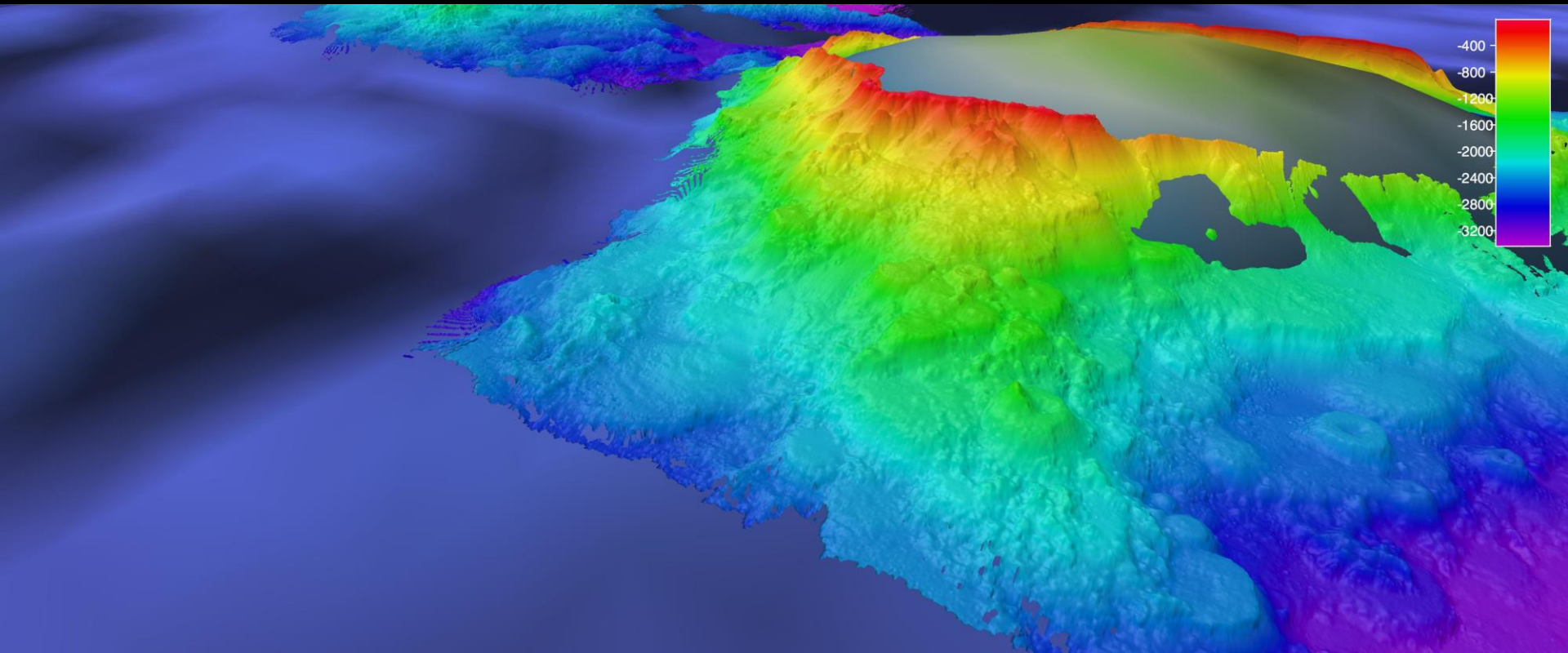


E/V Nautilus Mapping for Ocean Exploration

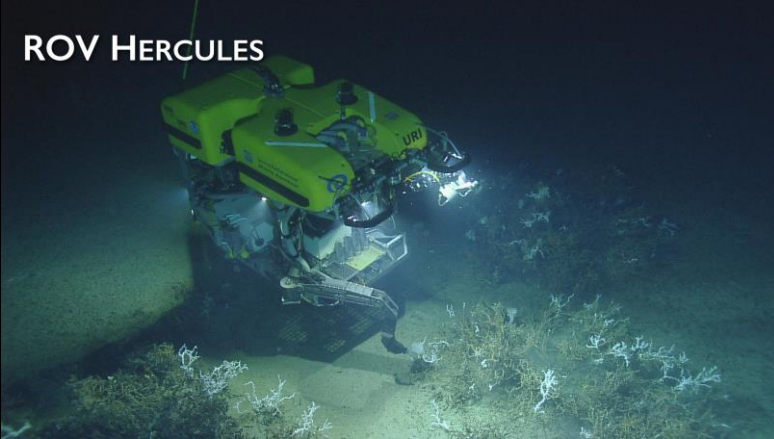


Dr. Nicole Raineault
Vice President of Exploration & Science Operations
Ocean Exploration Trust

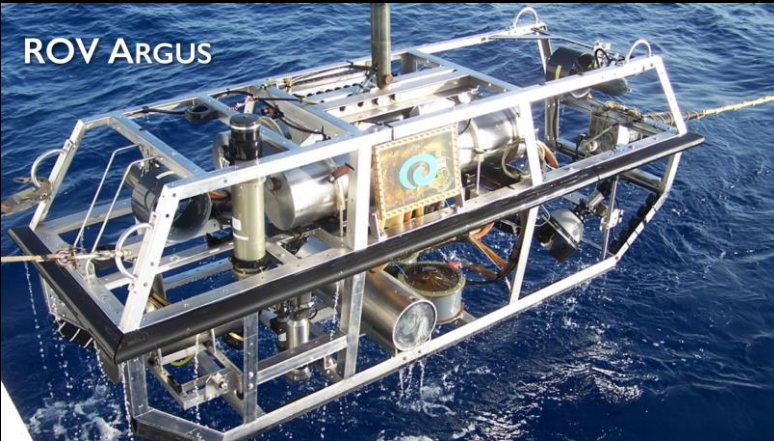
November 15, 2017
Map the Gaps

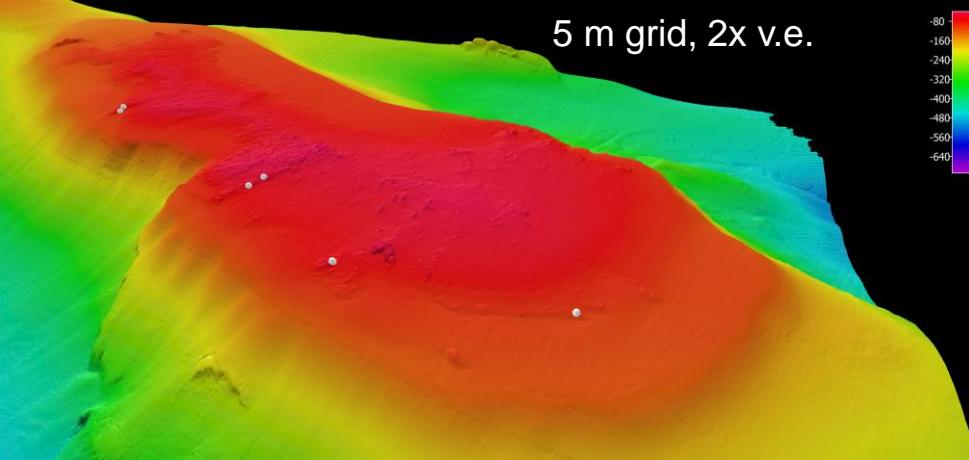
Nautilus Exploration Program

ROV HERCULES



ROV ARGUS

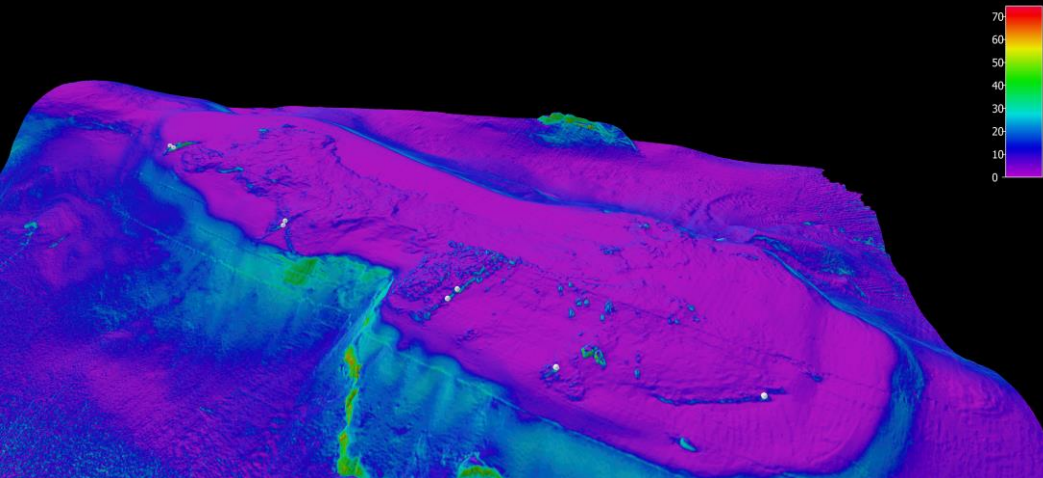
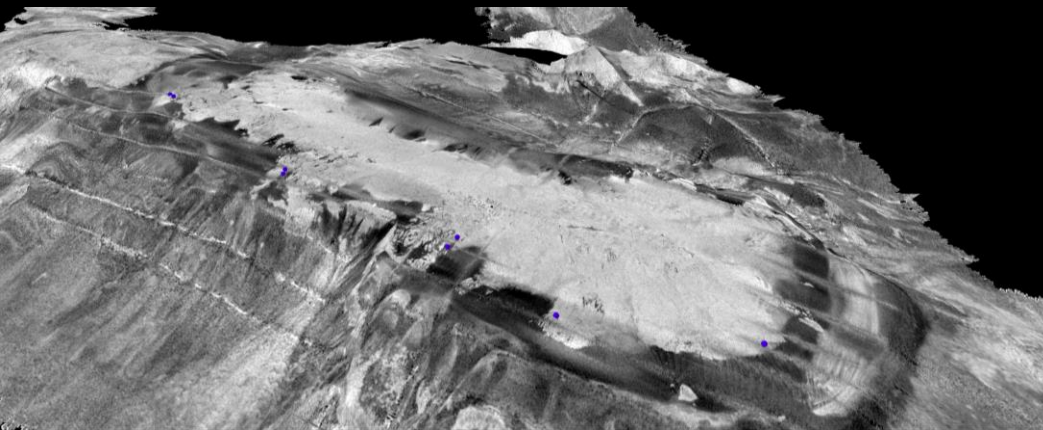




- Kongsberg EM302 multibeam echosounder (bathymetry, backscatter, water column)

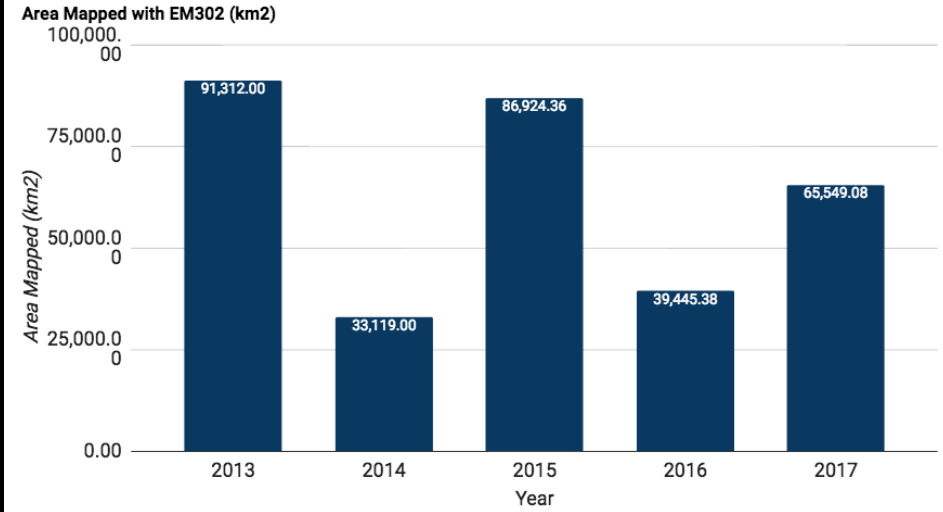
- Knudsen 3.5/15 kHz systems (Chirp sub-bottom, single beam)

- High resolution ROV-based M3 sonar, laser light mapping, and stereo-pair camera



System Capabilities:

- Mapping speed: 8-10 knots
- Coverage: 2.5-5.5x water depth
- Depth: 30-7000 m (60-70°)
- Resolution: ~1% water depth
- Operational modes:
 - Bathymetric mapping
 - Water column (seep) mapping



Mapping Products Per Survey:

- GSFs, geotiff images & floating point, SD file, KML, polygon, survey report, line file report, processing log
- Outreach products (handled by production for NL & social media)

Nautilus Live
November 10 at 9:00am · 🌐

Volcanic vents. Lava balloons. Manta rays. We're launching the first ROV exploration of the Revillagigedo Archipelago today at ~9:00am MST. Join the Nautilus team and researchers at URI Graduate School of Oceanography and UNAM Universidad Nacional Autónoma de México as we dive 570m into this recently-designated UNESCO World Heritage Site and biodiverse marine protected area. Our first dive spans 16 hours and takes us to the vent site of a 1993 submarine eruption that occurred offshore of Socorro Island. Explore with us and send in your questions to our explorers: NautilusLive.org

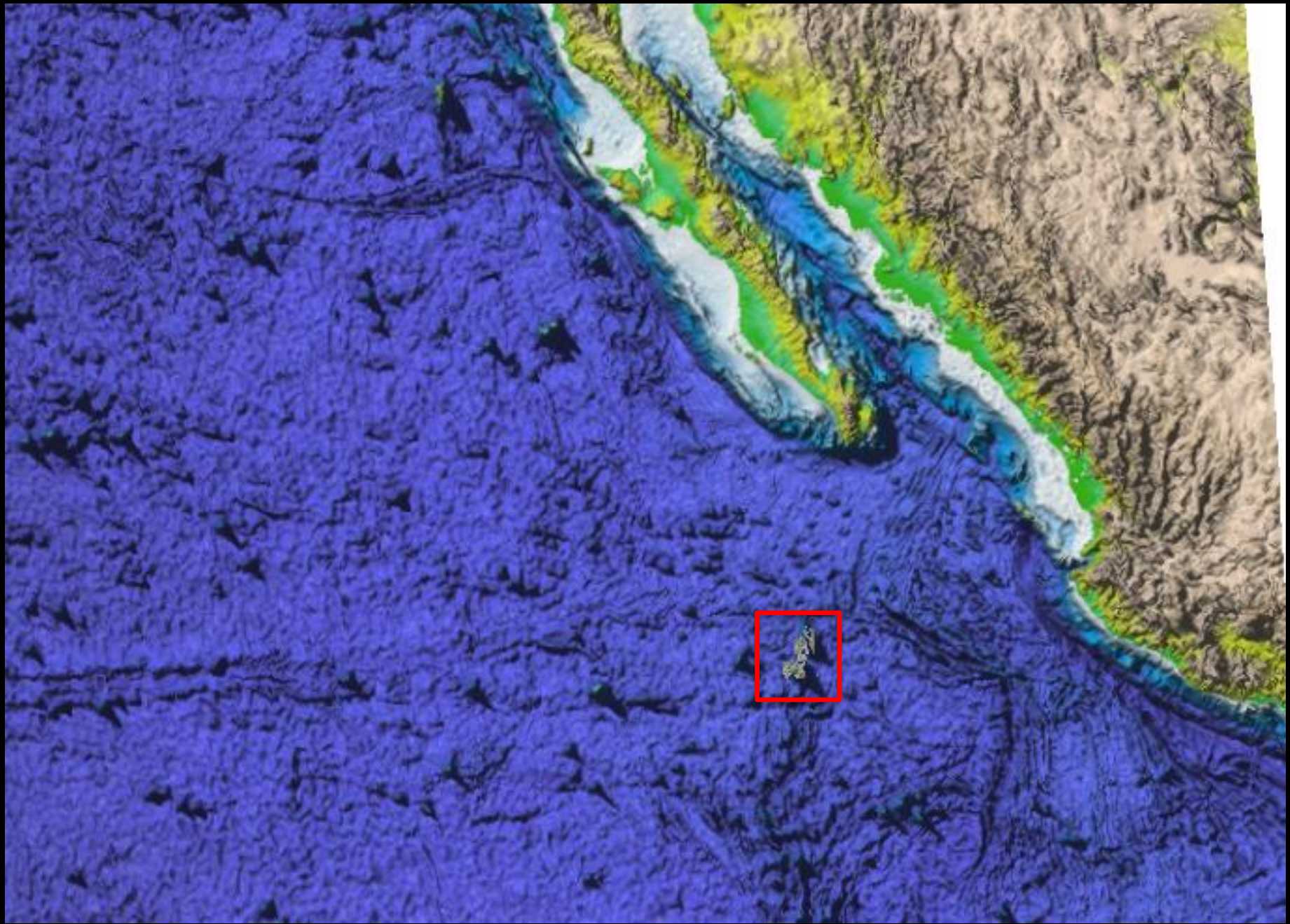
SOCORRO & SAN BENEDICTO

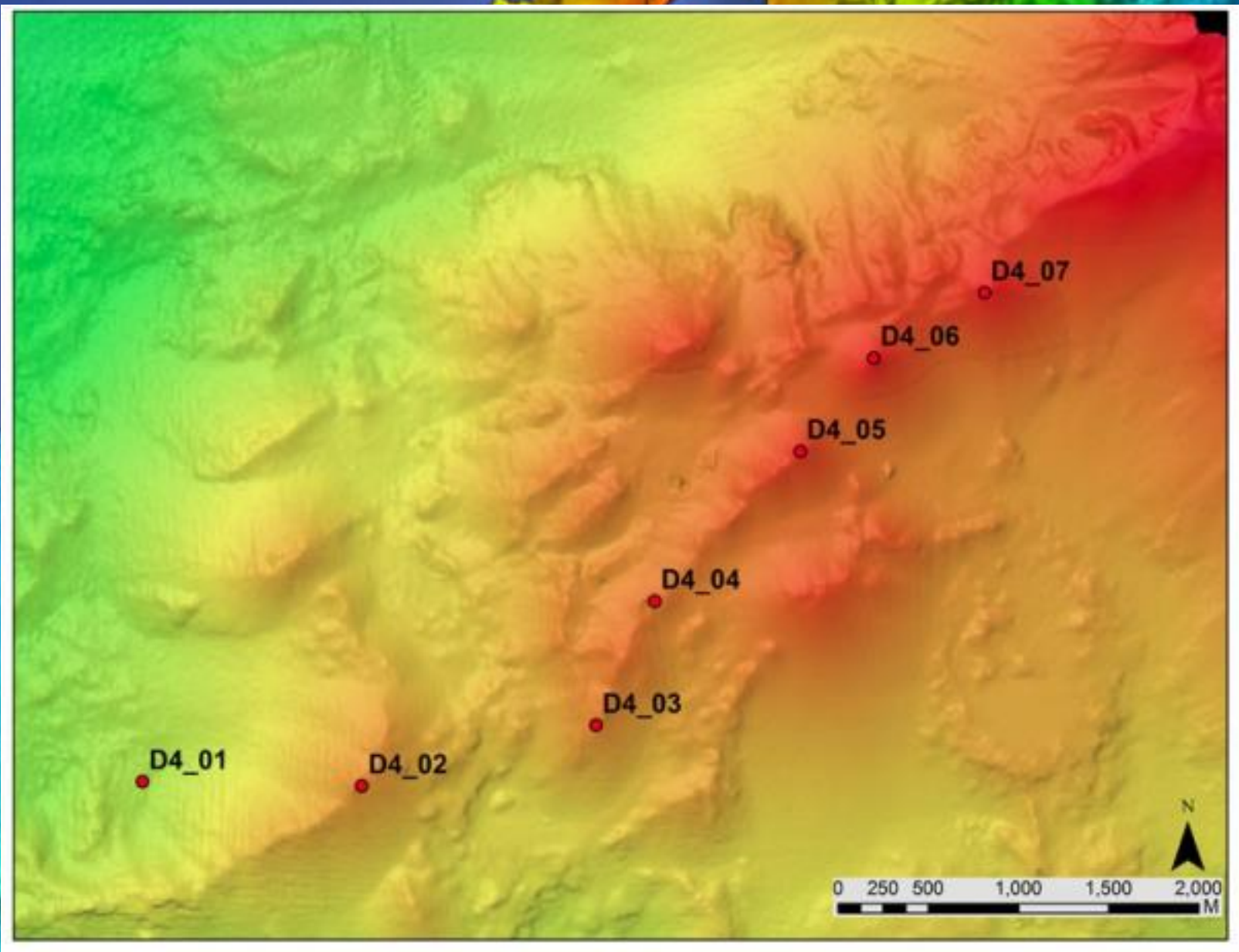
Depth
300m
1800m
3200m

Mapped: Oct. 13, 2017

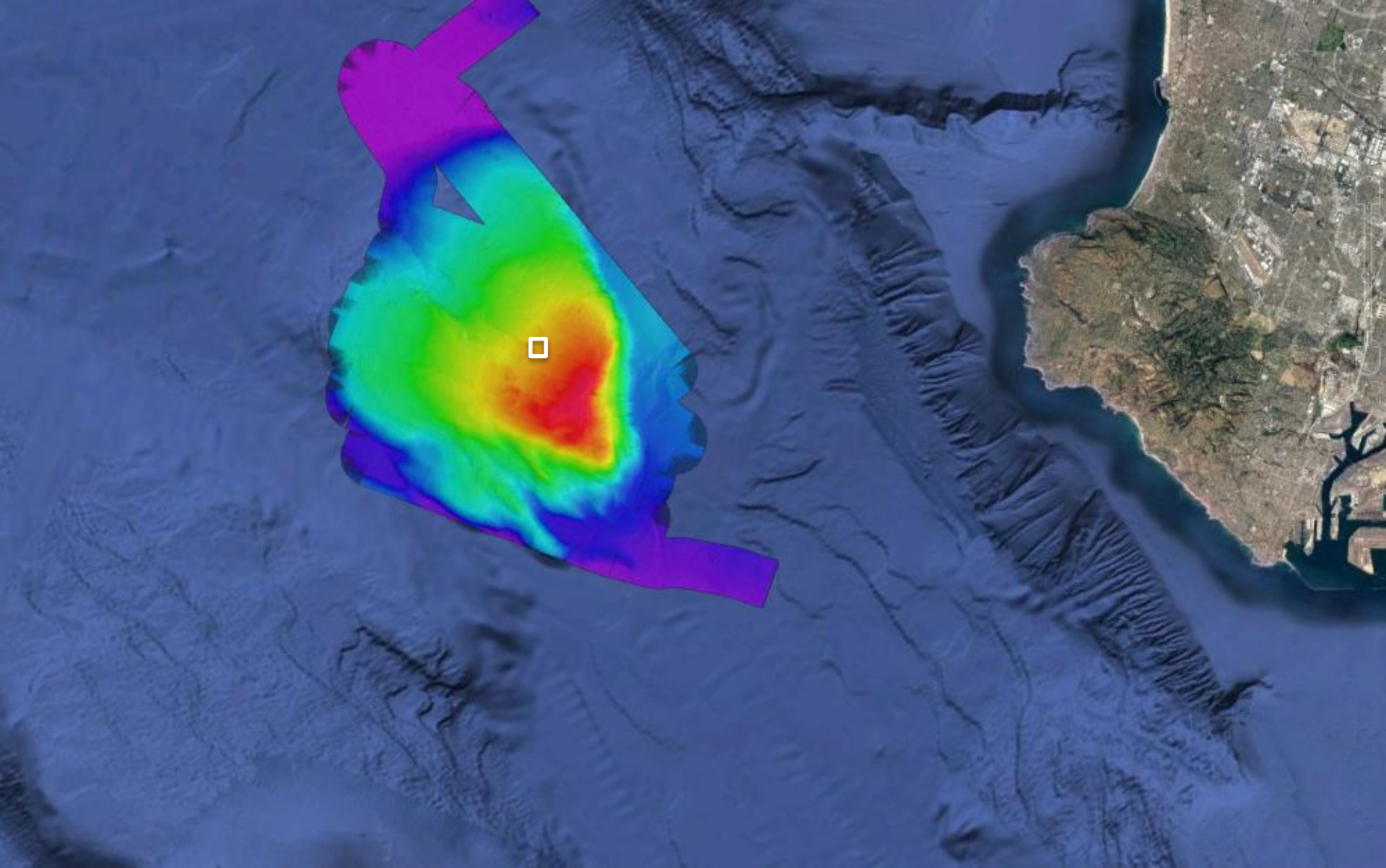
data processed with: www.gmt.org

1.7K Views





Dive 5



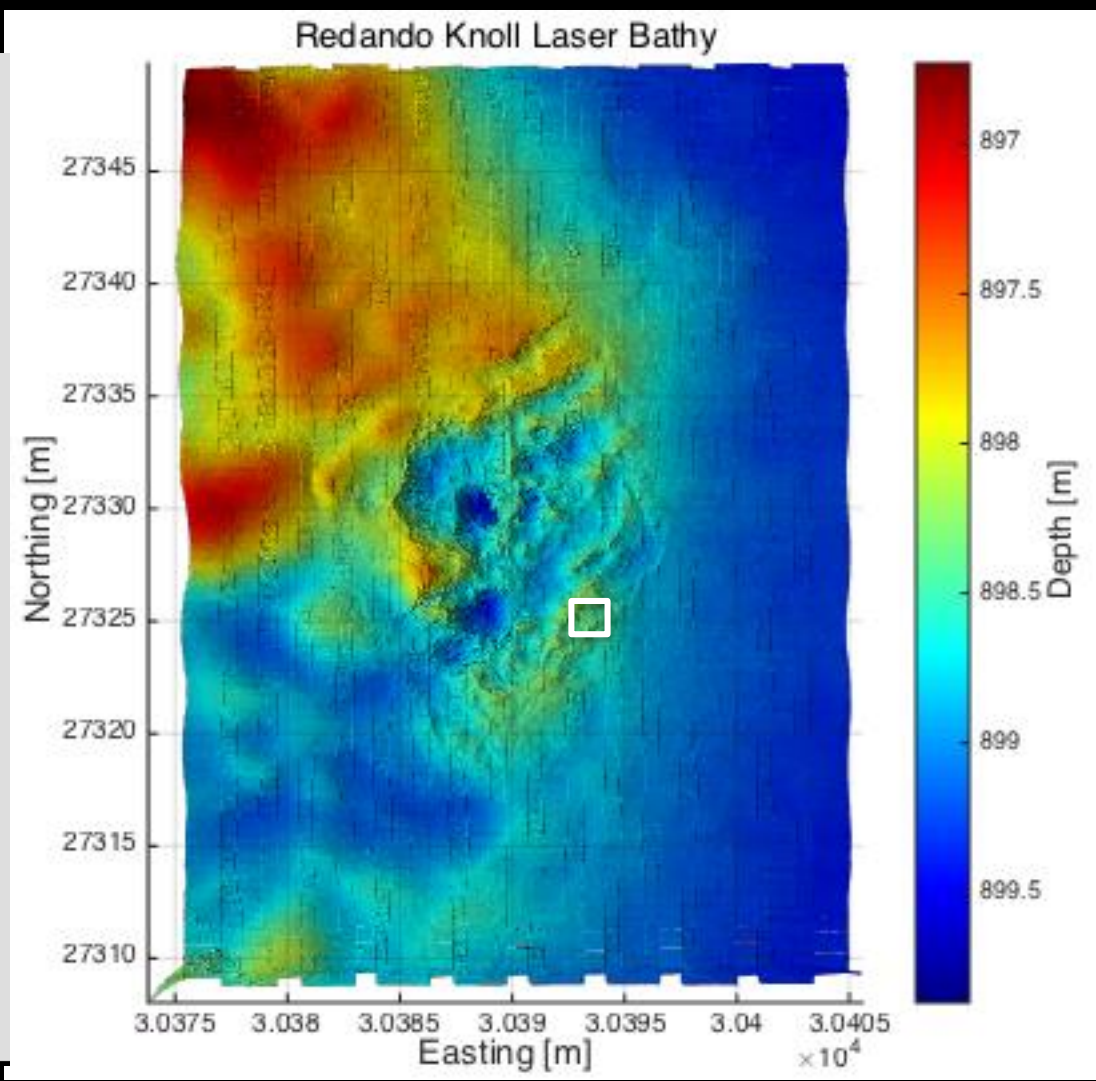
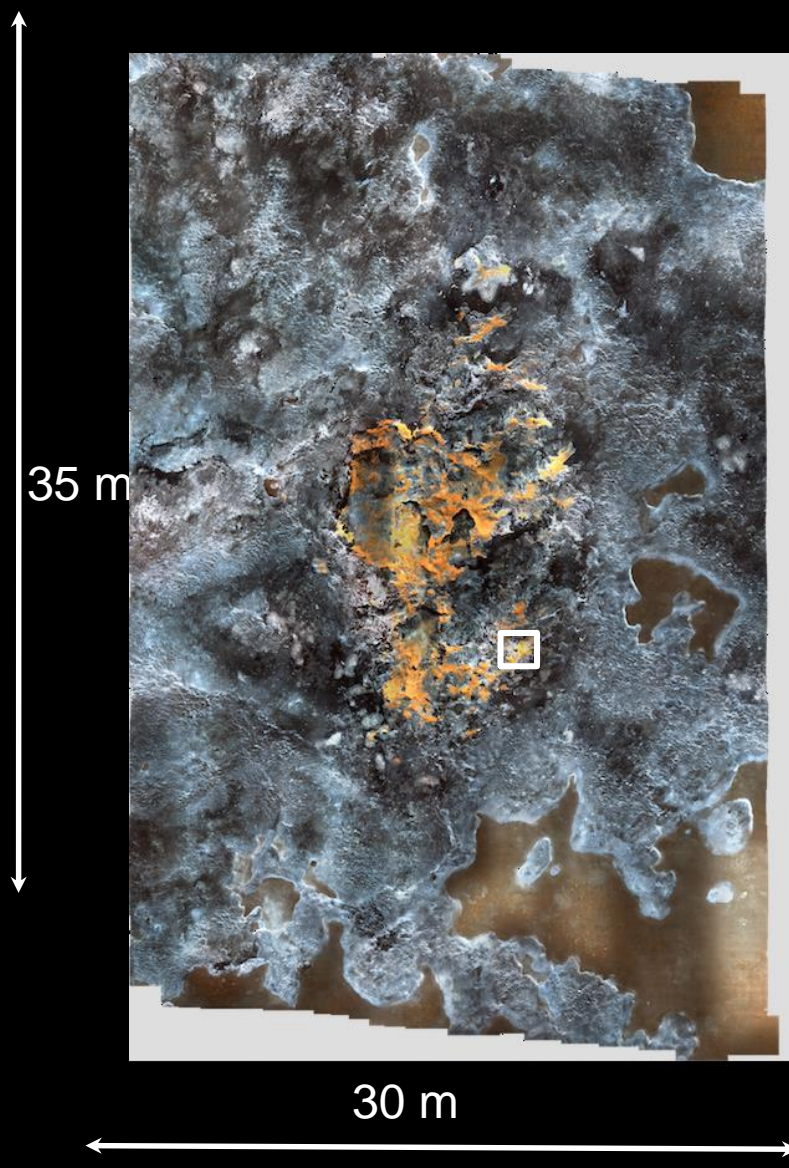
10 m grid

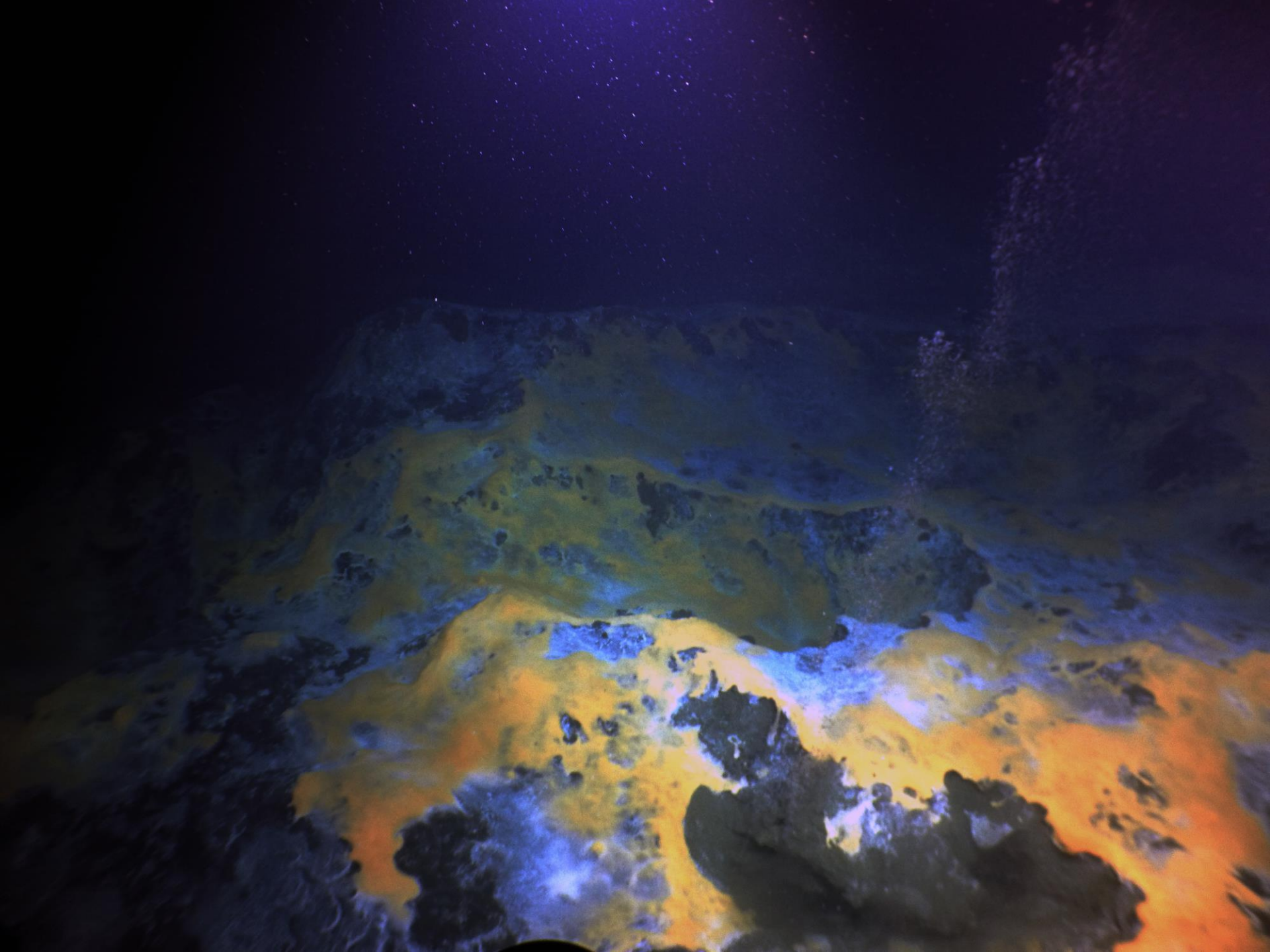


Data LDEO-Columbia, NSF, NOAA

58 m

300 m





A satellite-style map of the Pacific Ocean region, showing the western coast of North America and the Hawaiian Islands. Several callout boxes with star-shaped pointers indicate specific research sites. The background is a dark blue ocean with a faint grid of latitude and longitude lines.

OCEAN NETWORKS CANADA

CASCADIA MARGIN

PACIFIC SEAMOUNTS

MONTEREY BAY

CHANNEL ISLANDS

PAPAHĀNAUMOKUĀKEA
MARINE NATIONAL MONUMENT

LOIHI SEAMOUNT

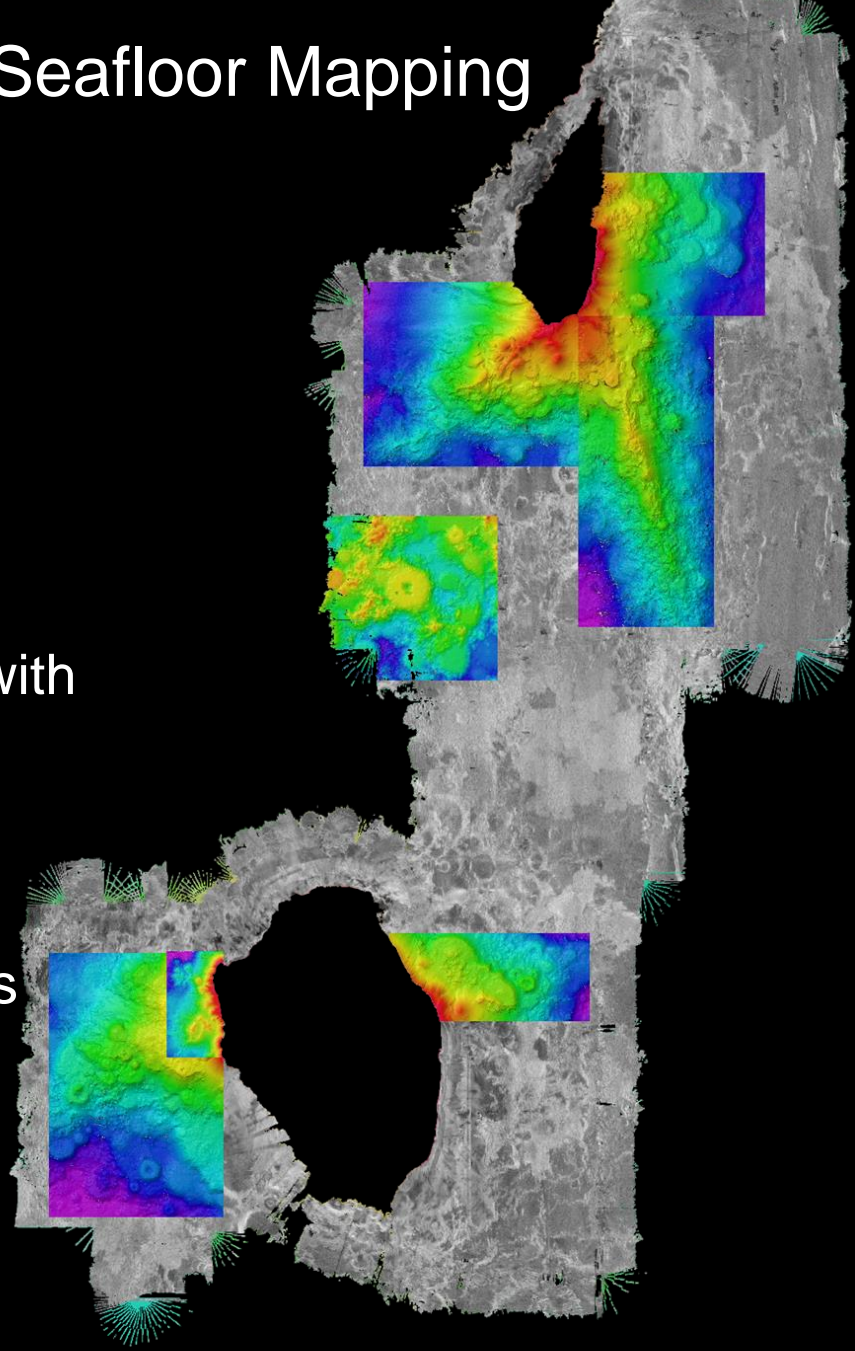
CLARION CLIPPERTON
FRACTURE ZONE

NAUTILUS LIVE

2018

Important Factors for Exploratory Seafloor Mapping

- High quality mapping data
 - Annual MAC inspection
 - Clean transducers
 - Valid sound velocity information
 - UCTD & XBTs
- All possible data types or products with links to data sources/raw data
- Metadata simplification/tools
- Data submission simplification
- Gap analysis & data quality products
- Forum for community survey plans



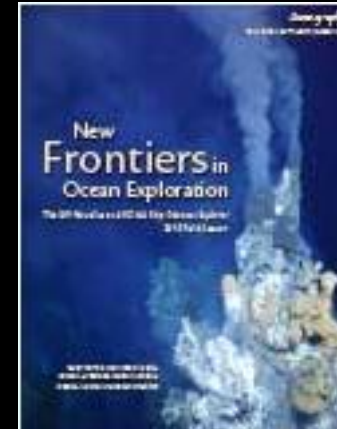
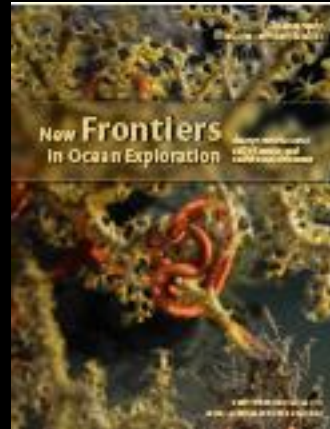


Internships: students join us at sea
Scientists Ashore: join in the discussion & provide AOIs for mapping
Ship Charters: Use *Nautilus* for your seafloor mapping project
www.oceanexplorationtrust.org
Watch at: www.nautiluslive.org



Expedition Planning & Data Availability

- Lead scientist represents wider scientific community interests
- Scientists Ashore
 - Sign up online (www.oceanexplorationtrust.org)
 - Planning calls
 - Receive cruise and dive plans and daily ship updates
- Data, video, and samples available to all after cruise
- Annual reports in a supplement published by the Oceanography Society



<http://tos.org/oceanography/issue/volume-30-issue-01-supplement>