

# Virgin dive of JHOD's new AUV to a volcanic caldera and new findings

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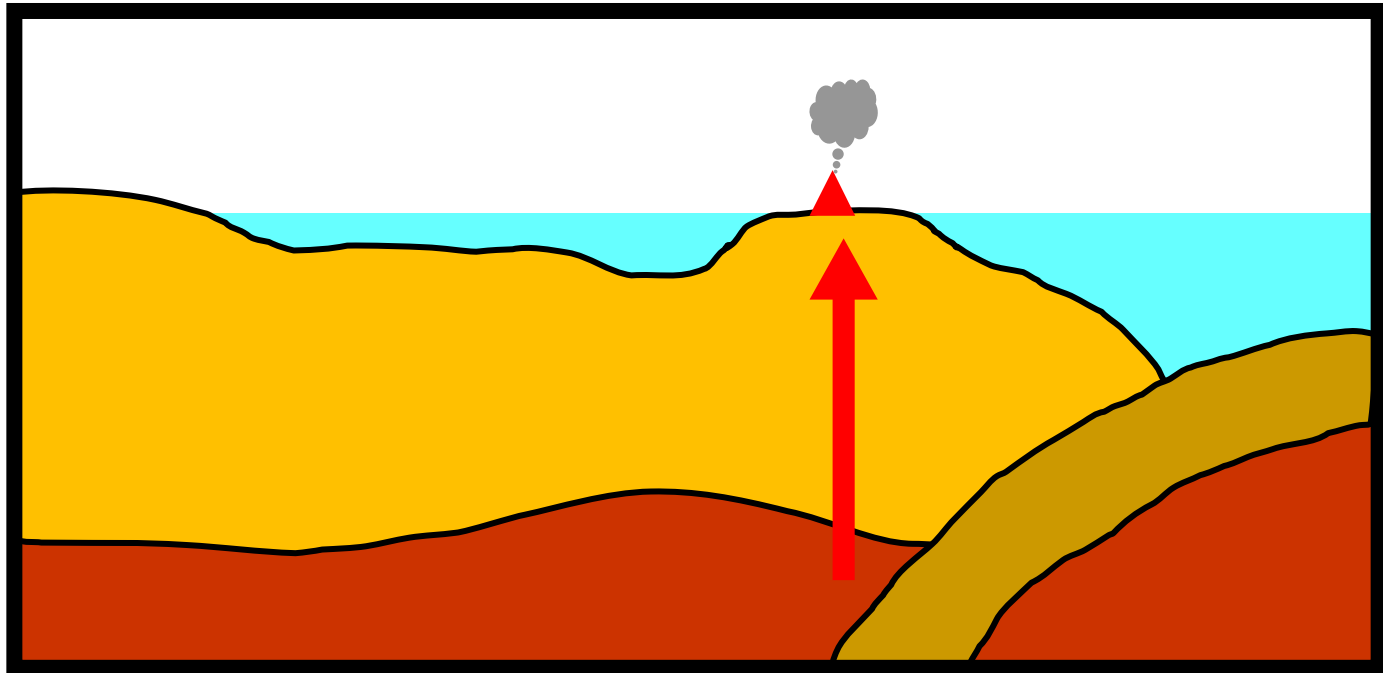
Continental Shelf Surveys Officer (as an AUV manager), JHOD

# Quiz : Who is he ?



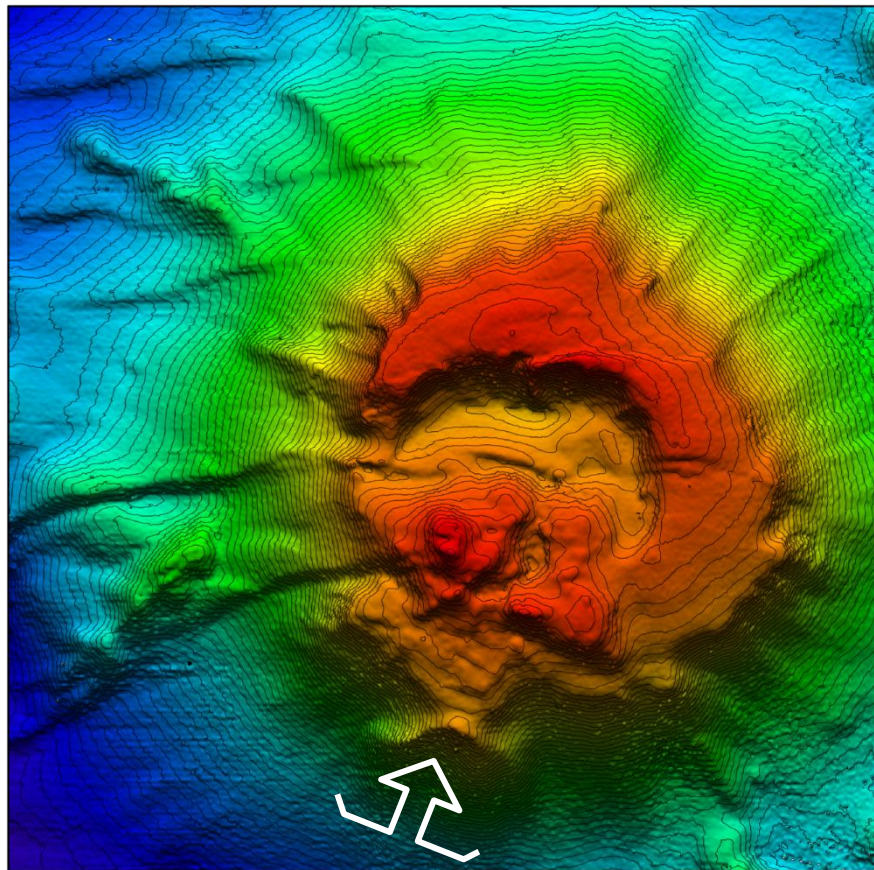
September 23 to 27, 2013 SCUFN in Japan

# Study area and tectonic setting



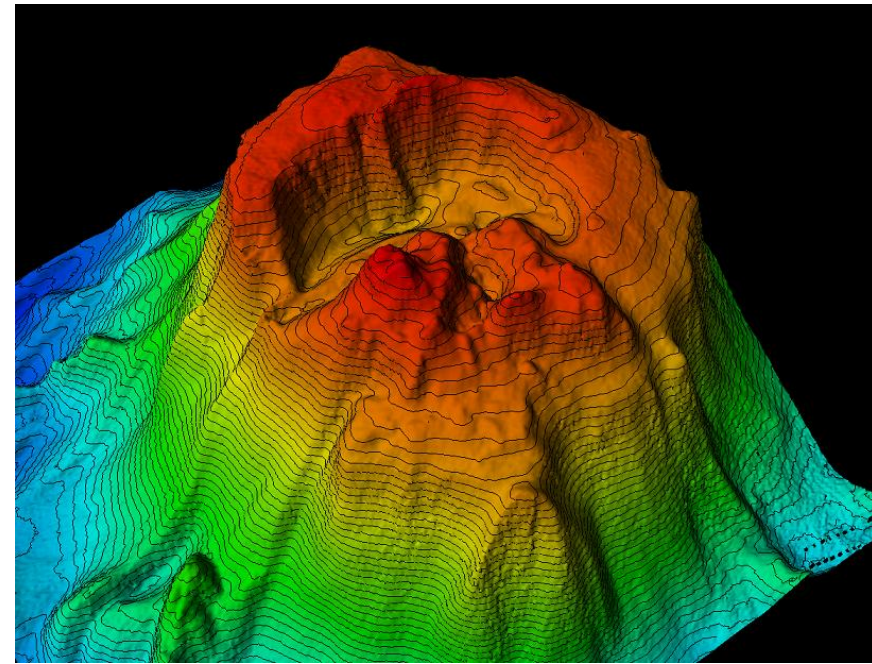
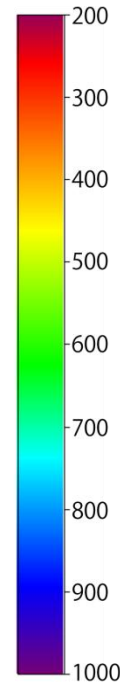
The study area is located just on the active volcanic front.

# Daiichi-Amami-Knoll



Bathymetry acquired by S/V *Takuyo* (MBES EM122 12 kHz)  
Illumination angle 0°, Contour interval 10 m

Depth (m)



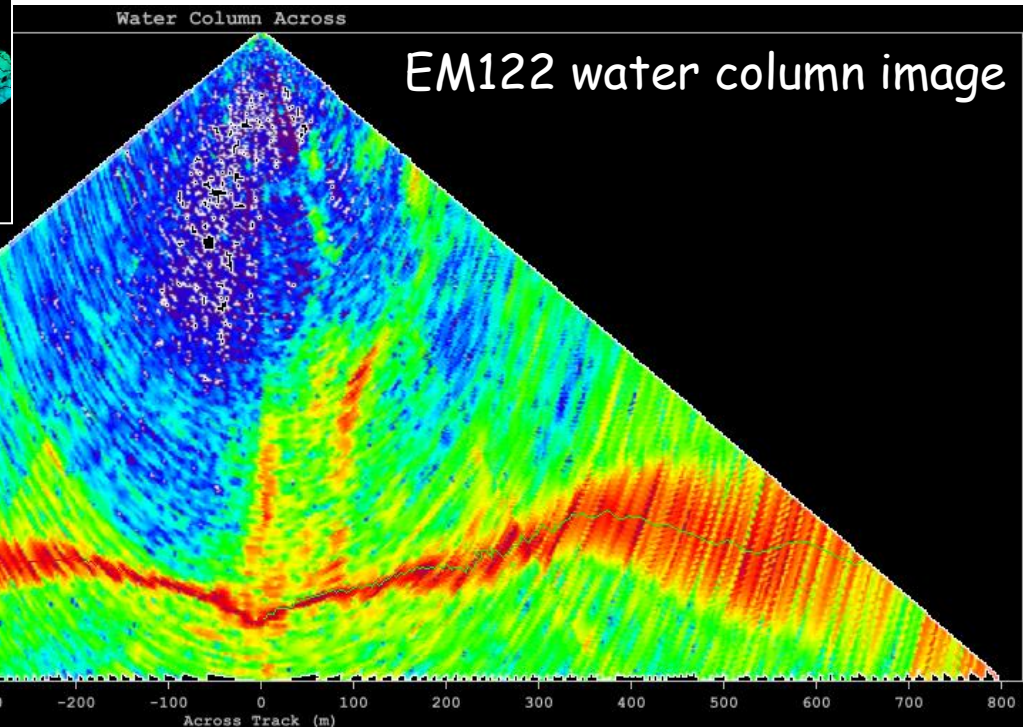
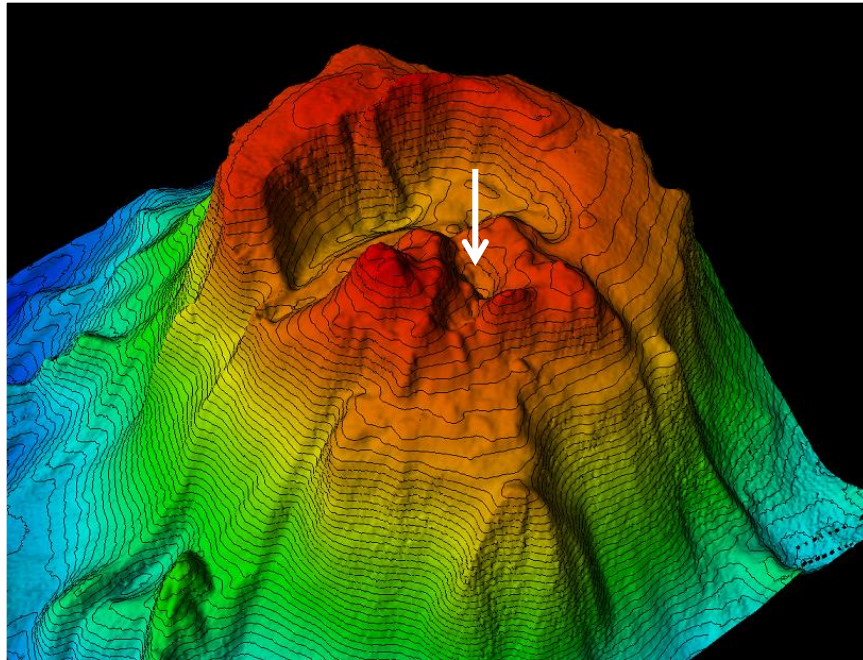
Vertical exaggeration 5 times, Contour interval 10 m  
Illumination angle 45° at 55° above horizontal

Relative Height : ~ 700 m

Shallowest Depth : 245 m

Size of the Caldera: ~ 1.5 km

# Plumes in Water Column Image



AUV was deployed to figure out details of the Plumes.

# AUV "Gondou"



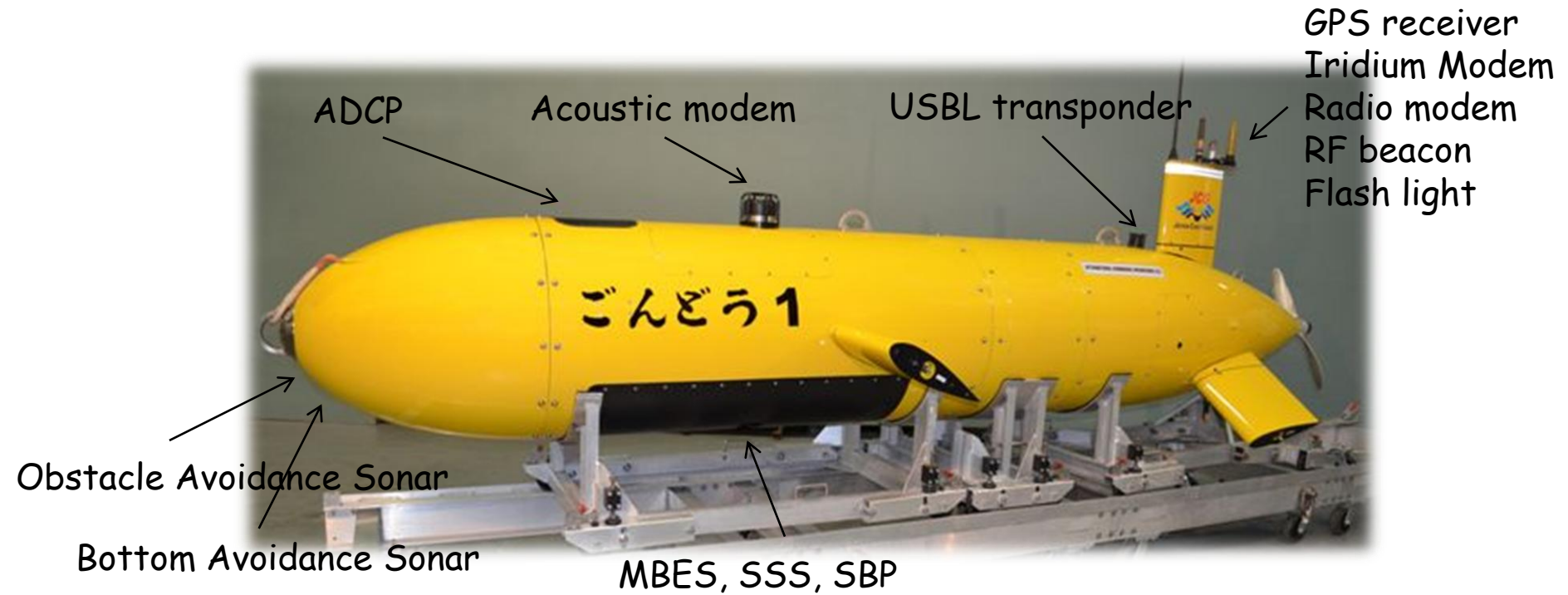
Manufacture	International Submarine Engineering Limited
Length	4.3 m
Weight	610 kg
Speed	3 knot (Max. 5 knots)



*Gondou* (Japanese)  
= *Pilot Whale*

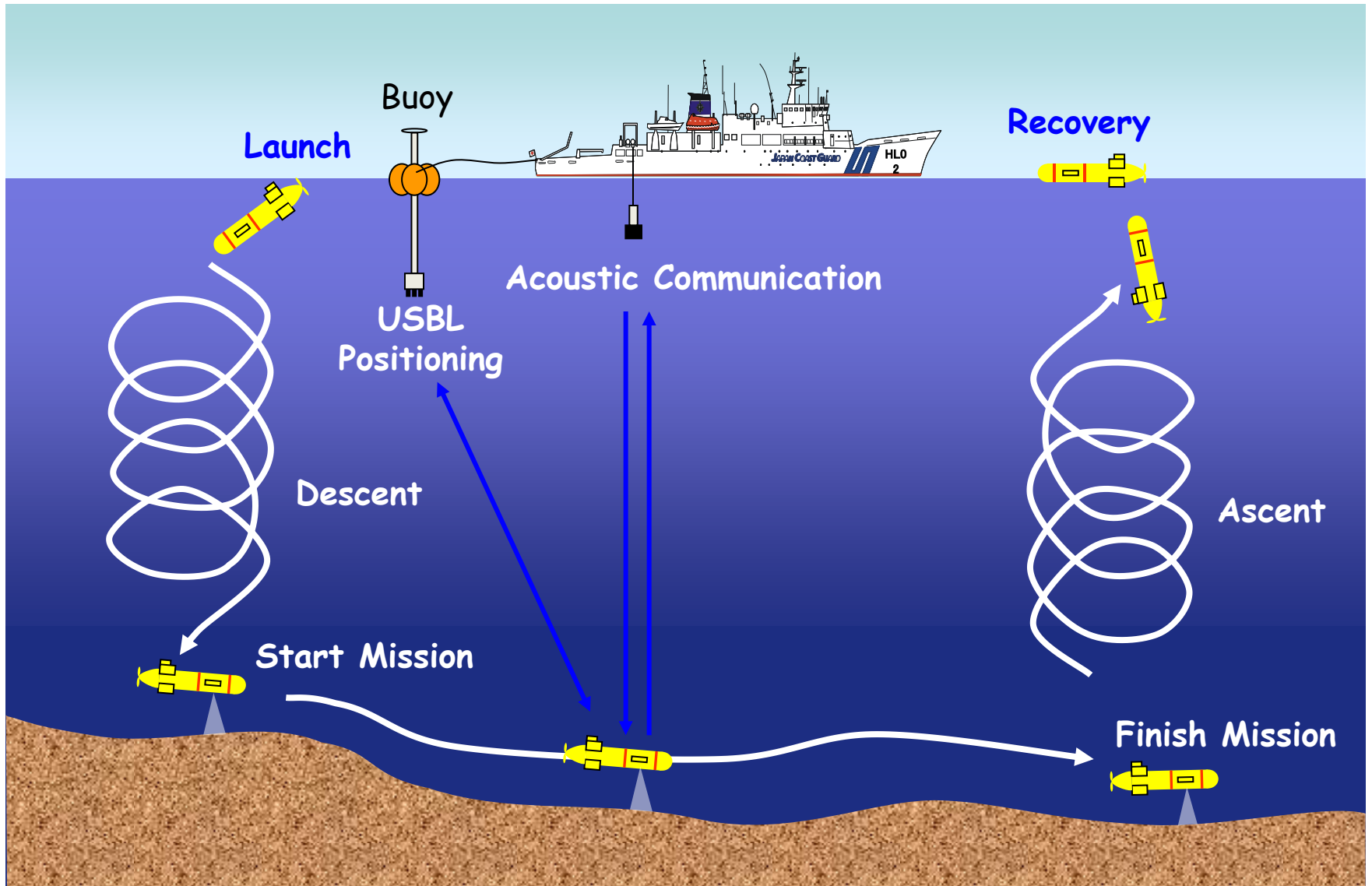
Reference <http://www.plus-hawaii.com>

# Payloads on "GONDOU"



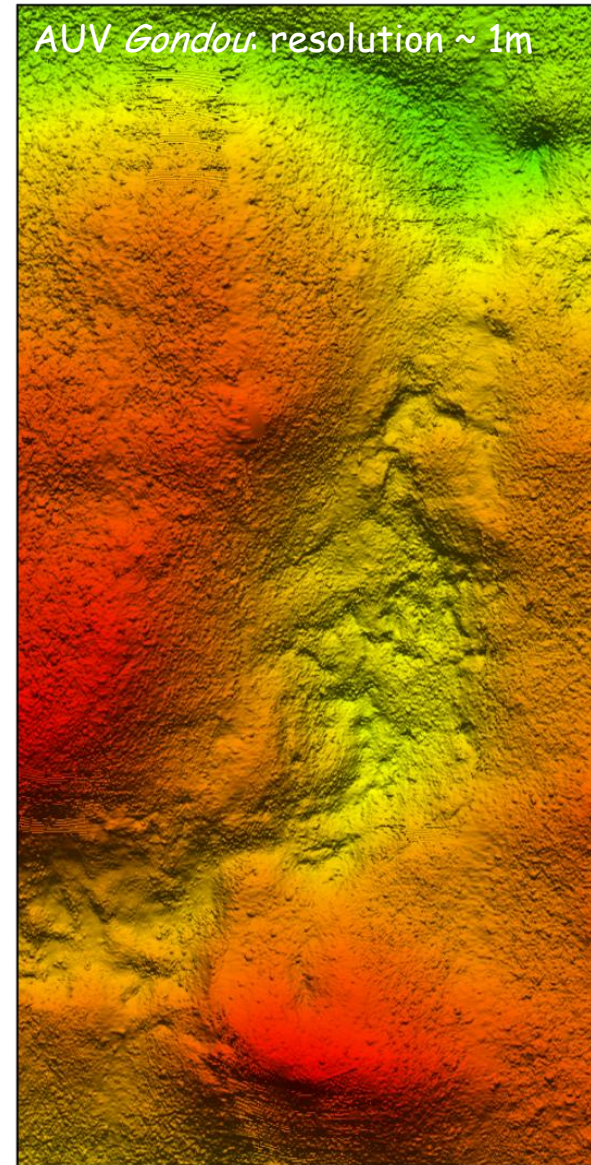
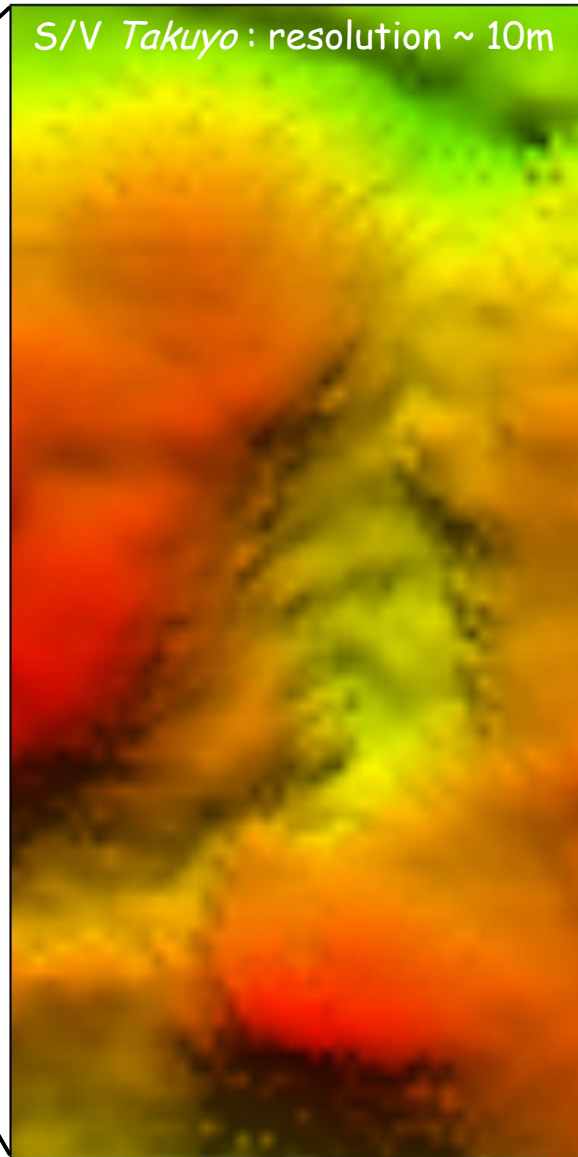
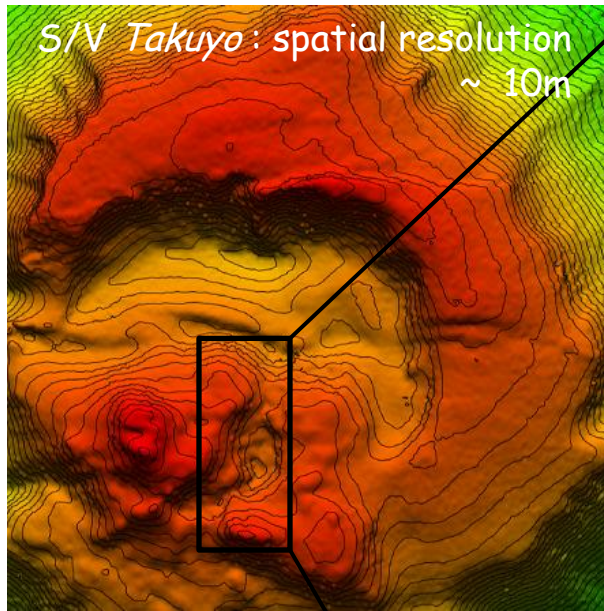
Sensor	Model
Multibeam Echo Sounder	R2Sonic 2022 200-400 kHz
Side Scan Sonar	EdgeTech 2200-M 120/410 kHz
Sub-bottom Profiler	EdgeTech DW424 4-24 kHz
CTD	SeaBird 49 FastCAT
ADCP	Workhorse Navigator 300 kHz

# AUV Operation

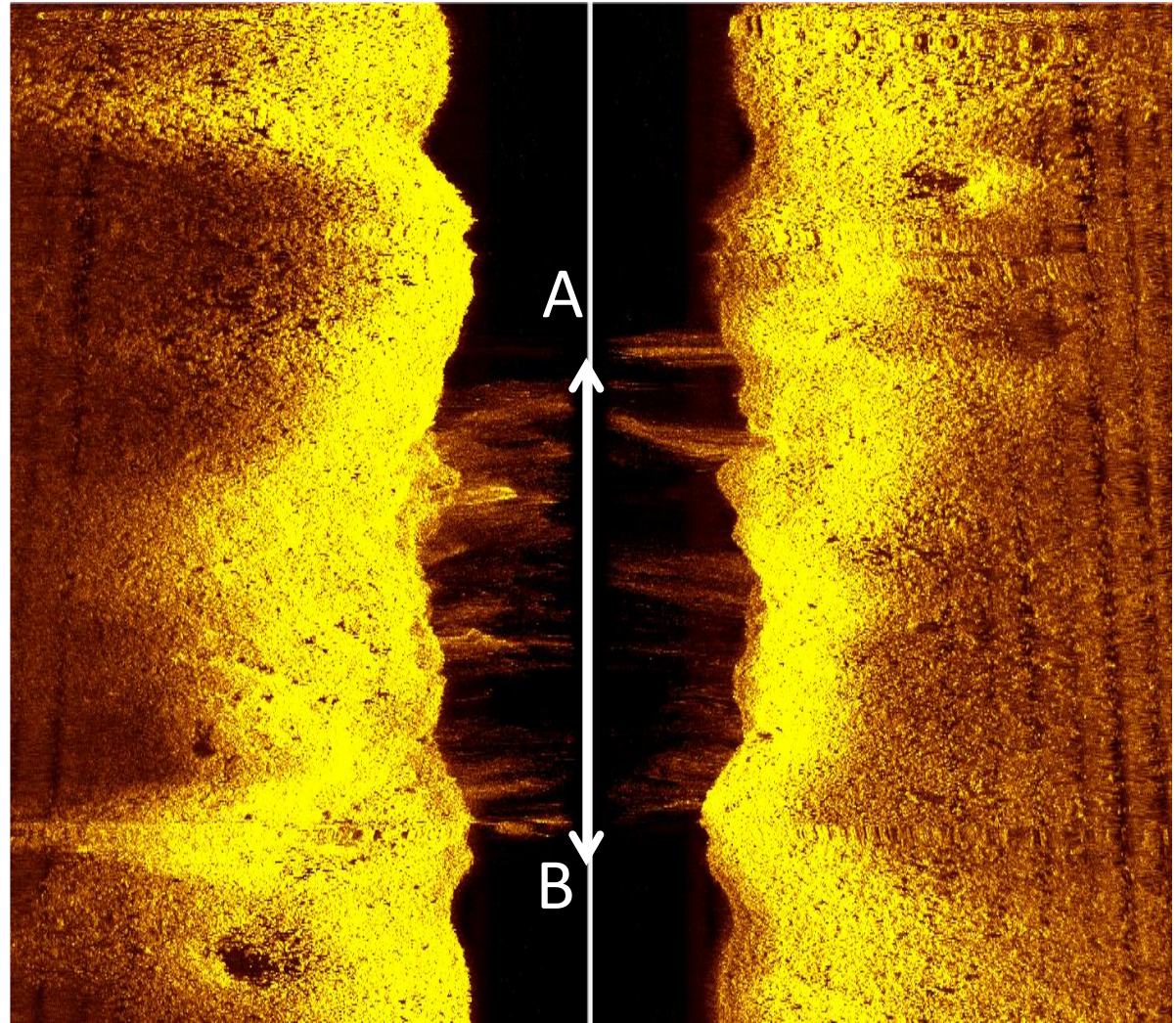
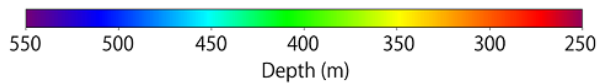
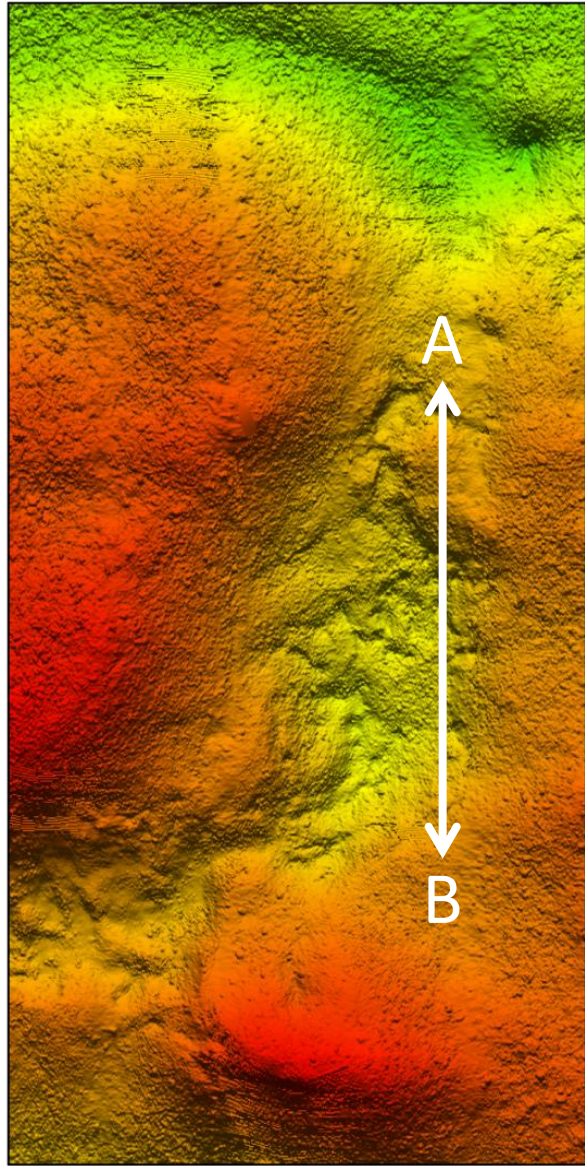




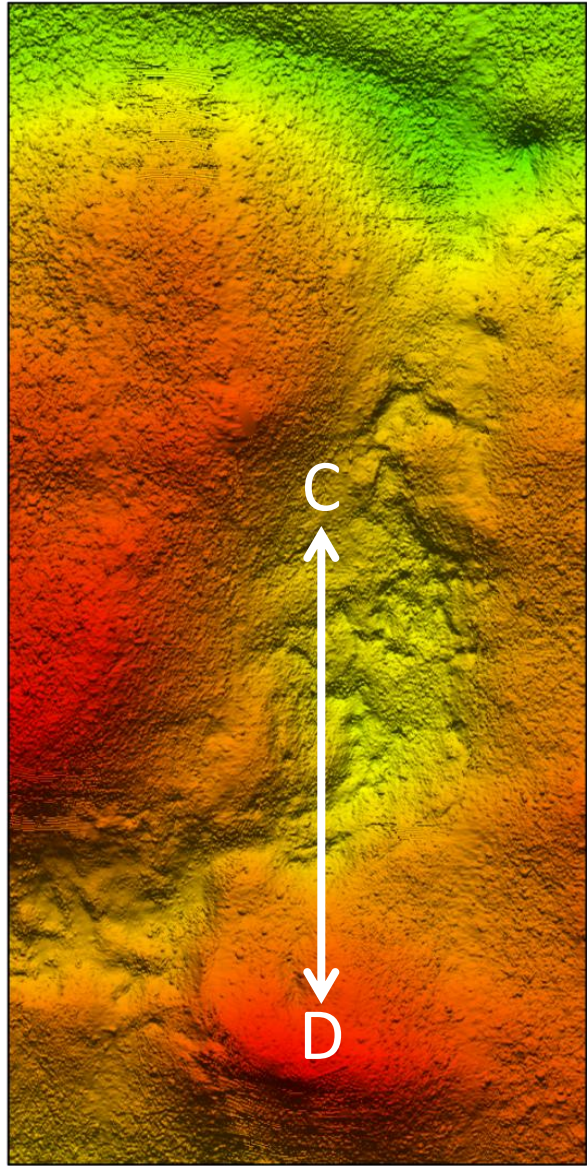
# Result for MBES Survey



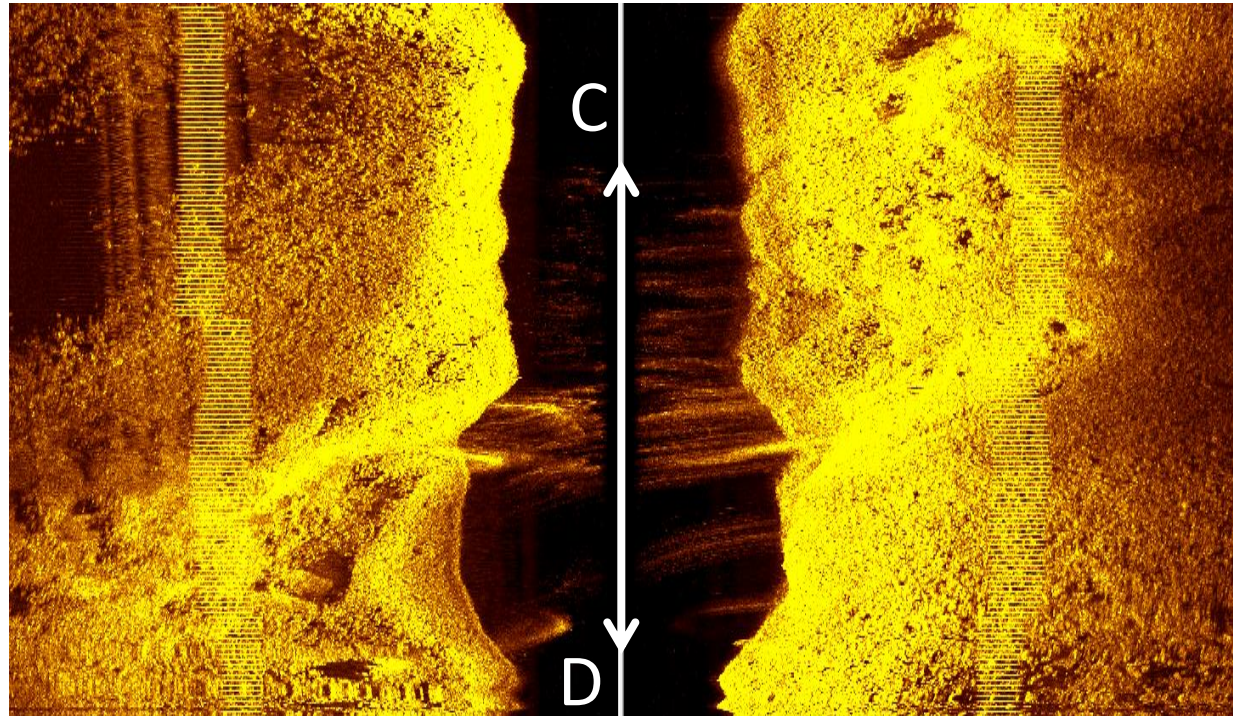
# Side Scan Image (1/2)



# Side Scan Image (2/2)

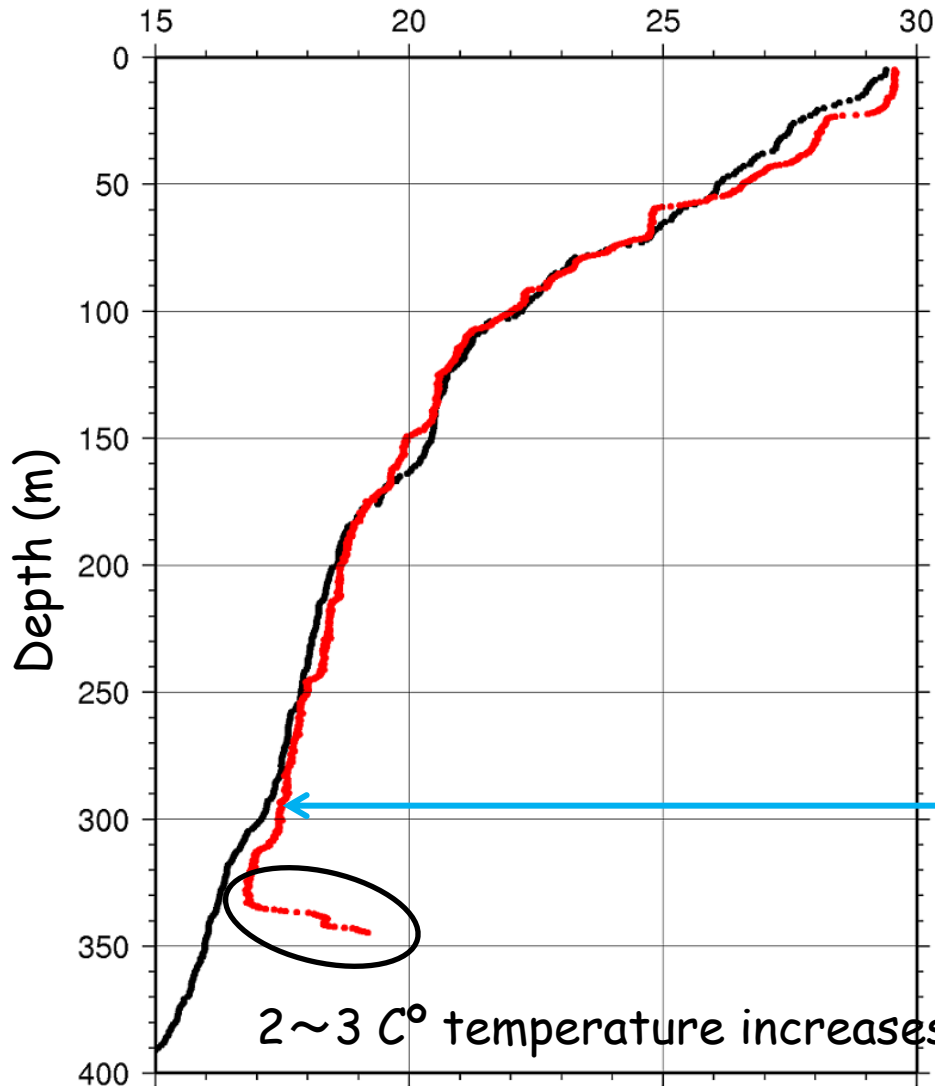


550 500 450 400 350 300 250  
Depth (m)



# Water Temperature Profile

Temperature (C°)



- XBT Cast at Amami-Daiichi-Knoll
- XCTD Cast at 8 km away from Amami-Daiichi-Knoll

*AUV Gondou* showed no temperature increase at altitude 40~50 m above the seafloor

2~3 C° temperature increases near the seafloor !!

# GEBCO in the future

Ancient GEBCO

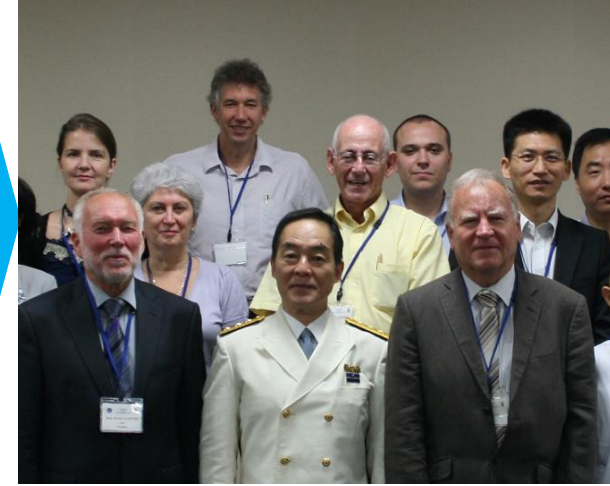


Current GEBCO



Based on Smith & Sandwell,  
and MBES surveys

GEBCO in the future



Super high-res. grid  
based on AUV surveys

