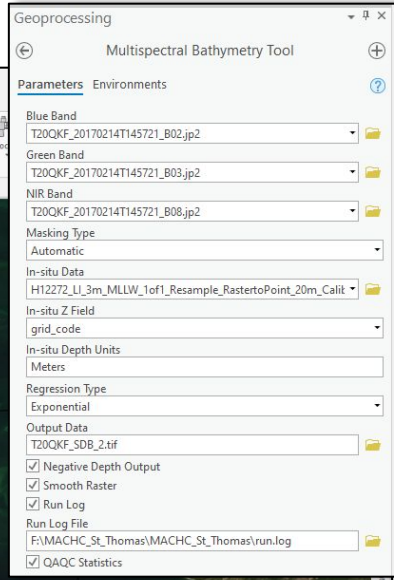
ArcGIS Pro Toolbox



- Herramientas prácticas para hidrógrafos, teledetección, SIG y personas con múltiples habilidades
- Herramientas interactivas, fáciles de aprender y comprender
- Simplificación de la producción, iteraciones fáciles
- Herramientas flexibles, desde preparación de imágenes hasta control de calidad.
- Integra datos existentes de levantamiento, imágenes aéreas y UAV

"Intuitivo, fácil de usar, el procesamiento es rápido y el software facilita la evaluación de los resultados"
Investigador en US Navy Research Laboratory



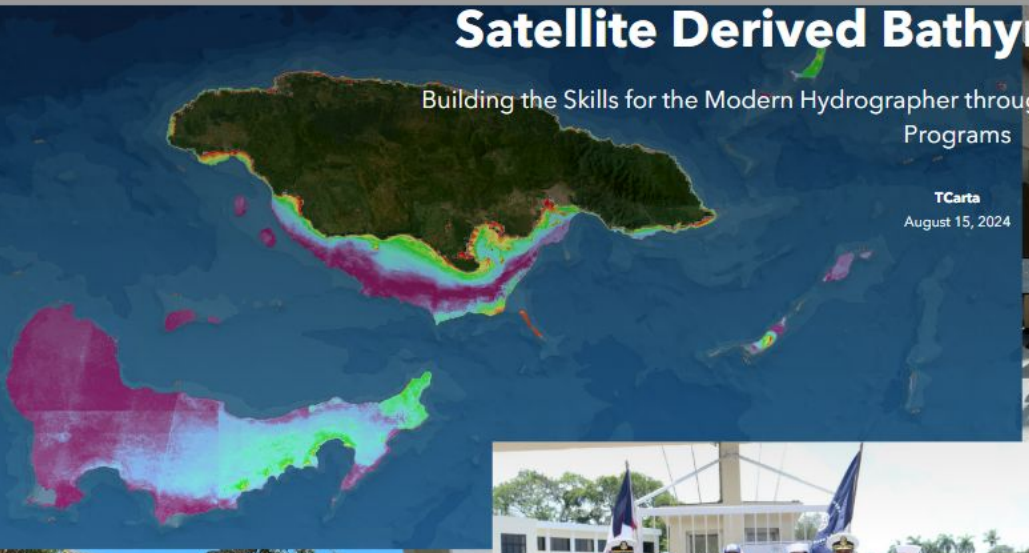


Satellite Derived Bathymetry Workshops

Building the Skills for the Modern Hydrographer through Collaborative Projects and Educational Programs

TCarta

August 15, 2024



NATIONAL LAND AGENCY

ARMADA DE REPÚBLICA DOMINICANA

MARINE INSTITUTE

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

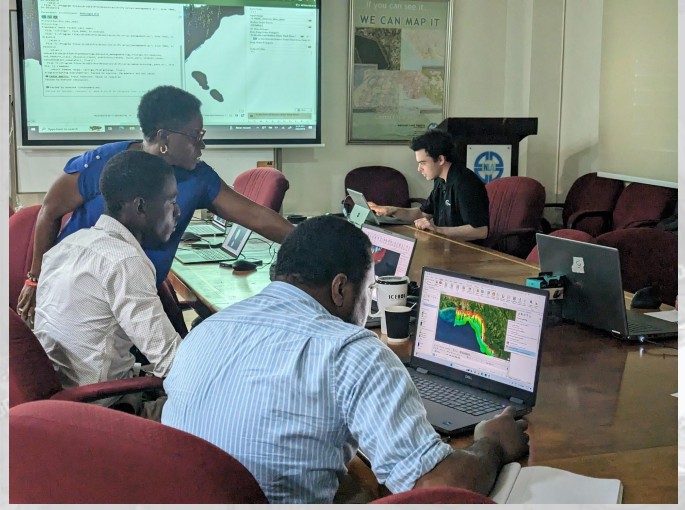
2024 Seabed 2030 Taller de SDB

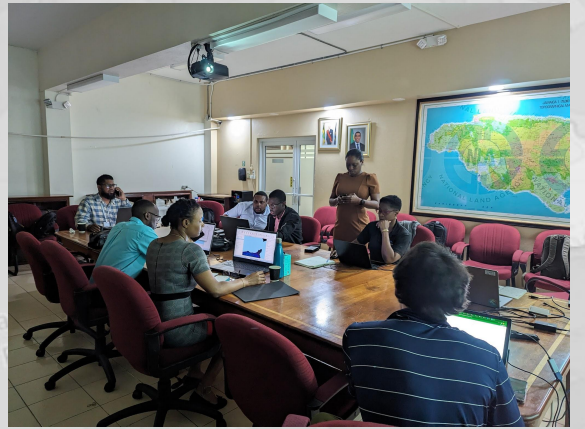
NATIONAL LAND AGENCY

- 5 NLA Personal
- 3 TCarta Personal
- 4.5 días
- “Si puedes verlo, podemos mapearlo”

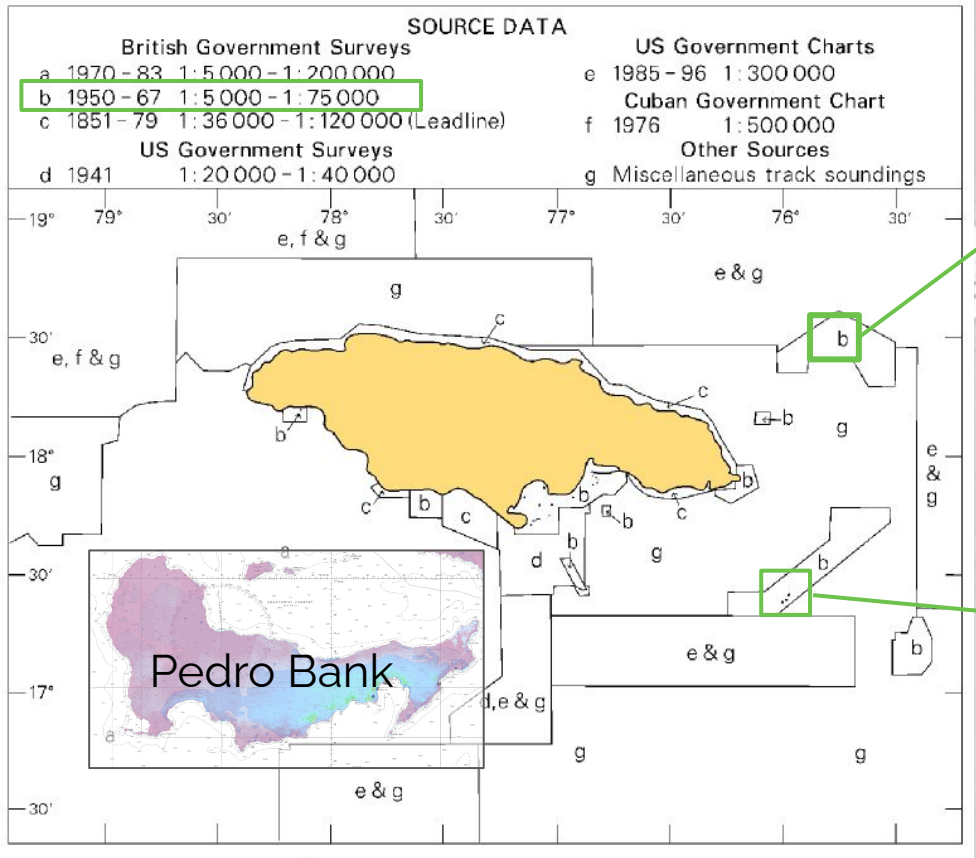
Aprendiendo y Adaptándonos sobre la Marcha

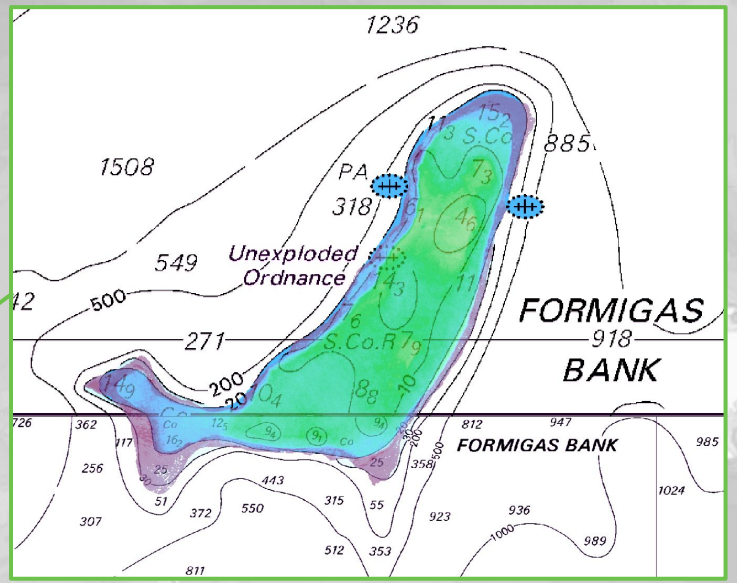
- Conceptos Básicos de SDB
- Selección de Imágenes
- Procesamiento de SDB
- Limpieza de datos Batimétricos
- Informes de control de calidad y precisión
- Aplicaciones del SDB en la Hidrografía
- Integración de datos de múltiples fuentes

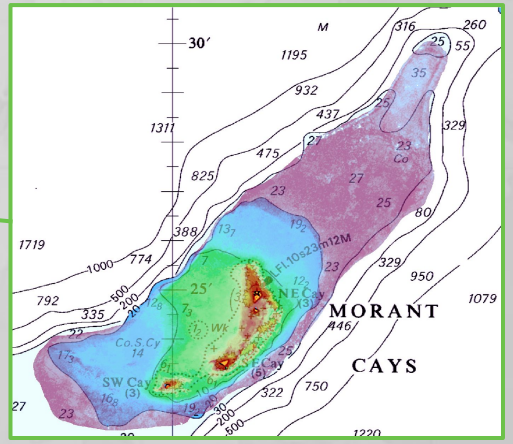




Proporcionando un levantamiento moderno de áreas remotas



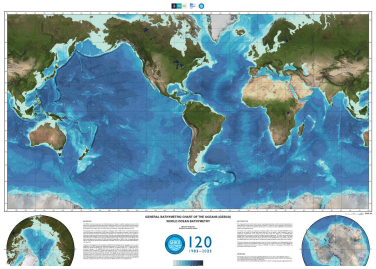




Camino para que una Pequeña Nación Insular con un Equipo Hidrográfico en Desarrollo Contribuya a Seabed 2030

NATIONAL LAND AGENCY

THE NIPPON FOUNDATION-GEBCO SEABED 2030



Cobertura: 13,539 km²
Profundidad Máxima: 36.03 m
Profundidad Mínima: -0.1 m

"Hecho en Jamaica, por Jamaiquinos, para Jamaica"

República Dominicana Julio 2024

ARMADA
DE REPÚBLICA DOMINICANA

TCARTA

Aprendizaje práctico

Materiales de instrucción & capacitación en Español

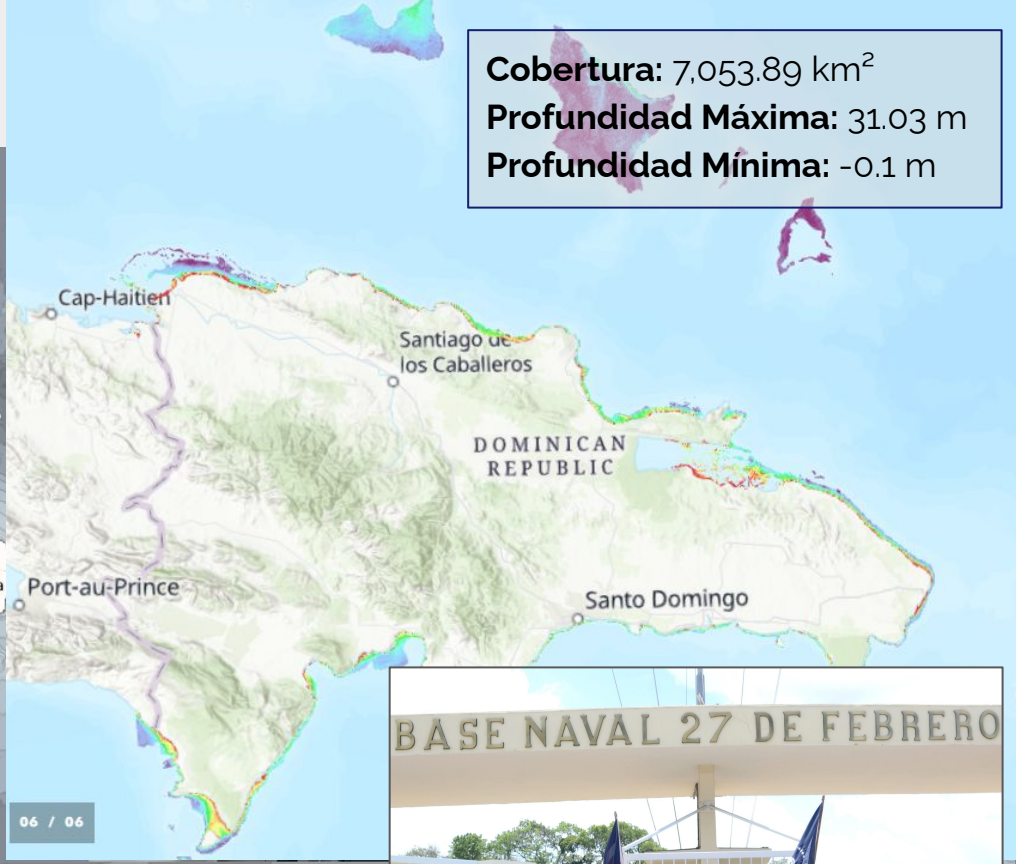
8 - Días de entrenamiento

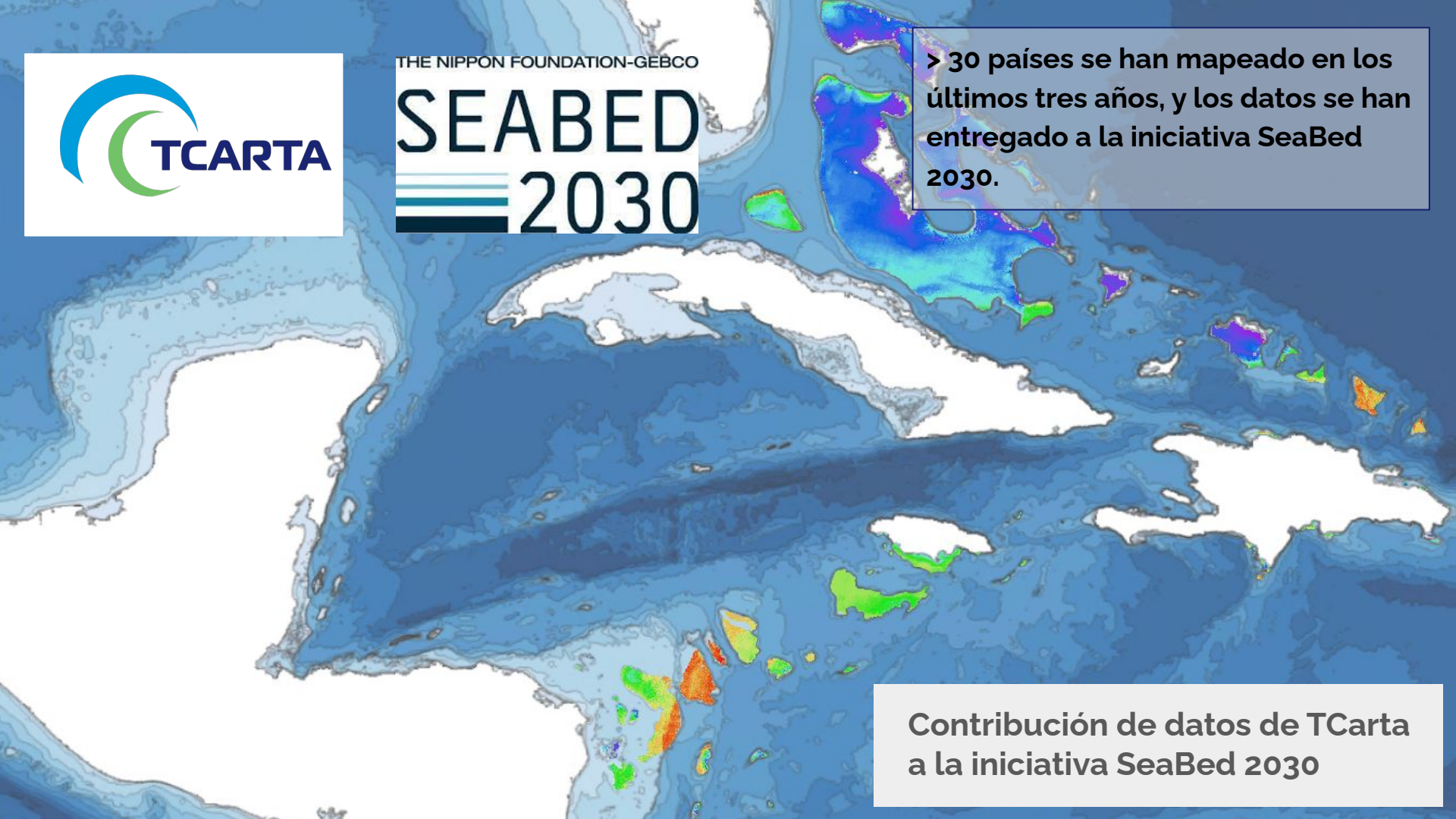
Incluyendo seguimiento de sargazo

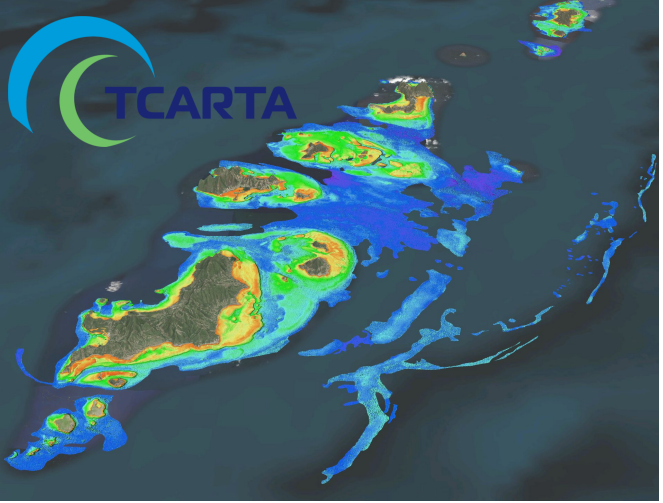
TCARTA

Camino hacia la Participación y la Contribución

Cobertura: 7,053.89 km²
Profundidad Máxima: 31.03 m
Profundidad Mínima: -0.1 m



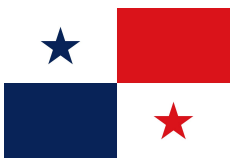

TCARTA
THE NIPPON FOUNDATION-GEBCO
SEABED
2030
> 30 países se han mapeado en los últimos tres años, y los datos se han entregado a la iniciativa SeaBed 2030.
Contribución de datos de TCarta a la iniciativa SeaBed 2030



¿Preguntas?

Link StoryMap sobre los talleres de SDB

https://arcg.is/1KvH5G3



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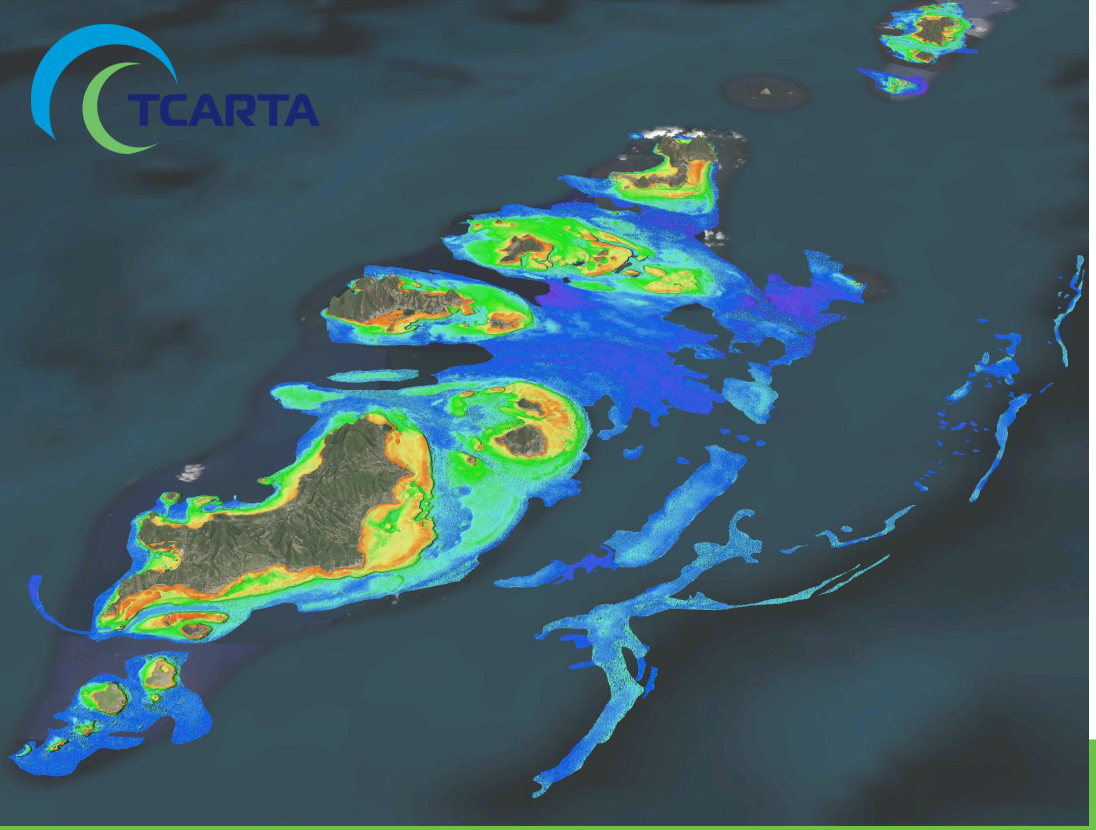
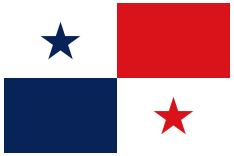
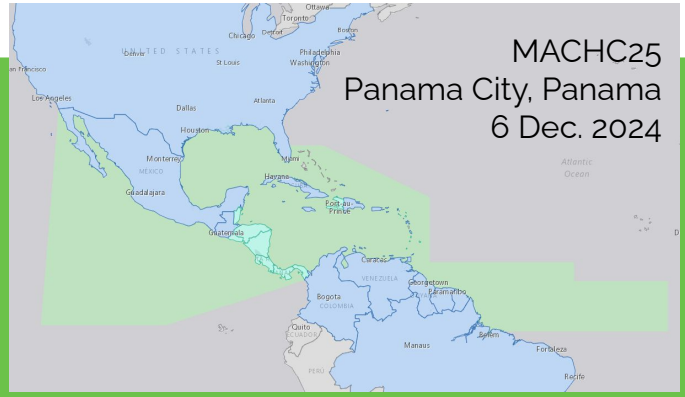
david@tcarta.com

ENGLISH VERSION



Satellite Based Mapping Applications and Hydrospatial Skill Building in the Caribbean Region



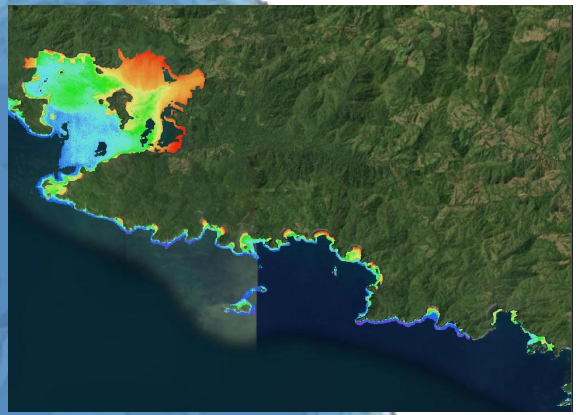


Kyle Goodrich
Founder
kyle@tcarta.com

David Bautista
Hydrospatial Project Manager
david@tcarta.com

Agenda

1. **Baseline Marine Spatial Layers**
   National Spatial Data in Jamaica
2. **Sargassum Tracking Dashboard** - Tourism Enhancement Fund (TEF), Jamaica
3. **Satellite Reconnaissance Charts**
4. **Satellite Derived Bathymetry Toolbox**
5. **Seabed 2030 Workshops & SDB Skill Building**



Marine Base Layers for Country-wide geospatial platform

Jamaica Marine Spatial Data Layers

- Thematic Marine Basemap
- Cloud-Free Satellite Imagery
- Coastal Bathymetry
- 90m Digital Bathymetry Model

For general use and public viewing

Jamaica Marine Basemap

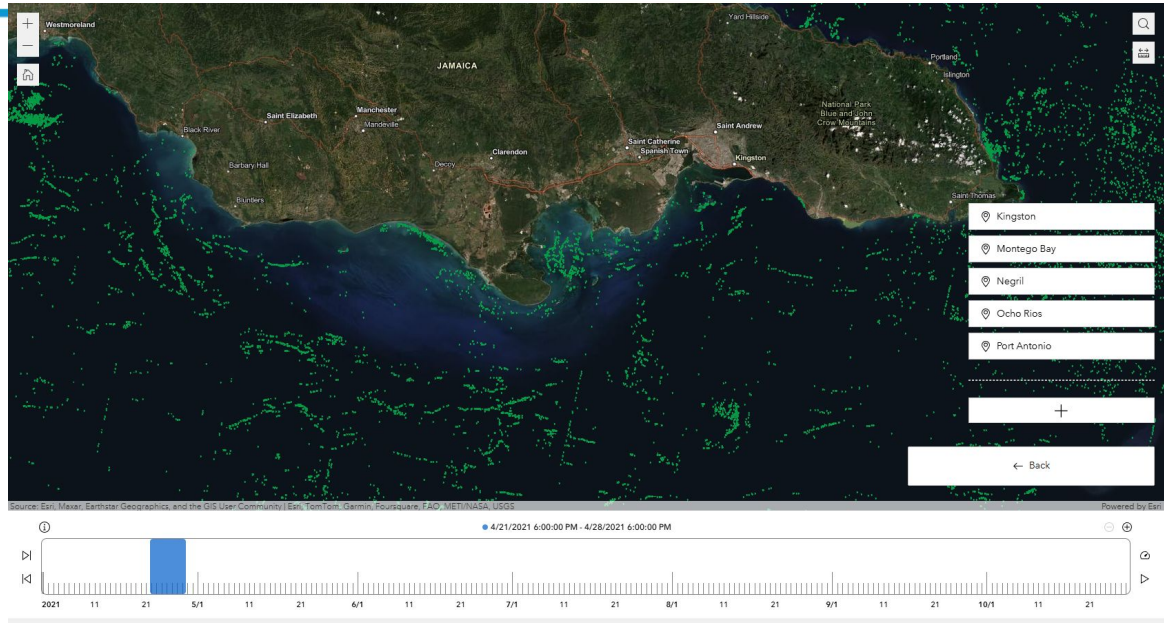
Sargassum Tracking Web App

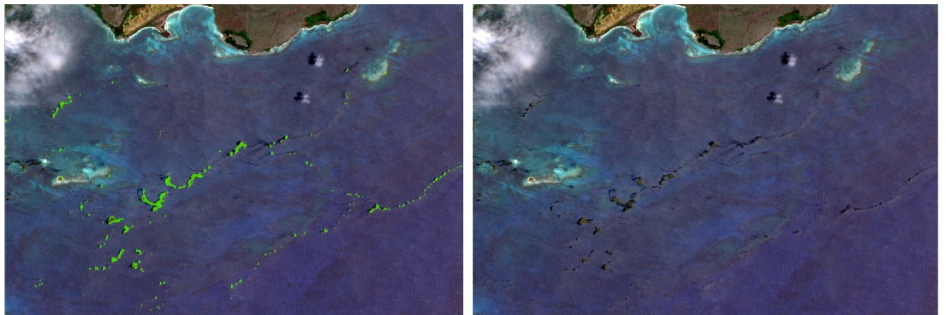
Jamaica Marine Spatial Data Layers

- Phase 1: Open Source Imagery
- Dashboard with Historical Images
- Visualization of Sargassum Mats

Tourism Enhancement Fund
Tourism dollars working for you.

For general use and public viewing





Satellite Reconnaissance Chart

Bathymetric surface

Formatted to client's needs. 5m horizontal and 10% depth +/- 0.5m vertical accuracy

Seafloor Classification

To assess site suitability for fishing, anchoring, or surveying methods

Features

Navigational aids and other chart features dependent on availability

Contours

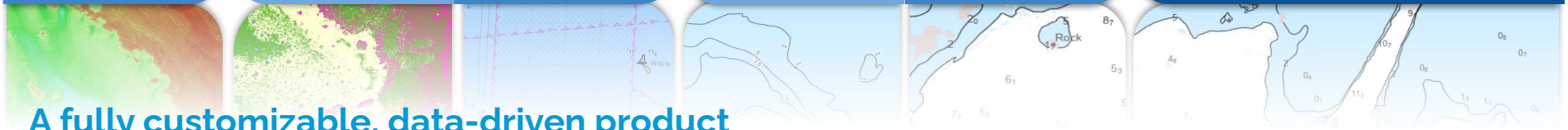
Derived from bathy surface, can be made up to 1m interval

Soundings

Derived from bathy surface. Density adjusted per chart scale.

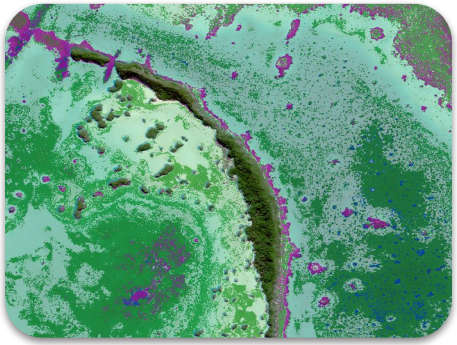
Satellite Reconnaissance Chart

- Cloud-hosted web map
- GIS-ready in geoTIFF and vector formats
- S-100, S-57
- PDF



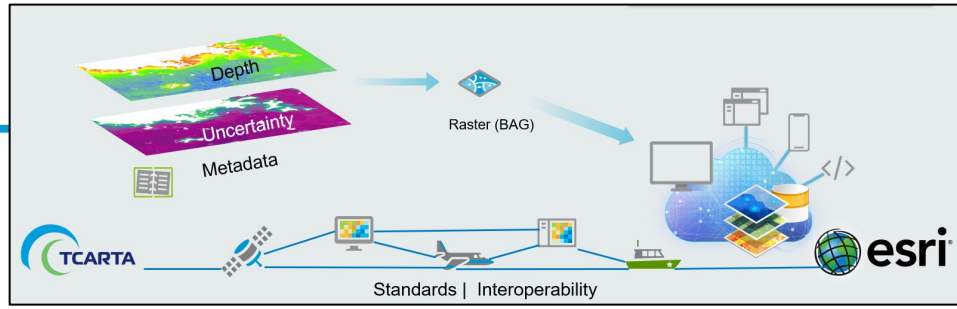
A fully customizable, data-driven product

Designed not to replace nautical charts, but to provide crucial supplemental data



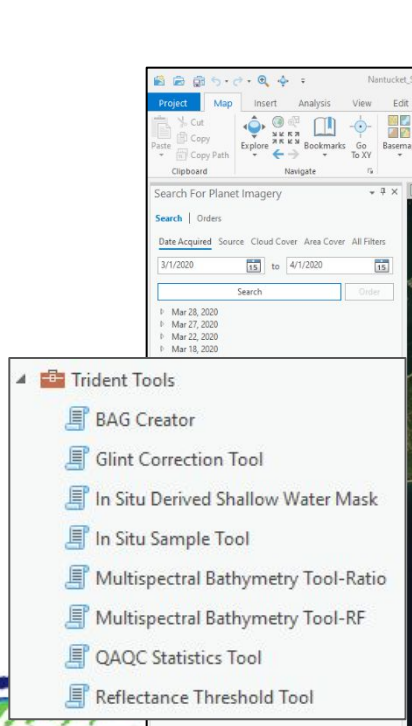
Satellite Derived Bathymetry Software

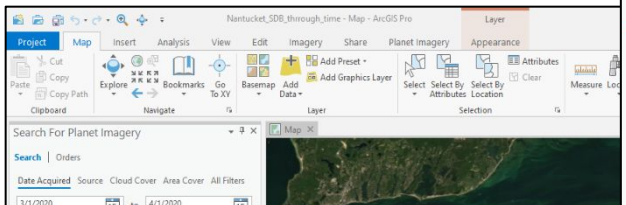
ArcGIS Pro Toolbox

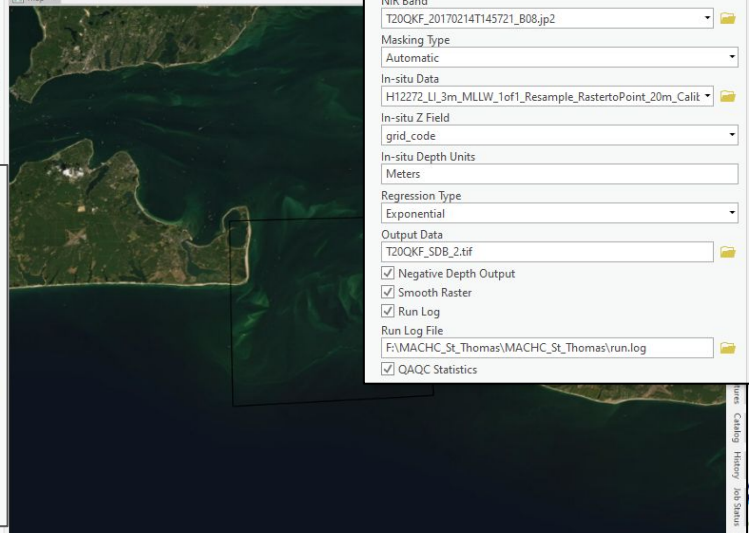


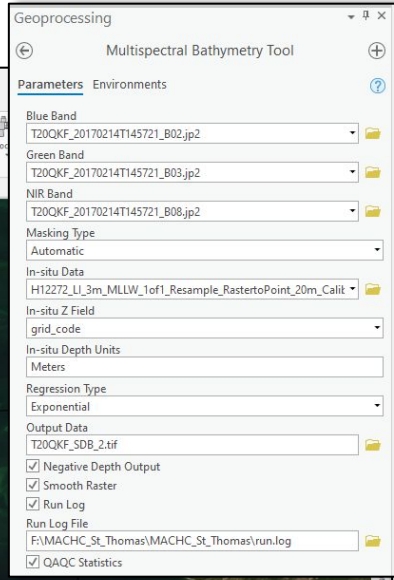
- Hands on tools for Hydrographers, remote sensing, GIS and multi-skilled individuals
- Interactive, easy-to-learn and understand tools
- Production simplification, Easy iterations
- Flexible tools, Image prep to QA.
- Integrate existing survey data, aerial & UAV imagery

"intuitive, easy to use, the processing is fast, and the software makes it easy to assess the outputs"
Researcher at US Navy Research Laboratory







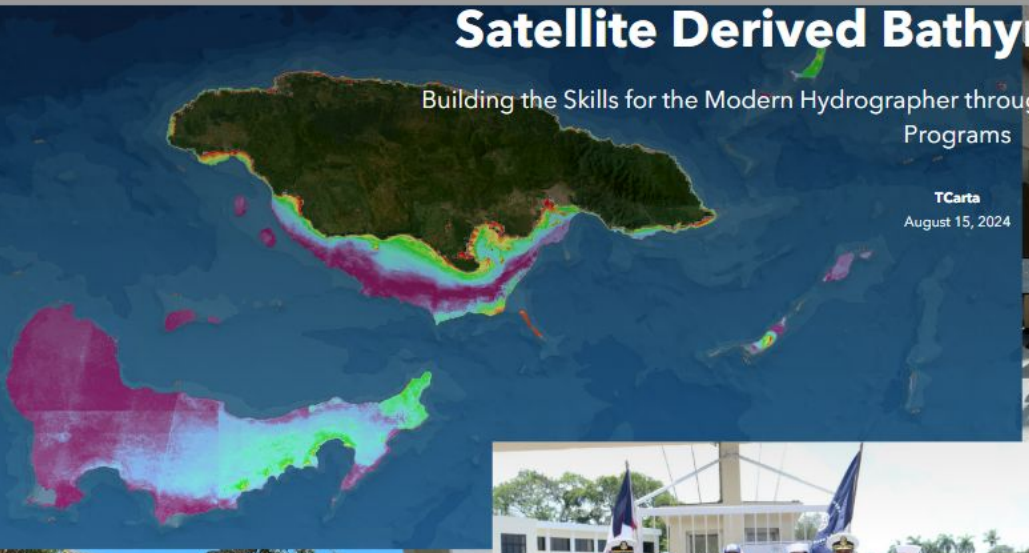


Satellite Derived Bathymetry Workshops

Building the Skills for the Modern Hydrographer through Collaborative Projects and Educational Programs

TCarta

August 15, 2024



NATIONAL LAND AGENCY

ARMADA DE REPÚBLICA DOMINICANA

MARINE INSTITUTE

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

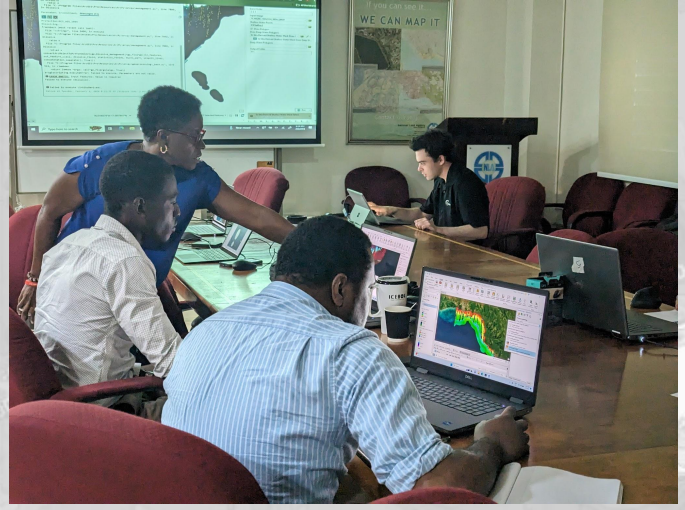
2024 Seabed 2030 SDB Workshop

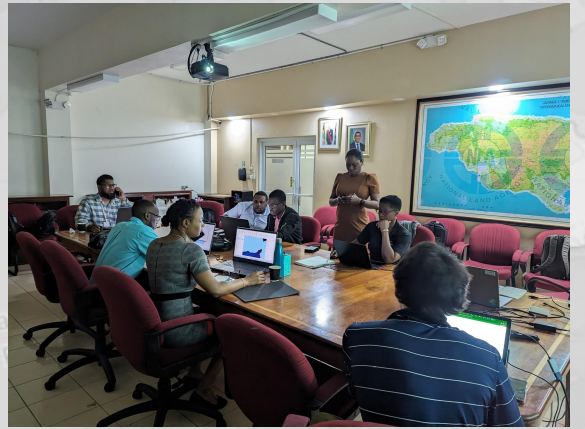
NATIONAL LAND AGENCY

- 5 NLA Staff
- 3 TCarta Staff
- 4.5 days
- “If you can see it, we can map it”

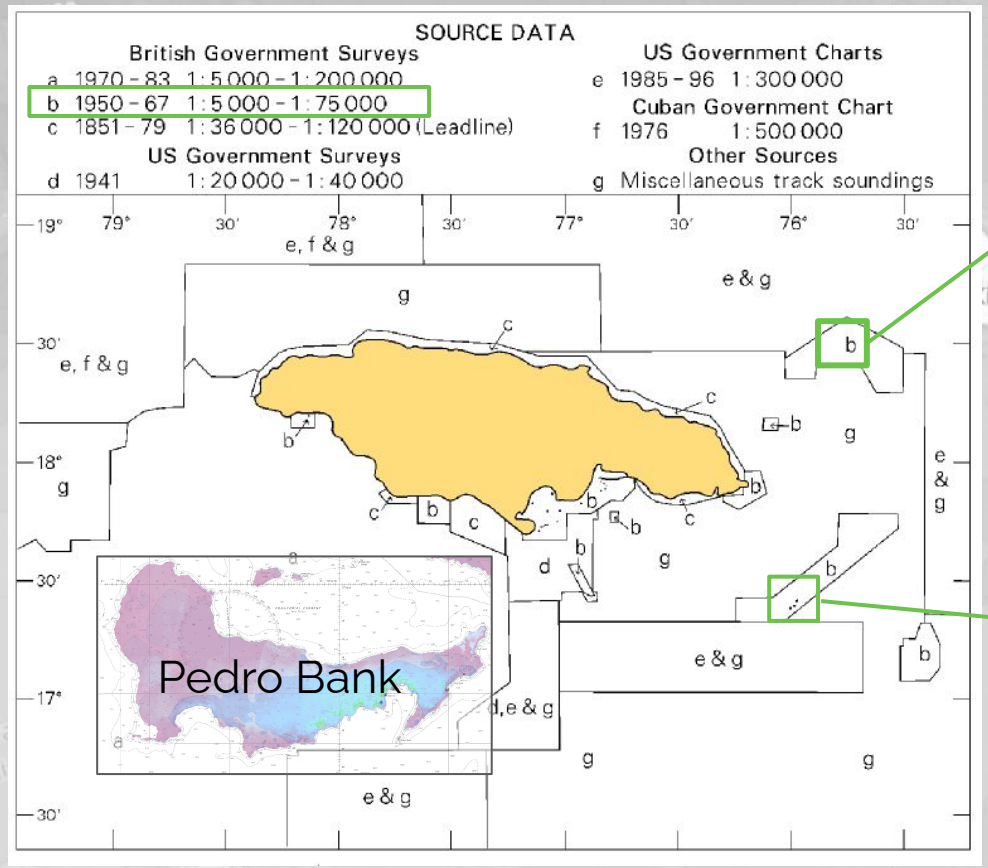
Learning and adapting while underway

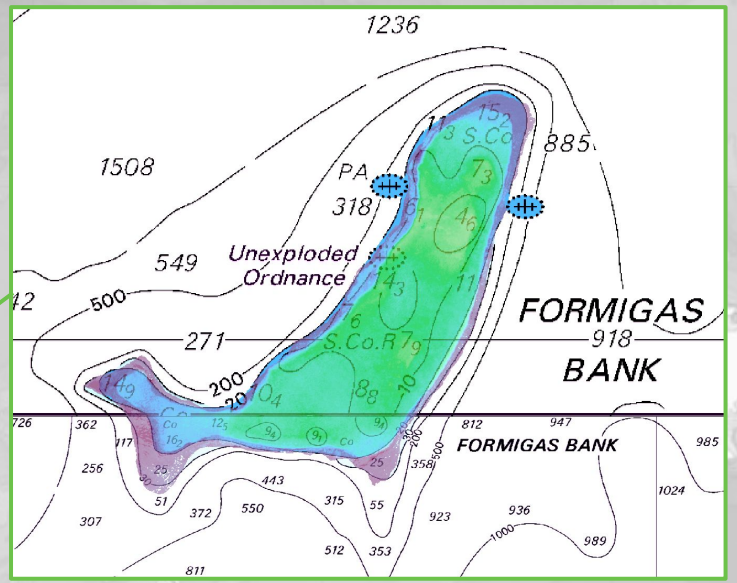
- Basics of SDB
- Imagery Selection
- SDB processing
- Bathymetry data cleaning
- QA and accuracy reporting
- Applications of SDB within hydrography
- Multi-source data integration

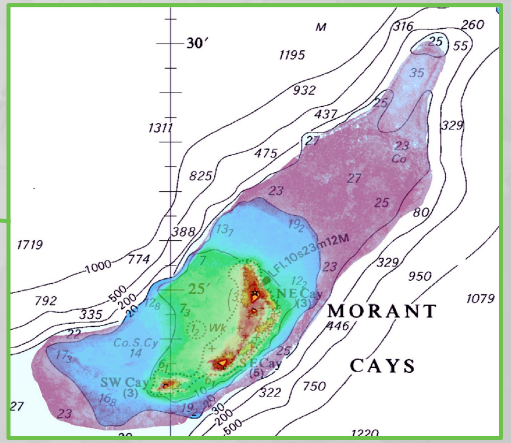




Providing modern survey of remote areas



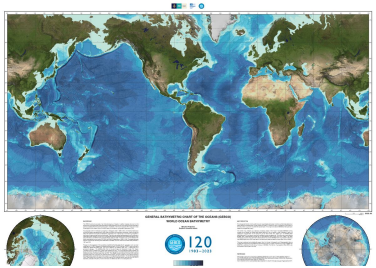




Pathway for Small Island Nation with a Developing Hydrographic Team to Contribution to Seabed 2030

NATIONAL LAND AGENCY

THE NIPPON FOUNDATION-GEBCO SEABED 2030



Coverage: 13,539 km²
Maximum Depth: 36.03 m
Minimum Depth: -0.1 m

"Made in Jamaica, by Jamaicans, for Jamaica"

Dominican Republic July 2024

ARMADA
DE REPÚBLICA DOMINICANA

TCARTA

Hands-on learning

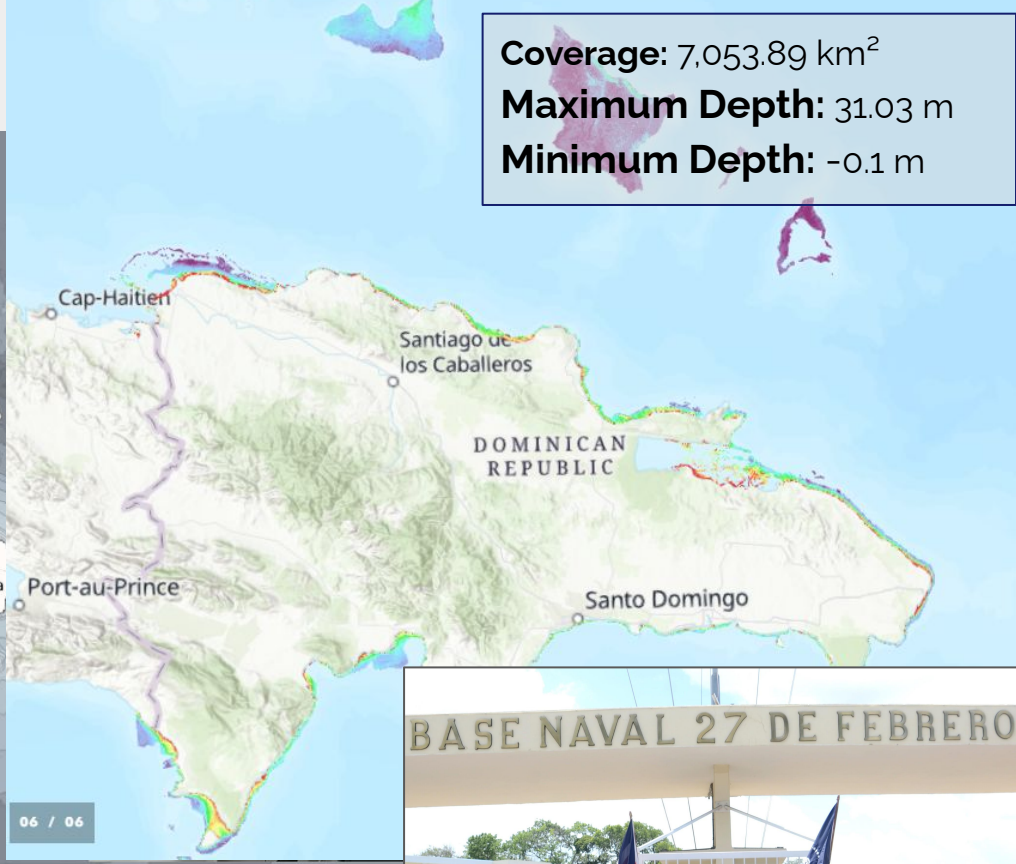
Instruction & training materials in Spanish

8 - days of training

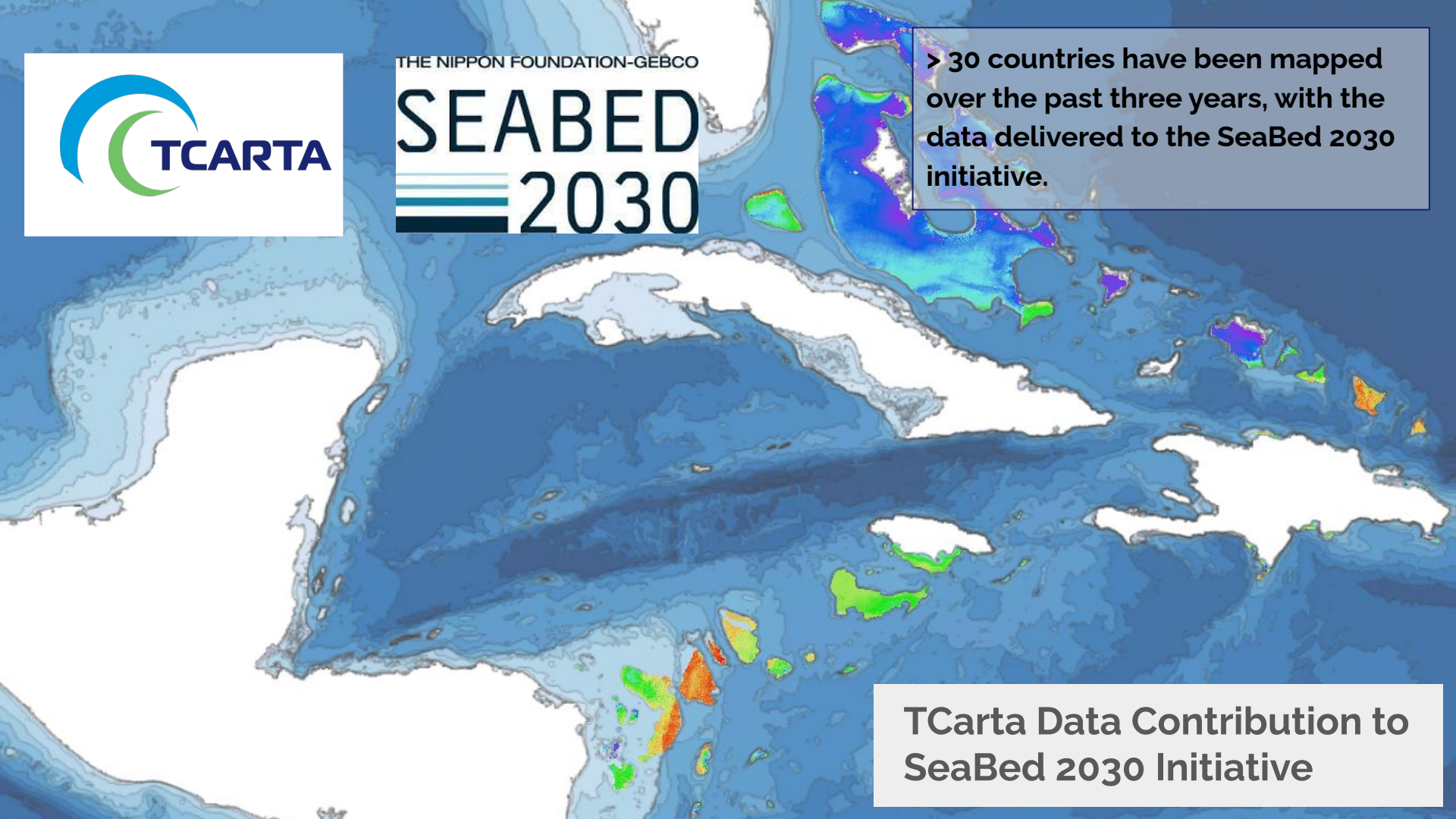
Included sargassum tracking

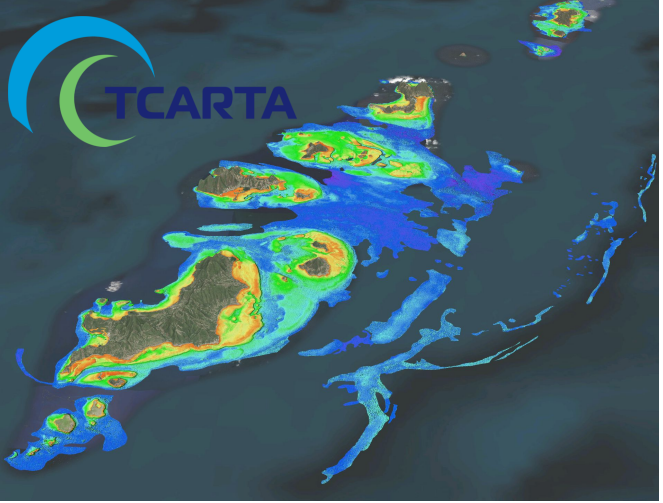
TCARTA

Pathway to Participation and Contribution



Coverage: 7,053.89 km²
Maximum Depth: 31.03 m
Minimum Depth: -0.1 m

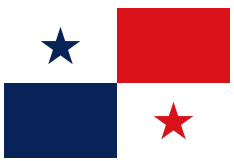

TCARTA
THE NIPPON FOUNDATION-GEBCO
SEABED
2030
> 30 countries have been mapped over the past three years, with the data delivered to the SeaBed 2030 initiative.
TCarta Data Contribution to SeaBed 2030 Initiative

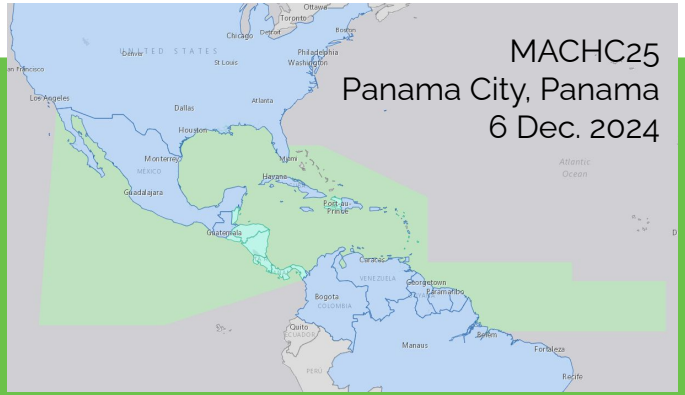


Questions?

Link to StoryMap on SDB Workshops

https://arcg.is/1KvH5G3





Kyle Goodrich
Founder
kyle@tcarta.com

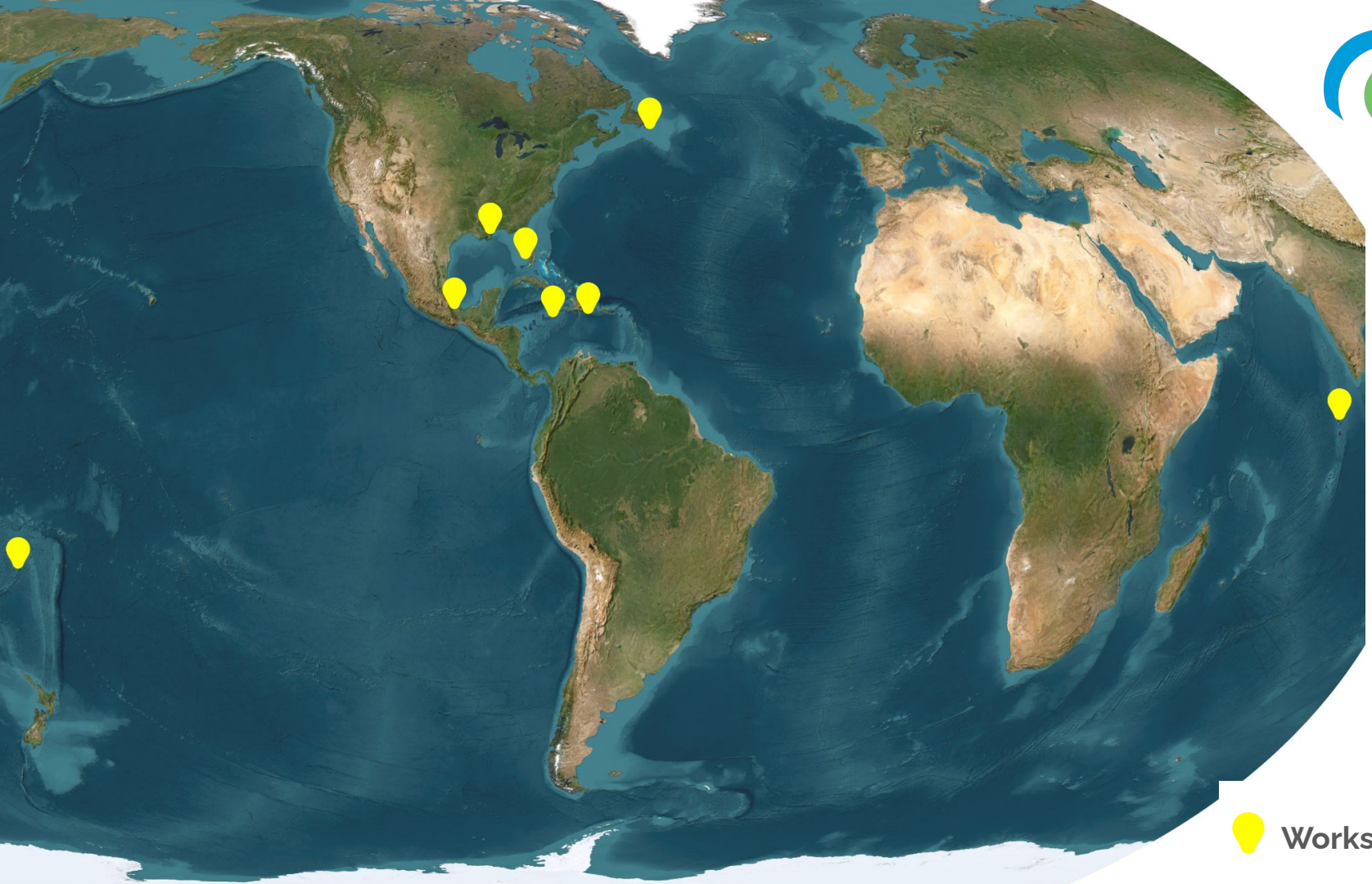
David Bautista
Hydrospatial Project Manager
david@tcarta.com

Satellite Based Mapping Applications and Hydrospatial Skill Building in the Caribbean Region

Meso American and Caribbean Hydrographic Commission

Kyle Goodrich
Founder
kyle@tcarta.com

David Bautista
Hydrospatial Project Manager
david@tcarta.com

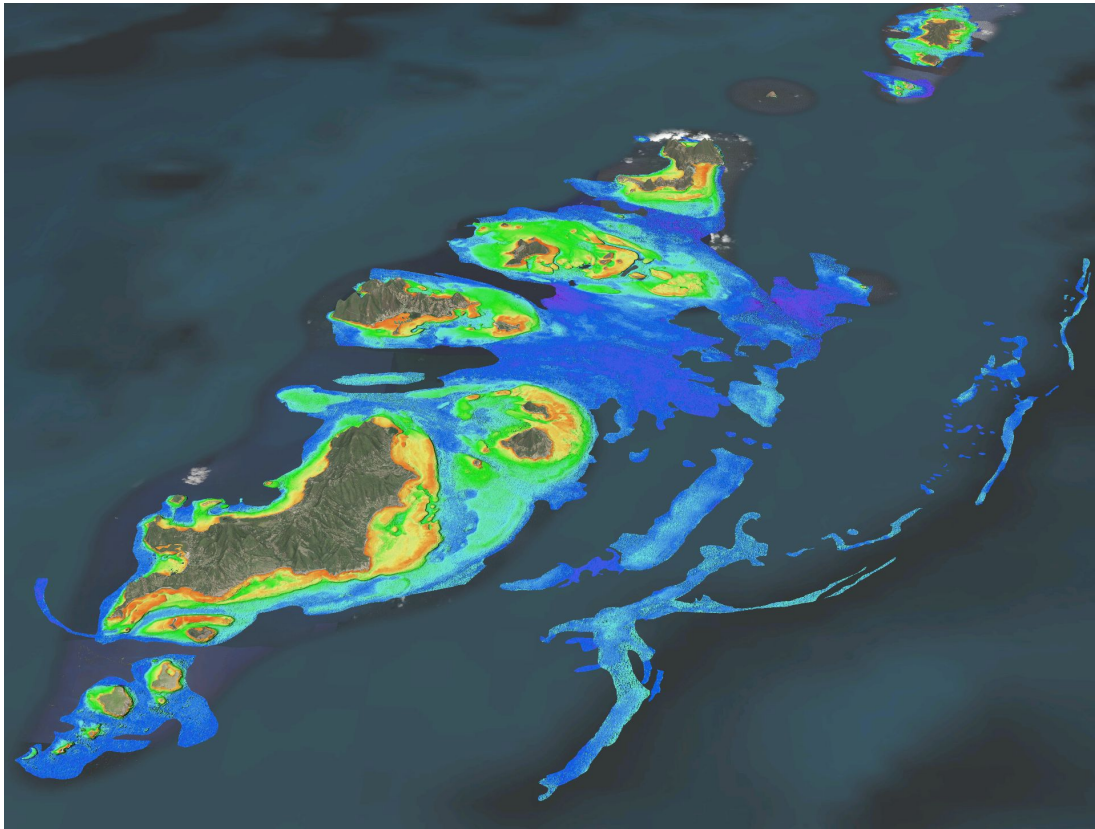


TCARTA

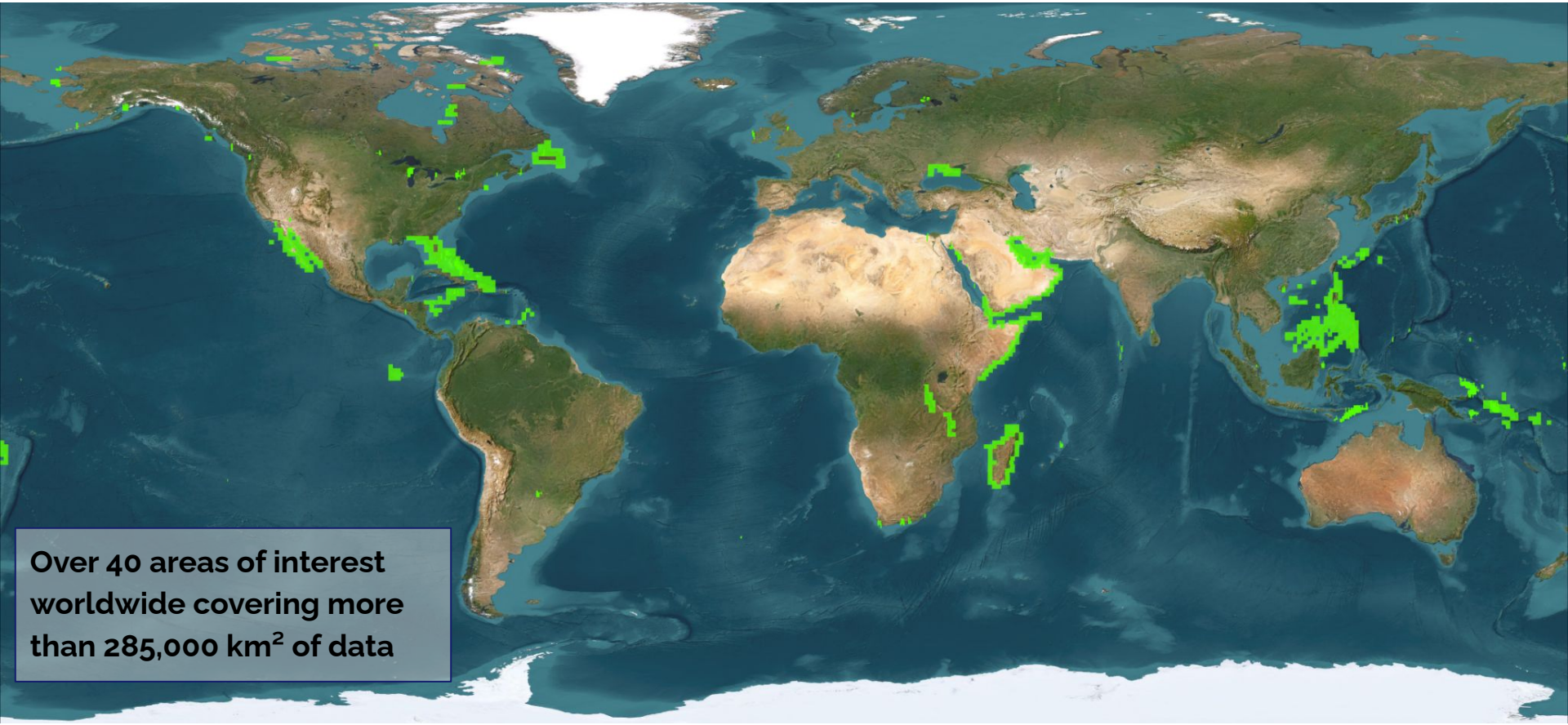
Workshops

TOPICS

1. **Baseline Marine Spatial Layers** for general use - Example in Jamaica
2. **Sargassum Tracking Dashboard** - Tourism Enhancement Fund (TEF), Jamaica
3. **Satellite Reconnaissance Charts**
4. **Satellite Derived Bathymetry Toolbox**
5. **Seabed 2030 Workshop & SDB Skill Building**



Production of Multiple Datasets (2022 - 2024)



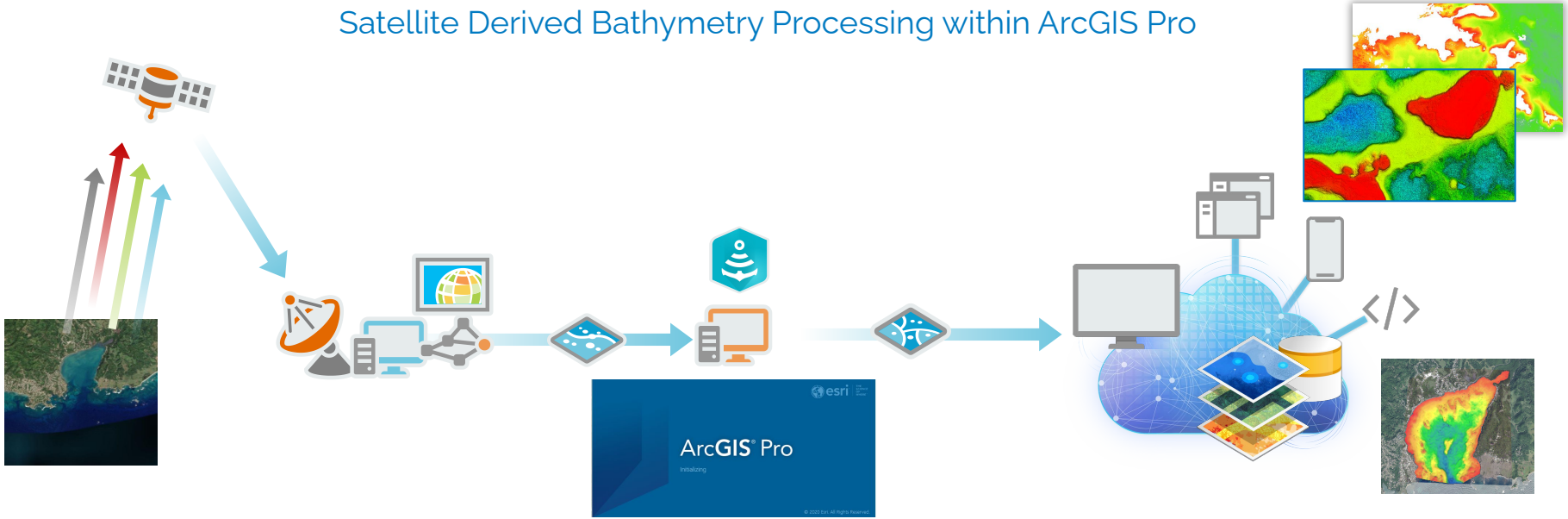

MANEUVERING BOARD
SEABED 2030


SANTO DOMINGO
MIEMBROS DE LA ARMADA RECIBEN ENTRENAMIENTO
SIN

TCARTA

Trident Tools - SDB SaaS

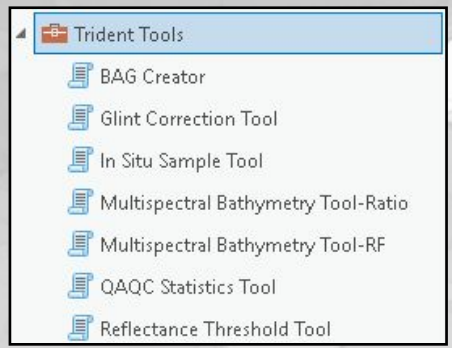
Satellite Derived Bathymetry Processing within ArcGIS Pro




bathymetry from imagery

Trident Tools: ArcPro SDB Software

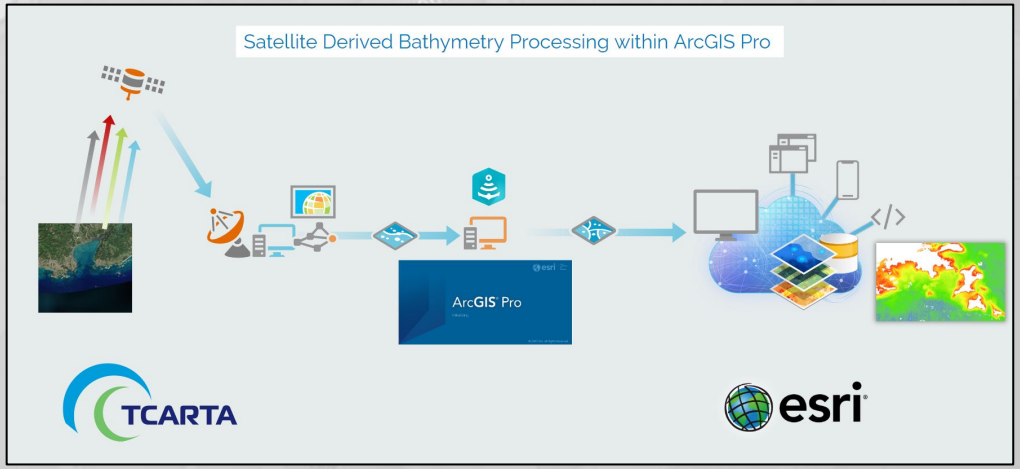
Within Trident Tools Geoprocessing Toolbox:



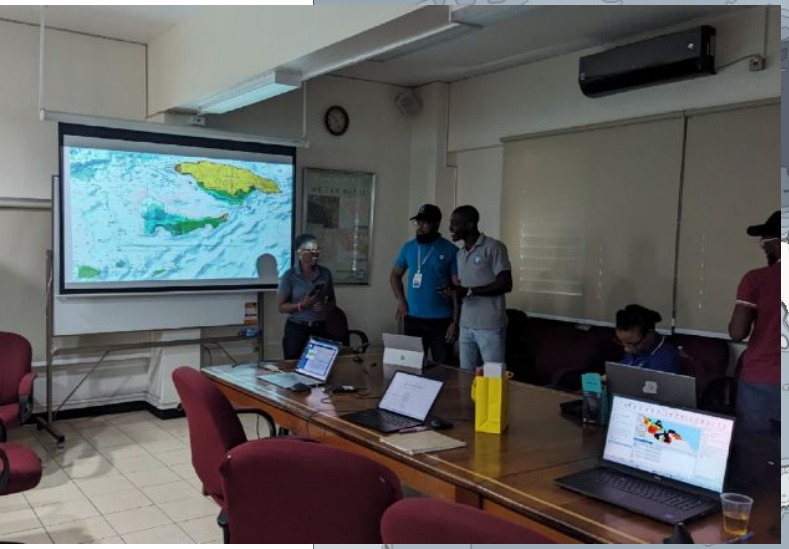
Toolbox Capabilities:

- Hands on tools for Hydrographers, remote sensing, GIS and multi-skilled individuals
- Interactive, easy-to-learn and understand tools
- Production simplification, Easy iterations
- Integrate existing survey data, in situ, ICESat-2
- Flexible, adaptable tools/content based on agency needs

TCarta's Trident Tools providers users the ability to produces SDB within the Esri ArcGIS Pro software environment from any multispectral satellite imagery, aerial imagery or UAV collected images. The multi-function tool enables satellite imagery and in situ data preparation, water depth derivation and data accuracy assessment tools and provides a complete set of tools to turn imagery into bathymetry.



FEBRUARY 2024

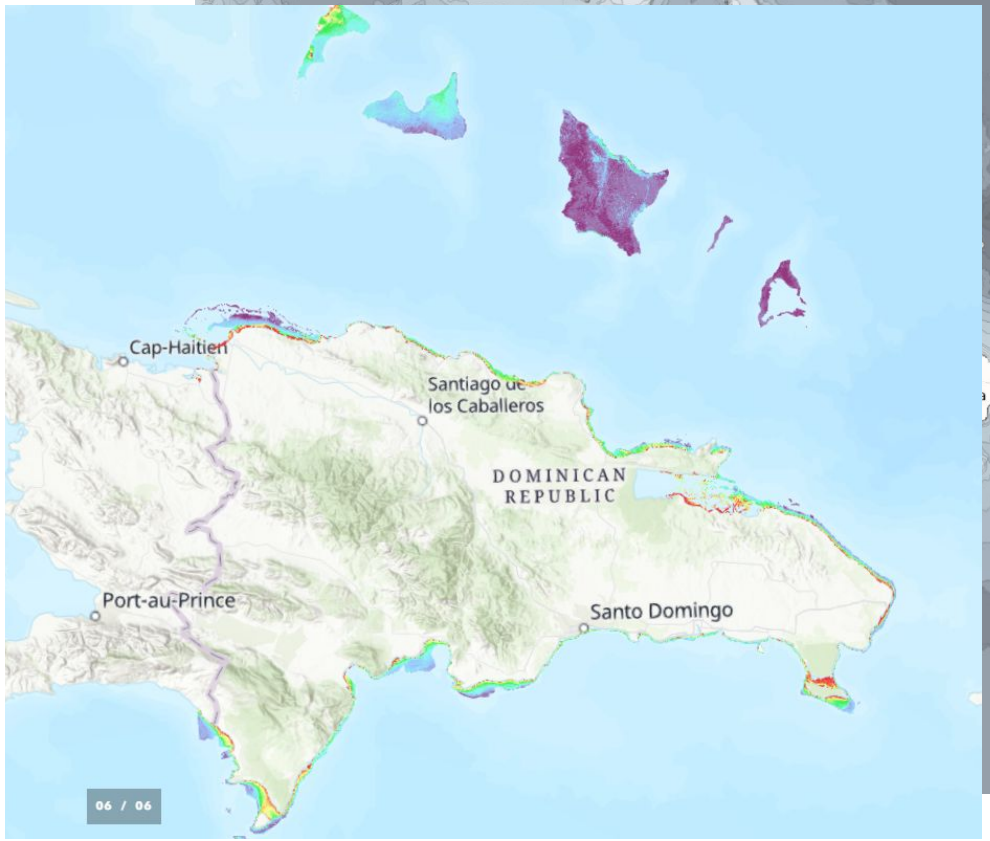


Thank you.

Please contact me for information on SDB Workshops for Seabed 2030

Kyle Goodrich
kyle@tcarta.com
www.tcarta.com

Workshop Story Map Link:
https://arcg.is/1KvH5G3


Cap-Haitien
Santiago de
los Caballeros
DOMINICAN
REPUBLIC
Port-au-Prince
Santo Domingo
06 / 06

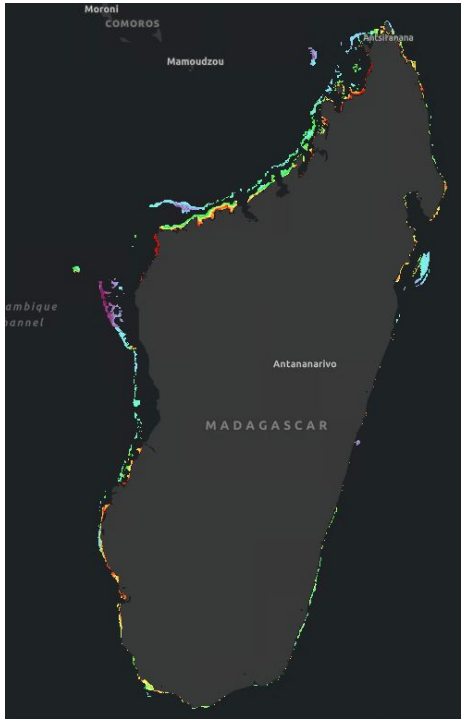

THE NIPPON FOUNDATION-GEBCO
SEABED
2030

TCARTA

Summer 2023 & 2024

MEMORIAL UNIVERSITY

THE NIPPON FOUNDATION-GEBCO SEABED 2030

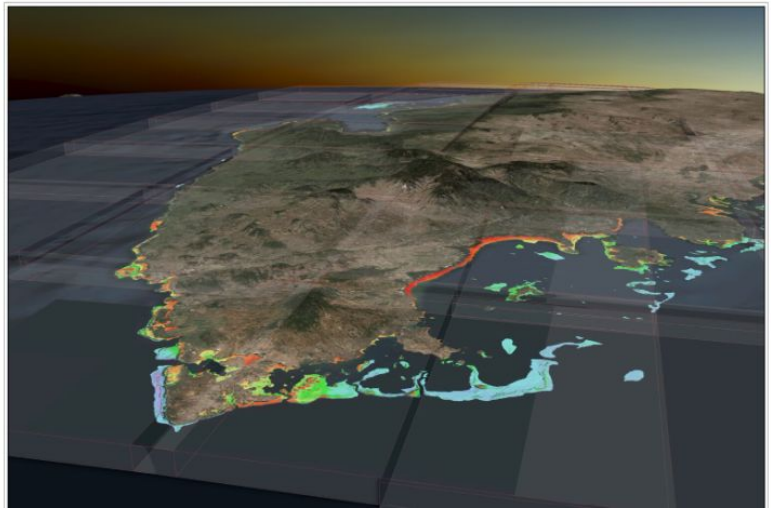


The American Surveyor

Internship Program Makes Major Data Contribution to Seabed 2030 Project

TCarta Marine // 11.02.2023

Denver, Colorado, 2 November 2023 – TCarta Marine, a global provider of hydrospatial products and services, has delivered three major satellite derived bathymetry (SDB) data sets to The Nippon Foundation-GEBCO Seabed 2030 project. Students in Canada participating in a 2023 summer internship program created the SDB products for the entire coastline of Madagascar, Newfoundland, and two Canadian Arctic research areas.



TCARTA

Our Team

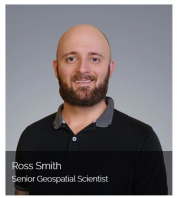
Kyle Goodrich

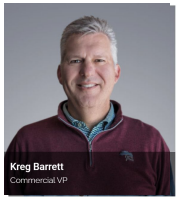
President

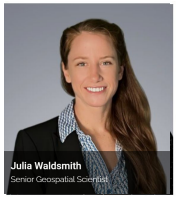
Corey Goodrich

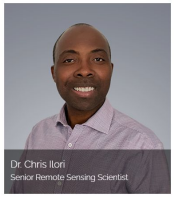
Managing Partner

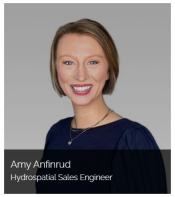
TEAM

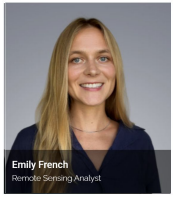


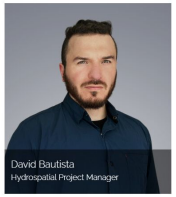


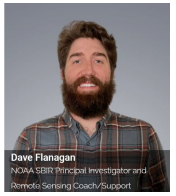


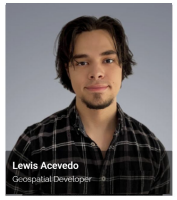


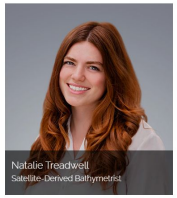


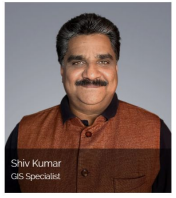


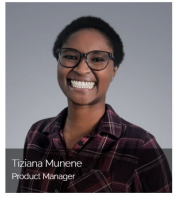


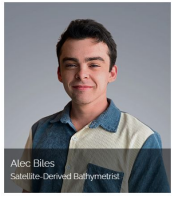


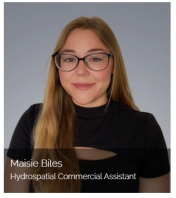


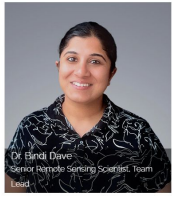




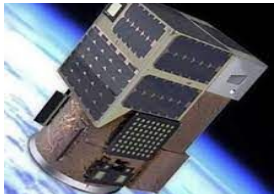




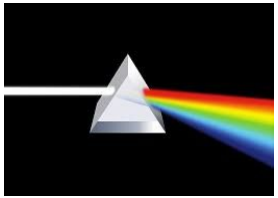




Remote Sensing



Physics



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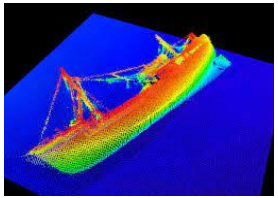


Geospatial Programming

Oceanography

Nautical Charting

TECHNOLOGY

TCARTA

Student-Produced Seabed 2030 Contributions

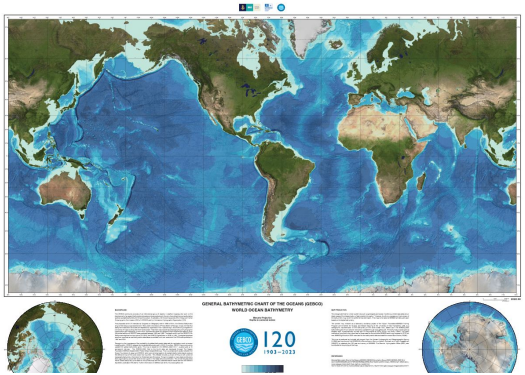
12-week summer work term - 2023 & 2024

- In-person instruction and virtual workrooms
- SDB supported university research & native villages
- SDB combined with Crowd Sourced Bathymetry

MARINE INSTITUTE

THE NIPPON FOUNDATION-GEBCO

SEABED 2030



LIDAR MAGAZINE

Marine Institute and TCarta Student Internship Program Makes Major Data Contribution to Seabed 2030 Project

TCARTA MARINE // 11.02.2023

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