Seafloor wonders revealed by sonar beam

- Did the nature know contour bias?-

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Coastal mapping campaign by JHOD for **multi-purpose** bathymetry

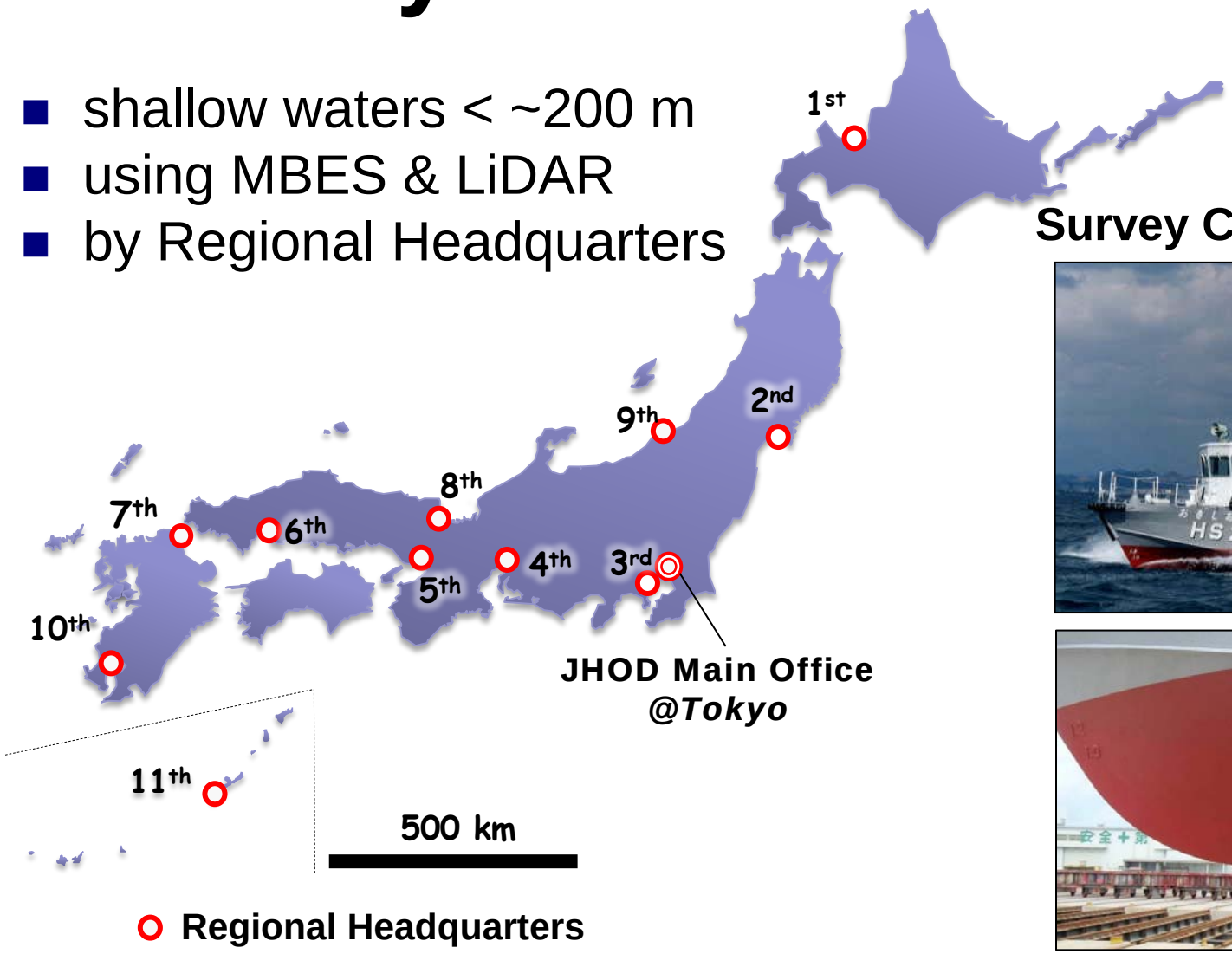
Background

- Emerging needs for full-cover bathymetric data of coastal regions
  - Natural disaster mitigation (e.g., Tsunami modeling)
  - Coastal Engineering (e.g., Renewable energy development)
  - Coastal zone management etc.

- Sparse and low-reliable sounding data based on outdated surveys *(in areas of low priorities for safety navigation)*
  - using leadlines and singlebeam echosounders
  - based on horizontal positioning systems with large uncertainty

Survey outlines

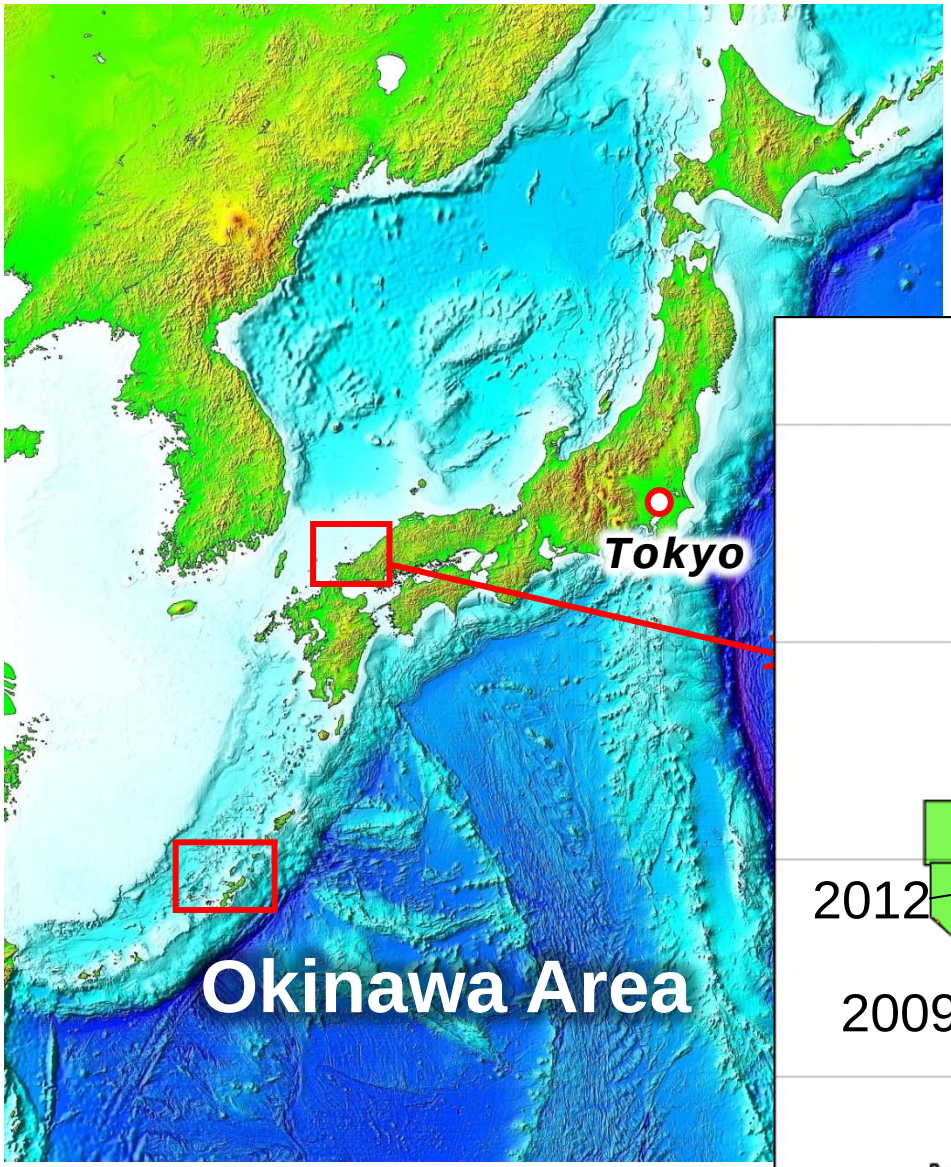
- shallow waters < ~200 m
- using MBES & LiDAR
- by Regional Headquarters



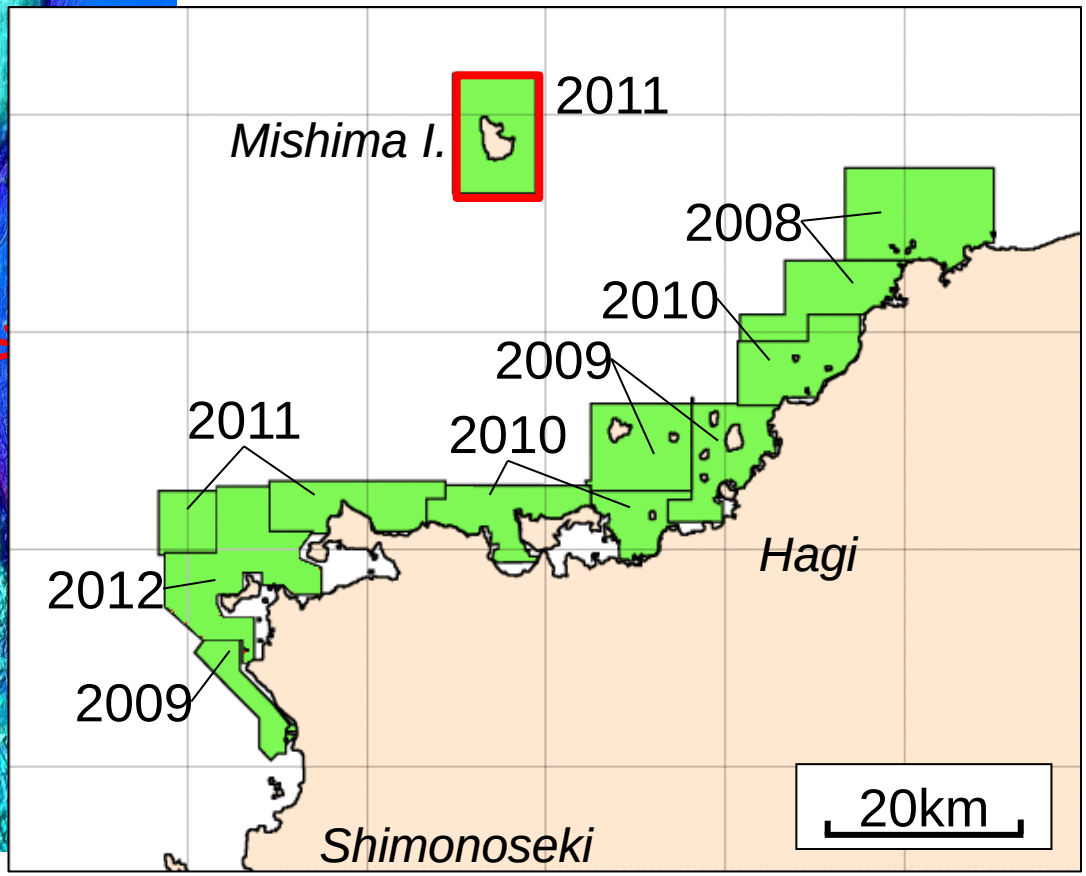
Survey Crafts (27 ton, 20 m)

SeaBat7101, 8101 (RESON), EM3002 (Kongsberg) , etc.

Topics of my talk



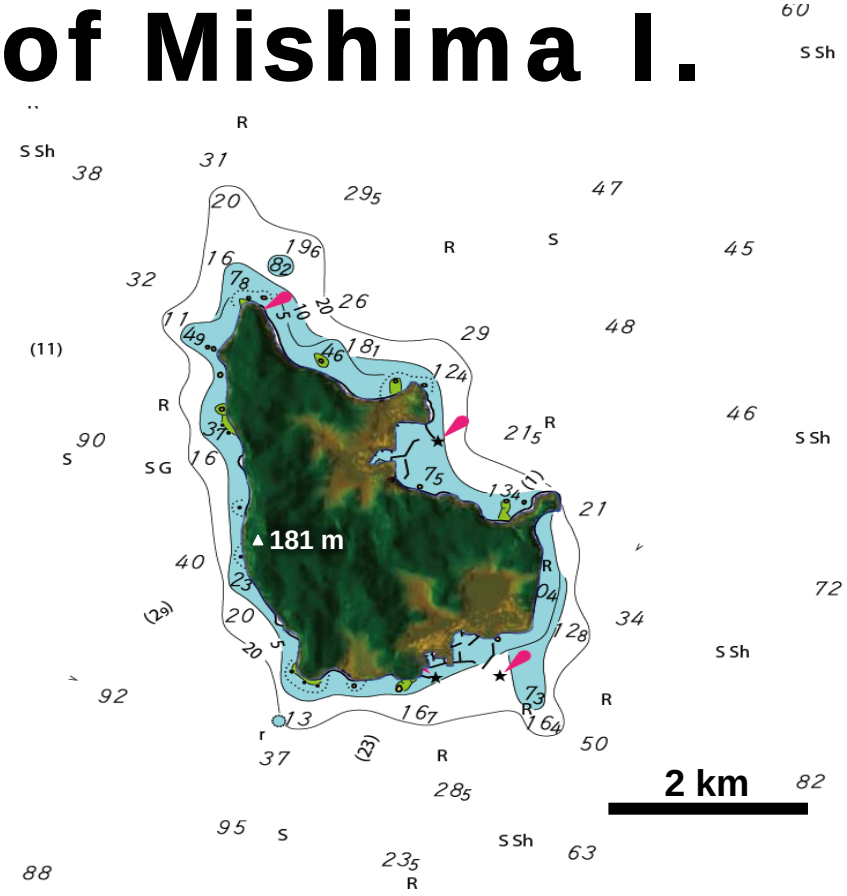
Mishima I. Area



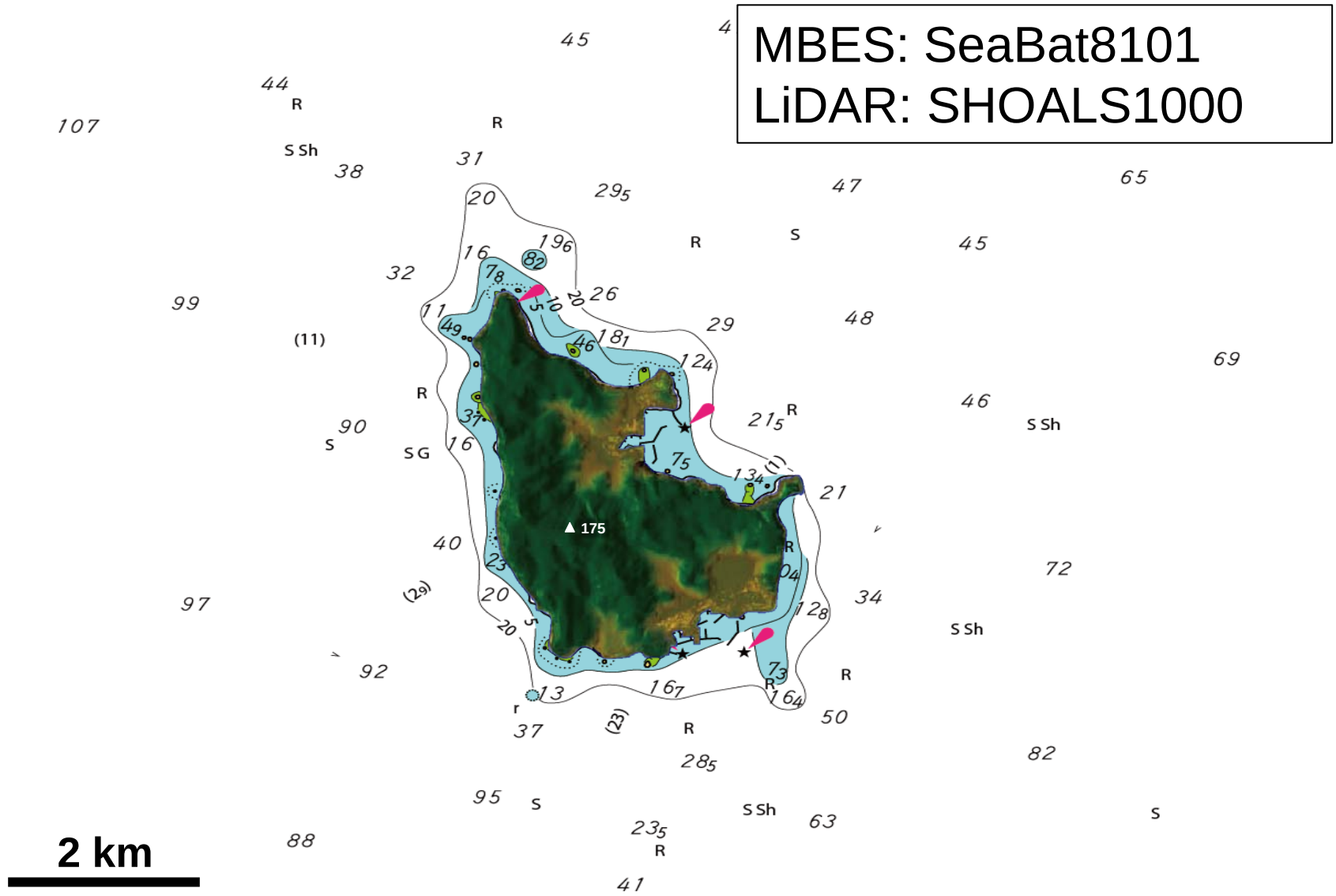
Brief overviews of Mishima I.

- Geography
  - area: 7.7 km^2
  - population: 1000

- Topography and Geology
  - eroded shield volcano
  - basaltic rocks of 12 - 8 Ma

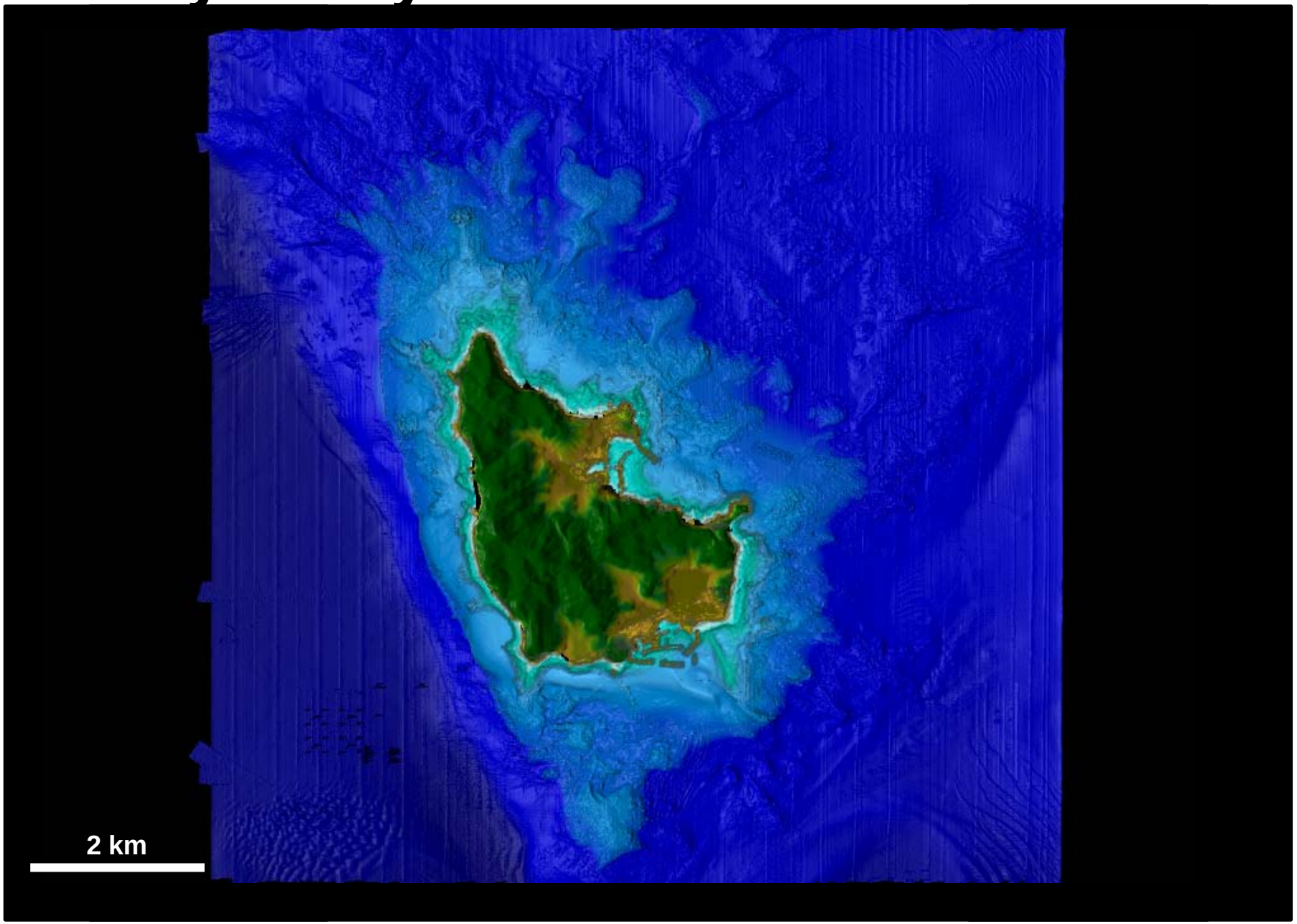


Survey of Mishima Island Area



Bathymetry of Mishima I.

surveyed in 2011



Bathymetry of Mishima I.

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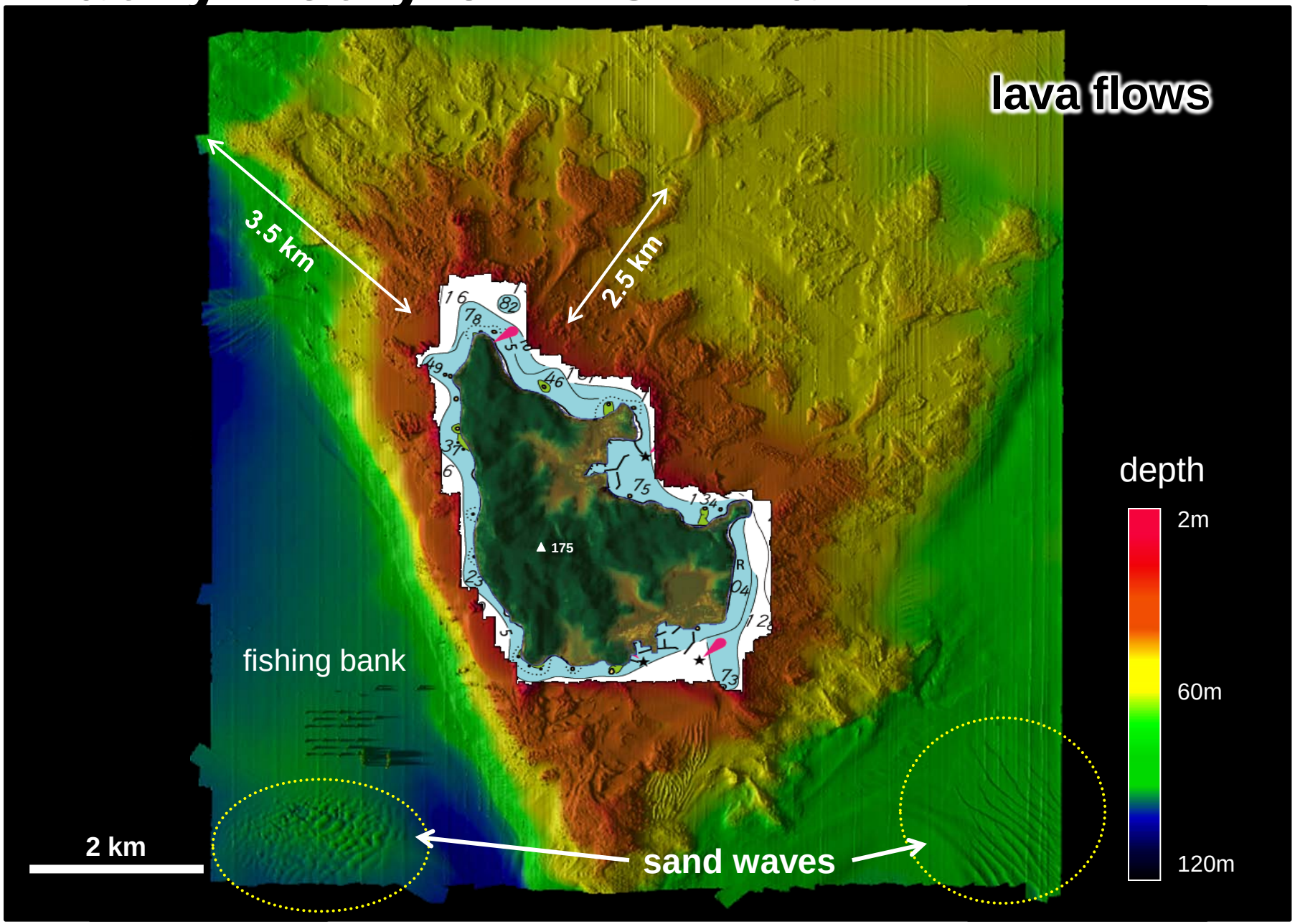
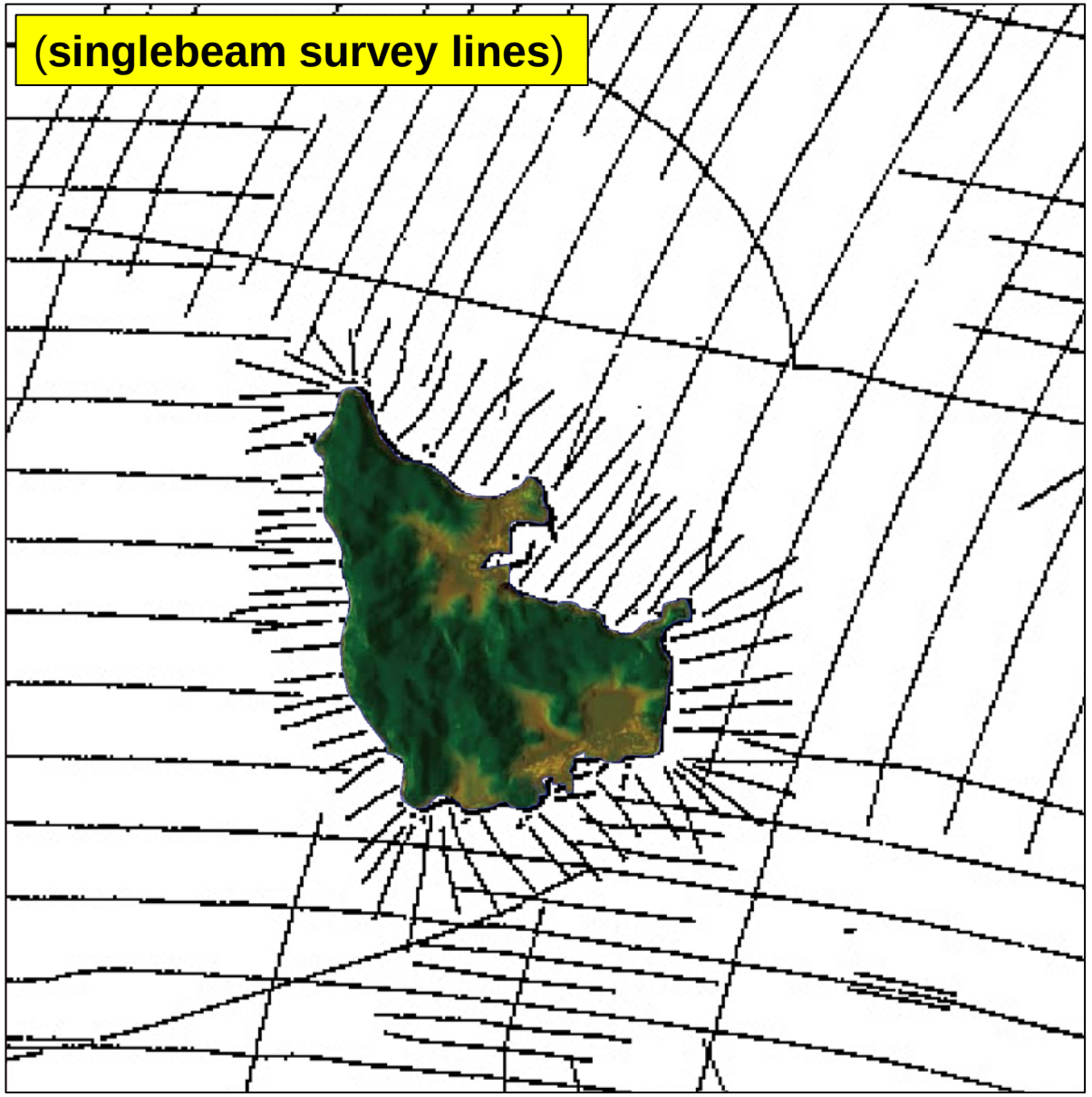


“Classic” survey

surveyed in 1978



“Classic” survey

surveyed in 1978

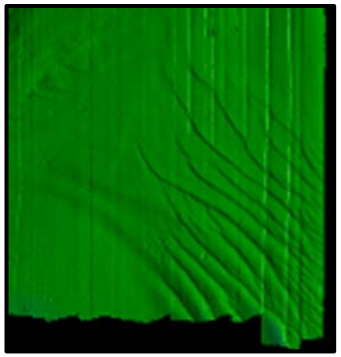
(manually-drawn map)

“ridges/spurs”

“lava flows”

MBES survey

MBES survey

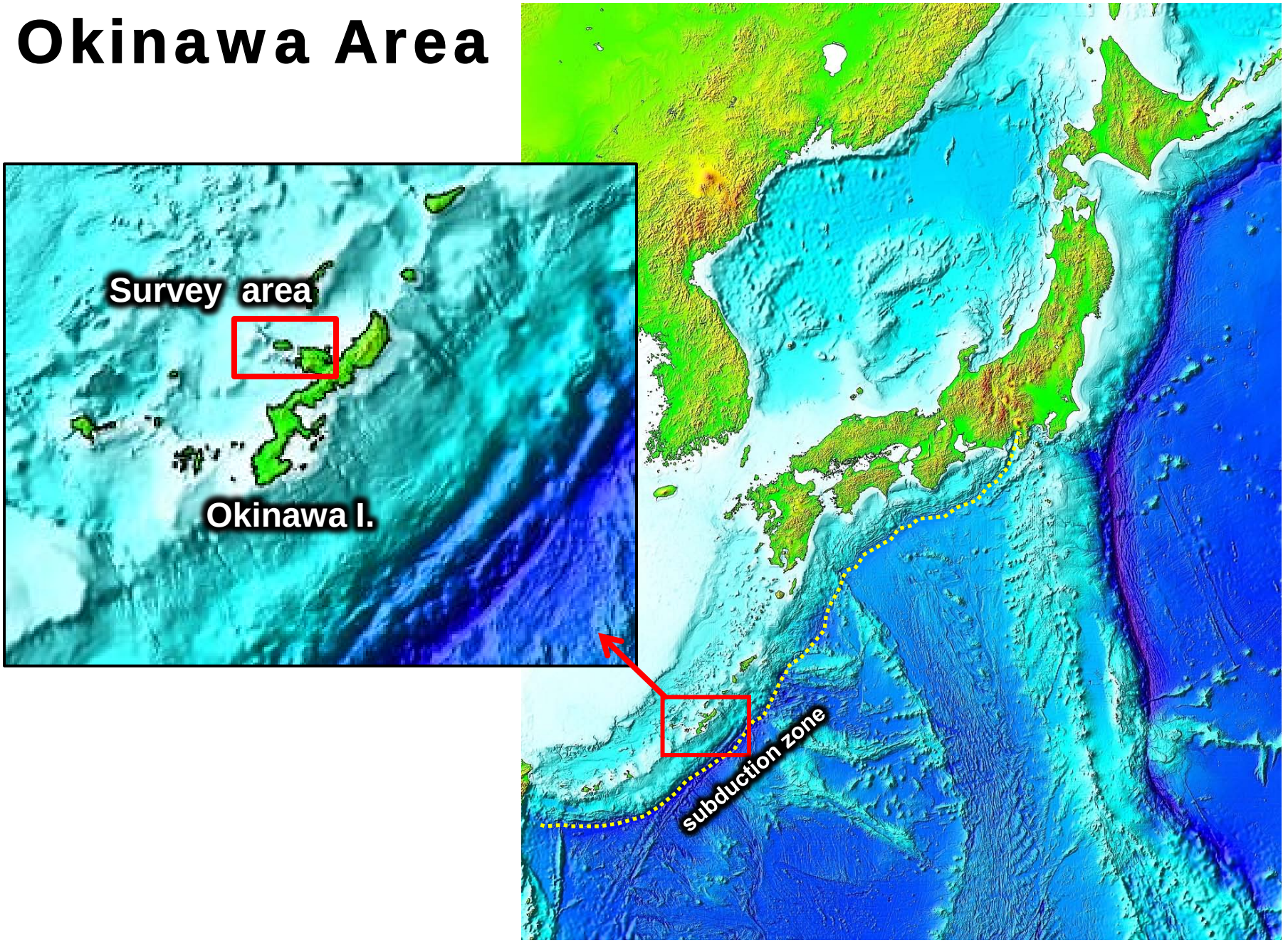


~~rotated??~~

sand waves

2 km

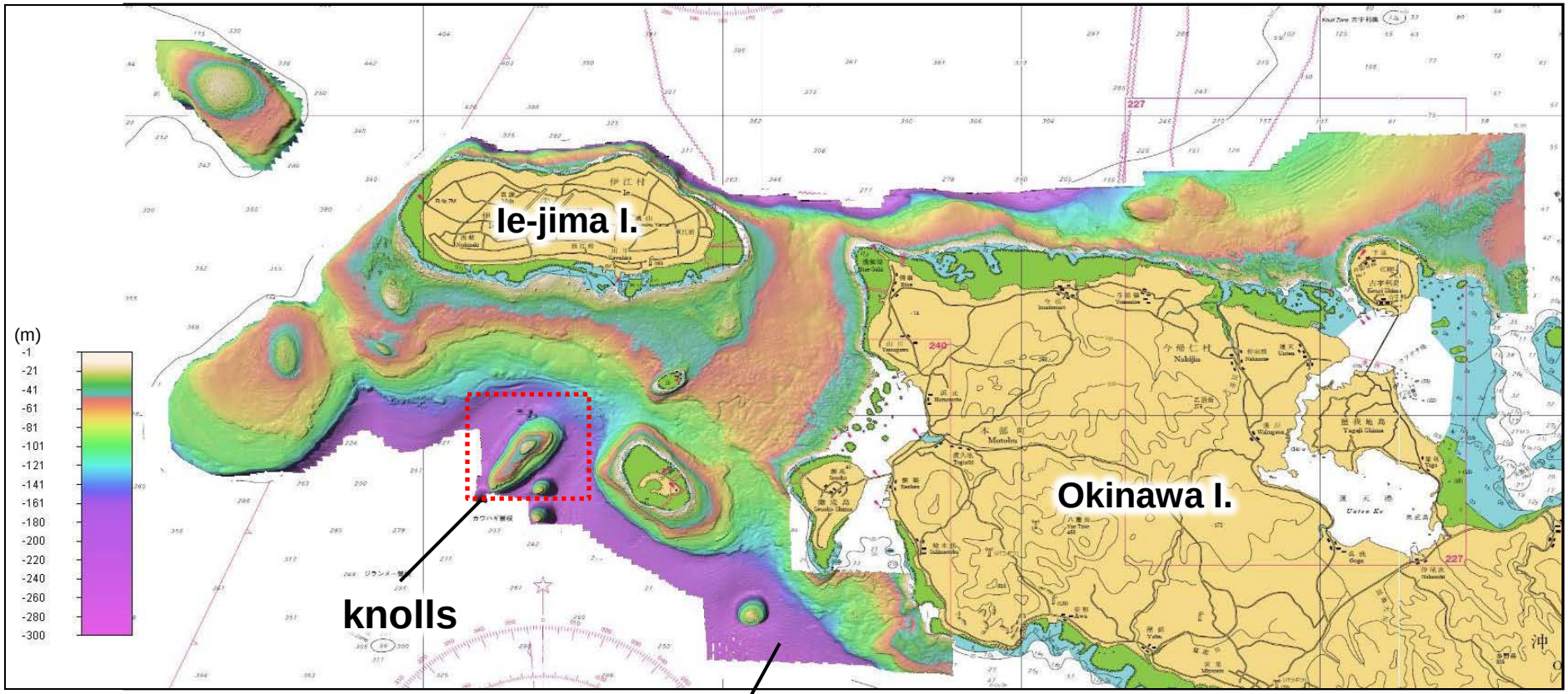
Okinawa Area



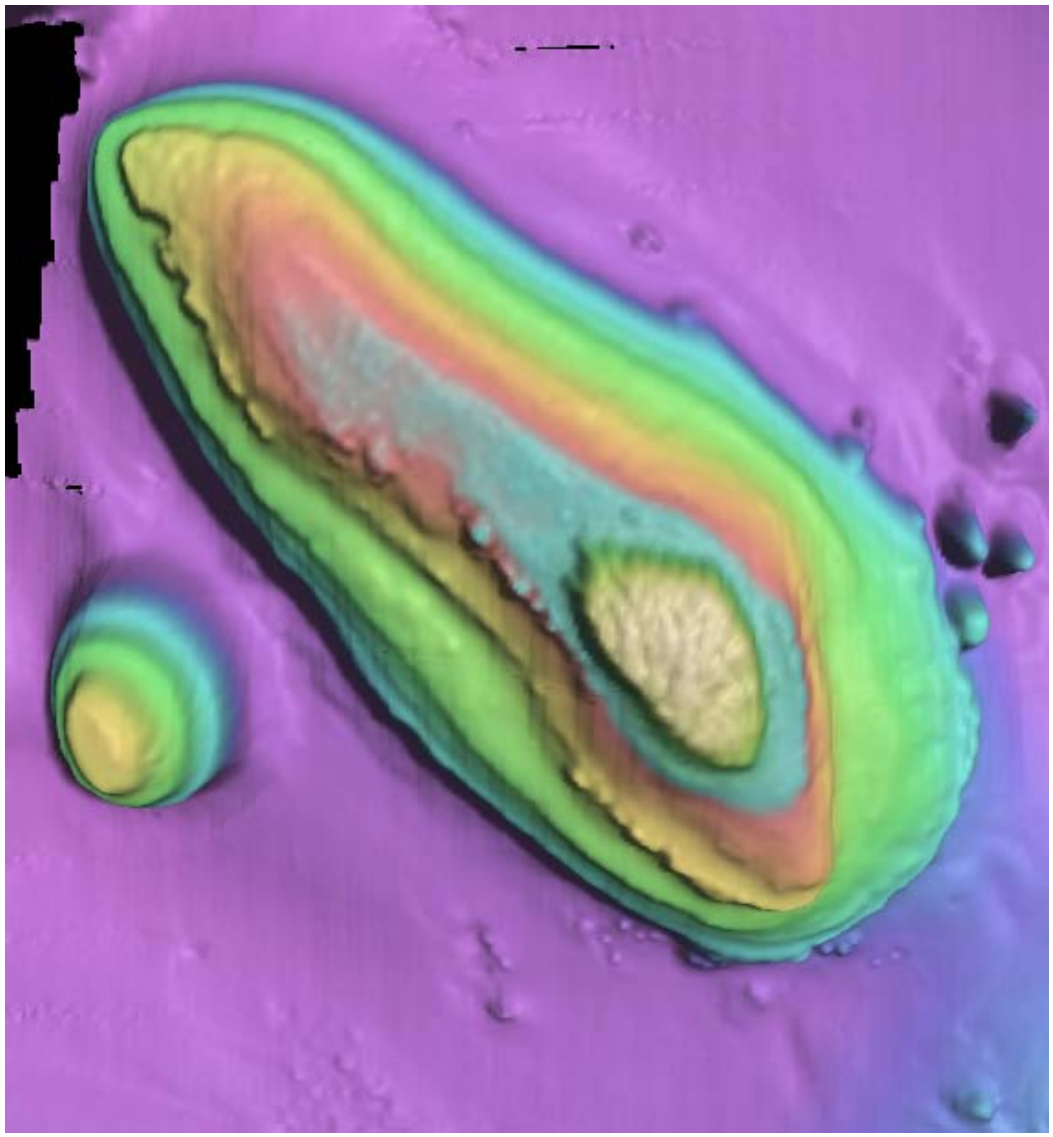
Okinawa Area

- Coral reef is widely-developed around these lands.
- The MBES mapping surveys were carried out around the NW coast of Okinawa Island in 2011.

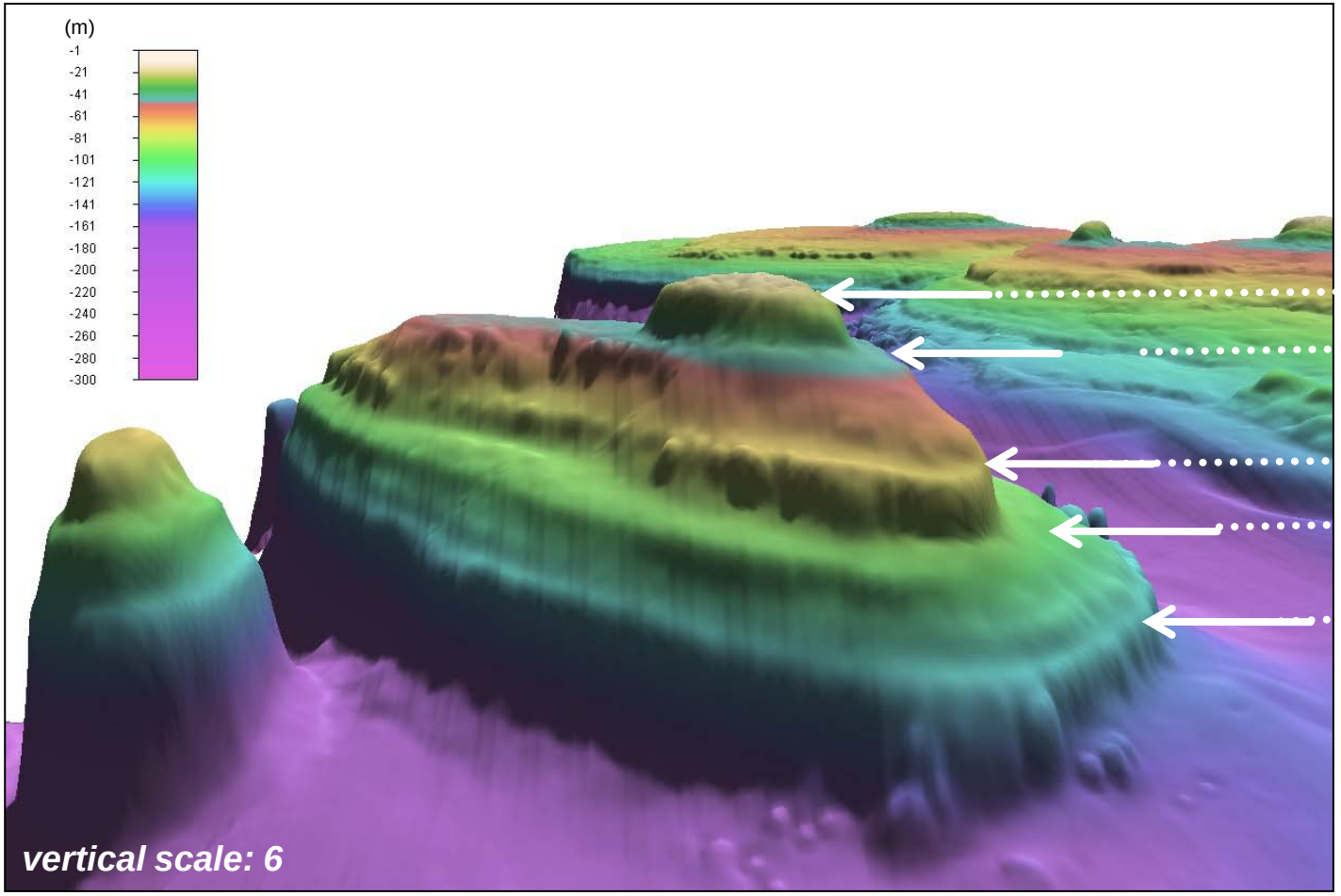
Okinawa Area



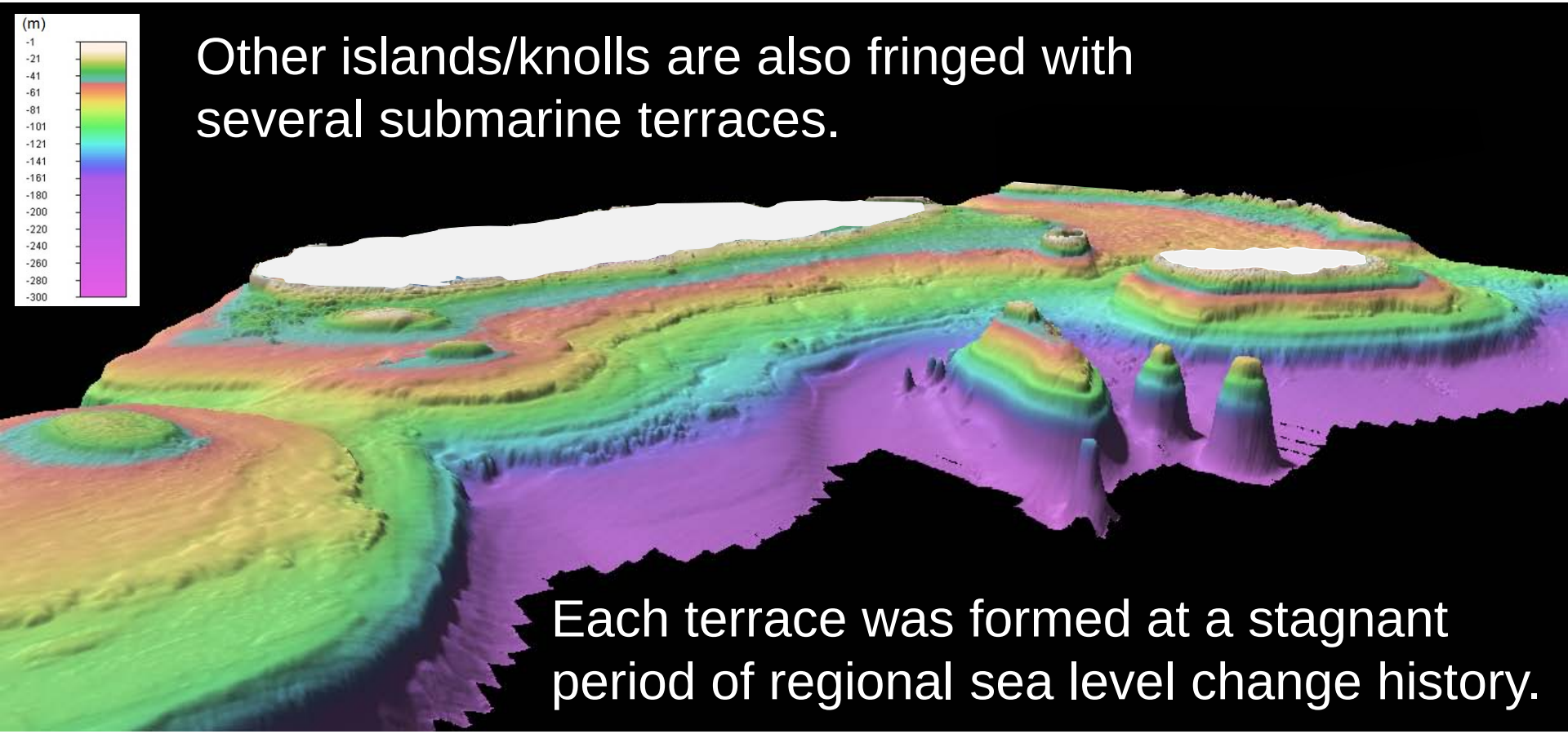
Contour-biased??



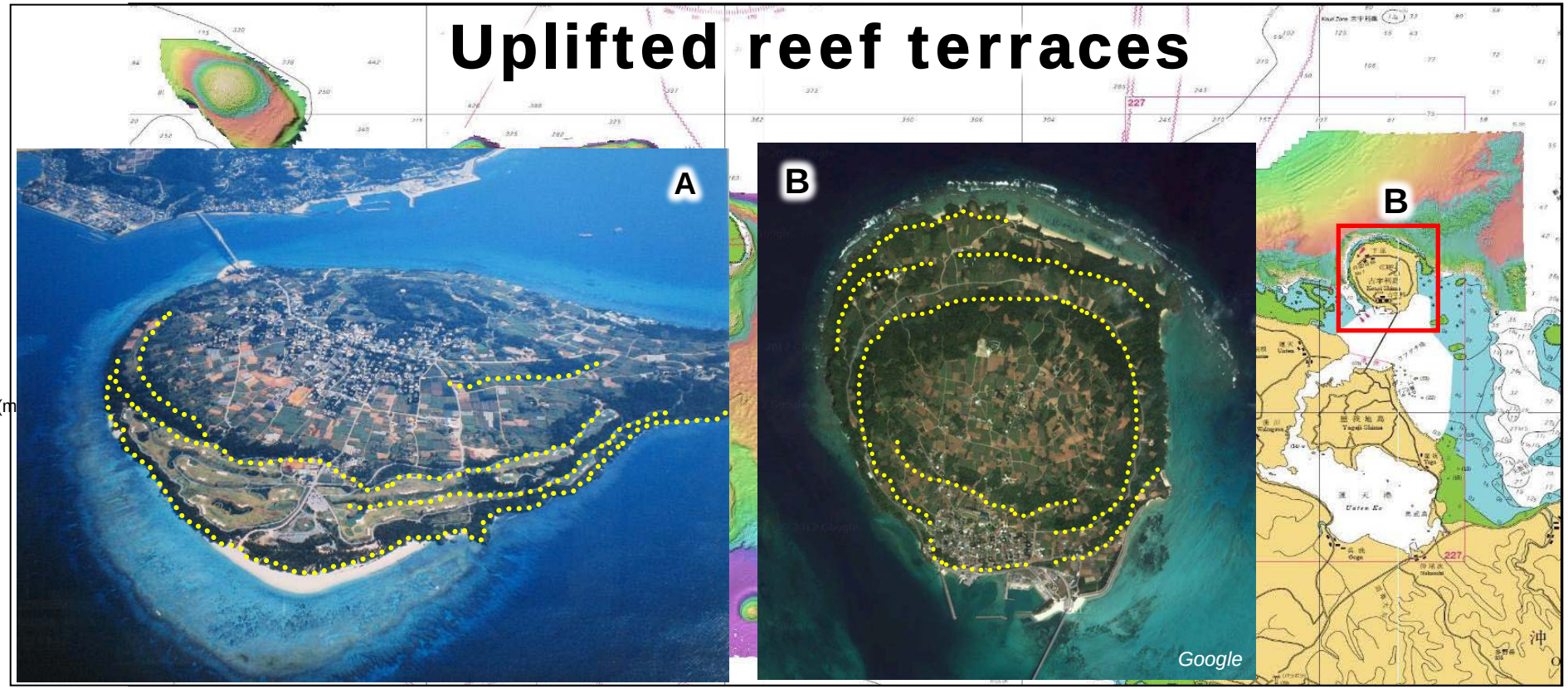
Submarine reefal terraces



Submarine reefal terraces



Uplifted reef terraces



- Many of geo-chronological studies focus on these uplifted terraces, which may records sea levels during Quaternary.
- For understanding sea level change history, studies on submarine terraces are also necessary.

Summary

- High-resolution and full-coverage bathymetric surveys reveal detailed seafloor morphology, which provides us with important implications on the geological/ geomorphological processes.

- The bathymetric data will contribute to safety navigation but also science and other maritime activities.

Thank you very much!