



THE UNITED KINGDOM  
HYDROGRAPHIC OFFICE

# International Press & Media Briefing

Wednesday 9 February 2005



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# Welcome to The United Kingdom Hydrographic Office

**Dr Wyn Williams**  
**CE UKHO**



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# Introduction

**Captain Ian Turner RN**  
**Hydrographer of the Navy**



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# HMS SCOTT

Hydrographic Instruction 1123

**BAY OF BENGAL**

**EARTHQUAKE RUPTURE ZONE**



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# HMS SCOTT

Hydrographic Survey Vessel

**Commander Steve Malcolm RN**  
**Commanding Officer**



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# Outline Plan

- **Why did we need the survey?**
- **Why this ship?**
- **Capability – Equipment and People**
- **Operational Environment**
- **Co-operation**
- **Survey Results**
- **What next?**
- **Questions and Panel Discussion**





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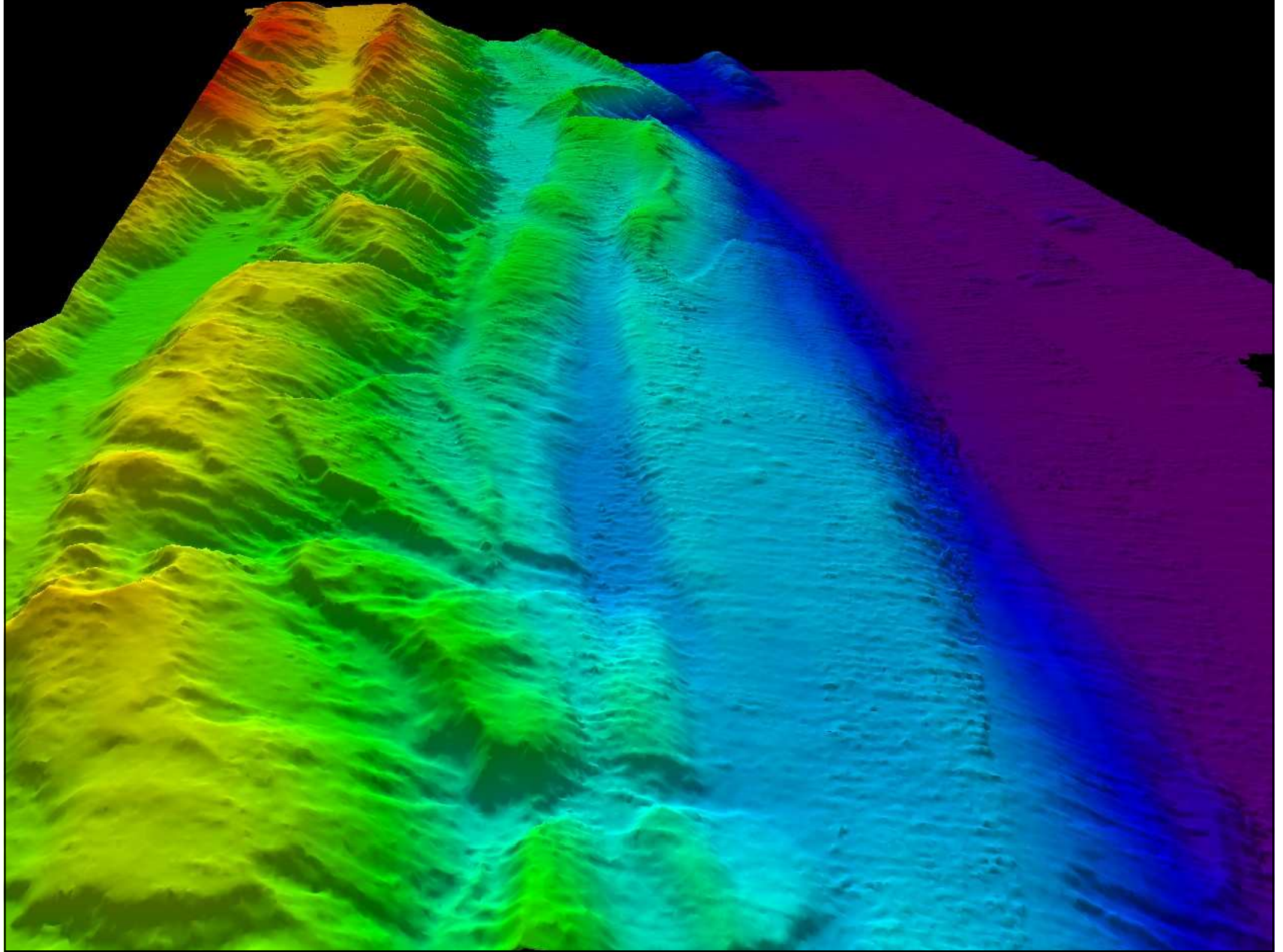
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# Why did we need the survey?

Existing Chart Data



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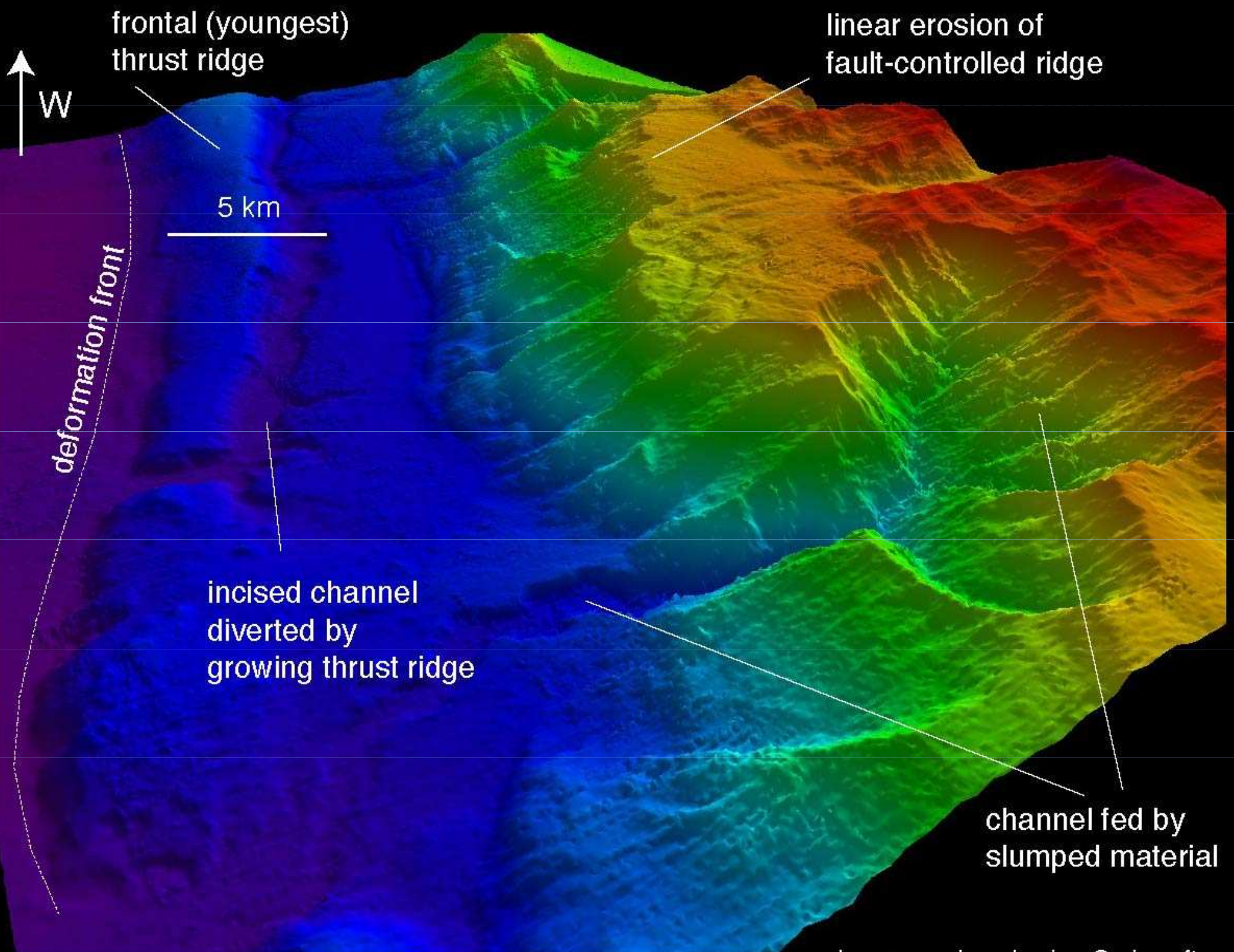


Image produced using Caris software



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# Why HMS SCOTT?

## Equipment and Capability



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# Why HMS SCOTT?

## Personnel



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41	030/1500	030/1500	AL
42	030/1500	030/1500	AL
43	030/1500	030/1500	AL
44	030/1500	030/1500	AL
45	030/1500	030/1500	AL
46	030/1500	030/1500	AL
47	030/1500	030/1500	AL
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50	030/1500	030/1500	AL
51	030/1500	030/1500	AL
52	030/1500	030/1500	AL
53	030/1500	030/1500	AL



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# Co-operation



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- **Government Agencies (FCO, MoD)**
- **Military, Scientific and Academic institutions (RN, BGS and SOC)**
- **Indonesian authorities**





# Results



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- **Background to the December 26 earthquake**
  - **Plate tectonic setting and structure of subduction zones**
  - **Seismology**
  - **Tsunami generation and observations**
- **General survey plan, area covered and overview of results so far**
- **Active tectonic features**
- **Active erosion/sedimentary features**

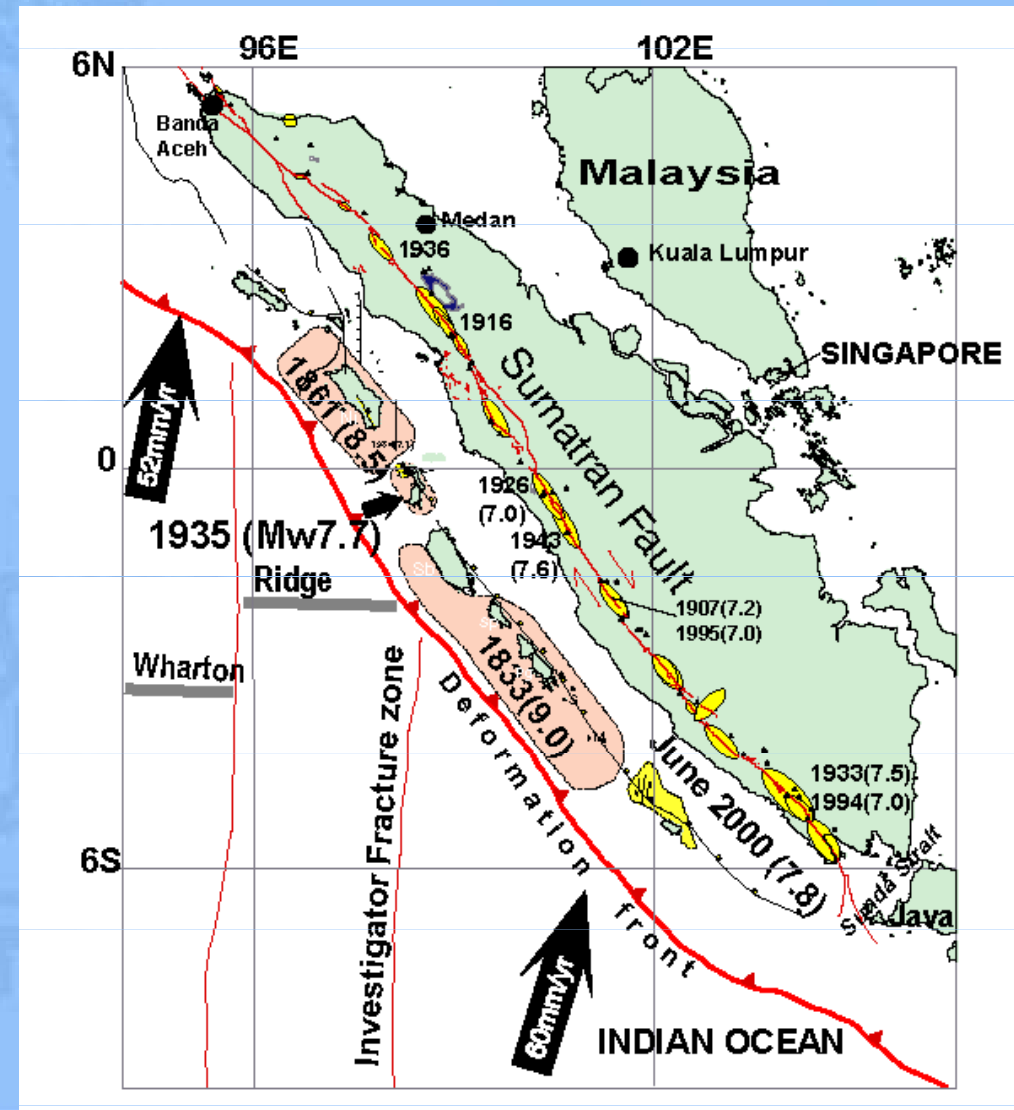


# Why did it happen?



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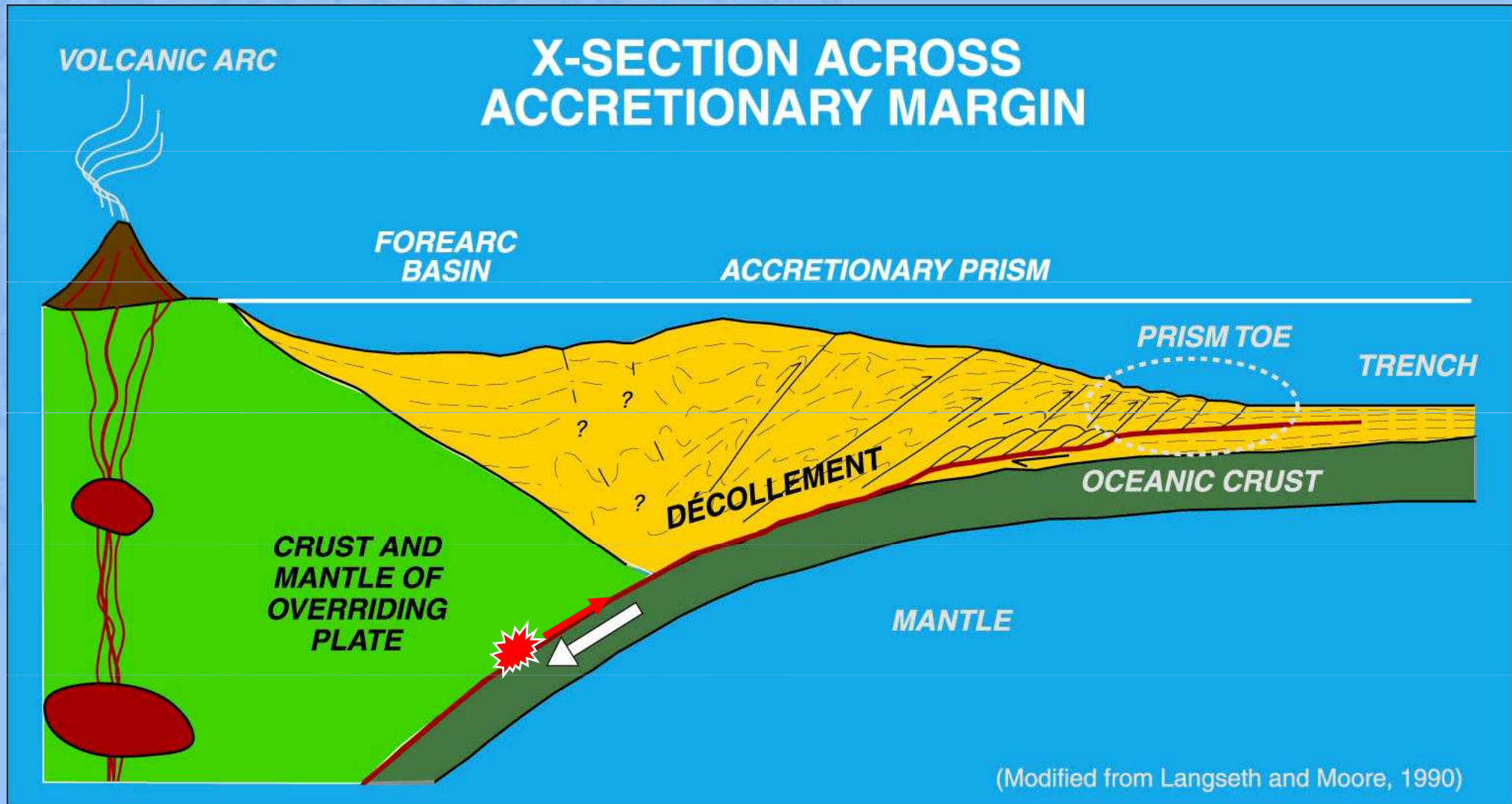
- Indian plate is being subducted beneath Eurasia / Burma plate
- Rate 50-60mm/yr but very oblique
- Two large earthquakes during C19<sup>th</sup> further to south (Figure from studies by Kerry Sieh, CalTech)



# Generic subduction zone cross section



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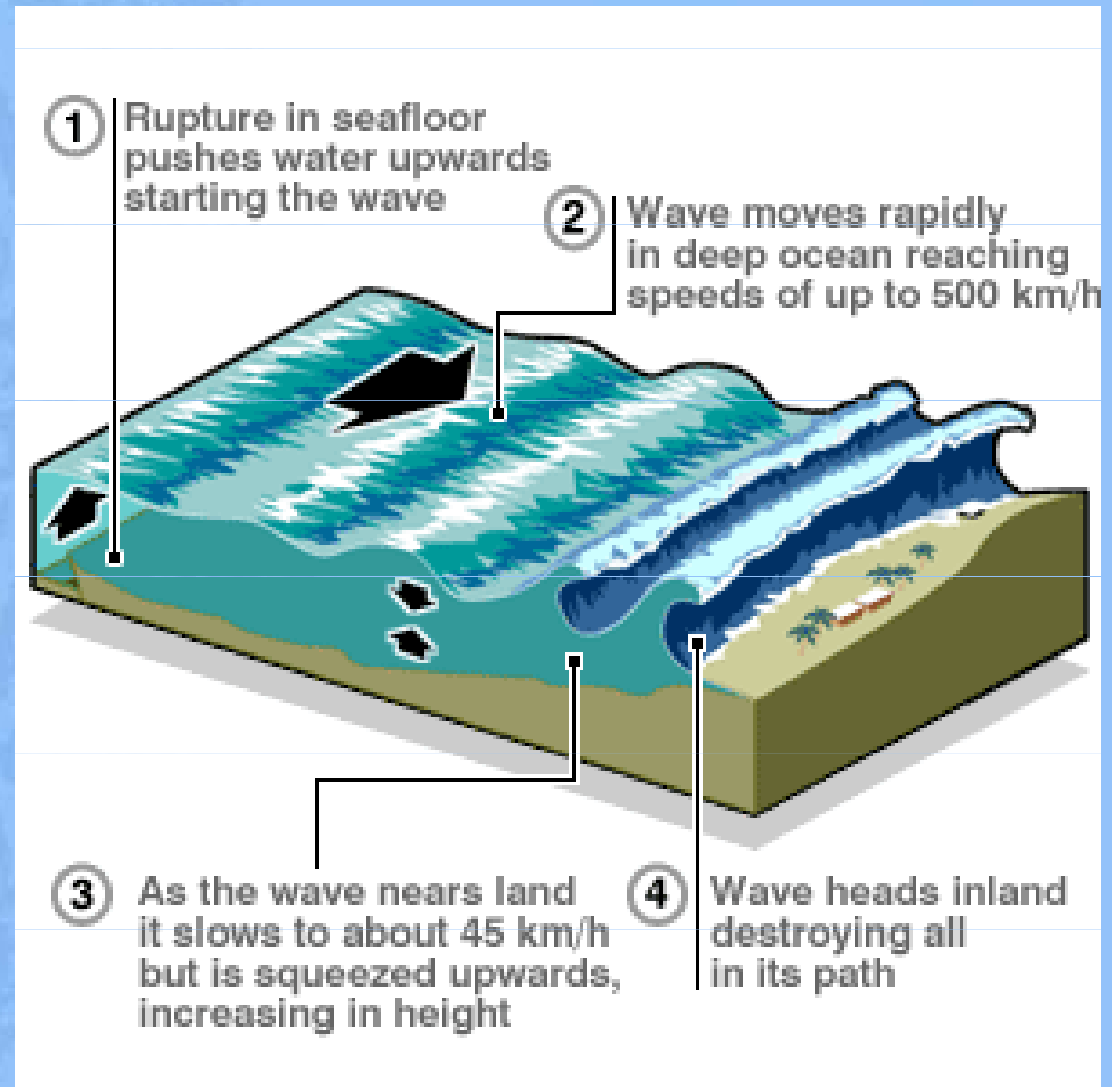


# Earthquake-generated tsunamis



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- Seafloor deformed by earthquake
- Wave initiated with small amplitude and high speed in deep water
- Speed decreases and amplitude increases in shallow water



# Survey Area



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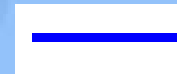
Position of maximum movement



Position of Epicentre



TTW BASELINE



Secondary Survey Area from HI



Primary Survey Area from HI

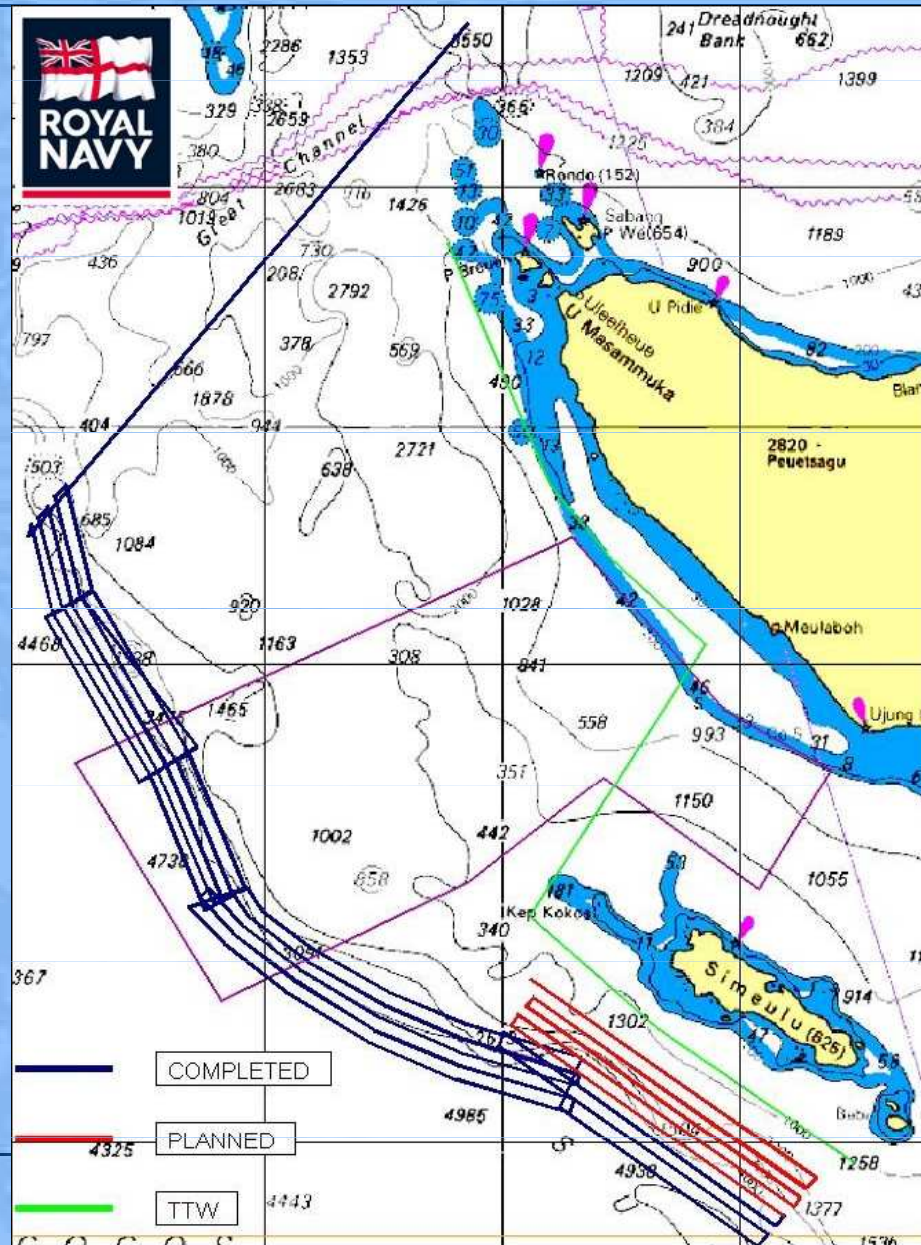




# Lines Run



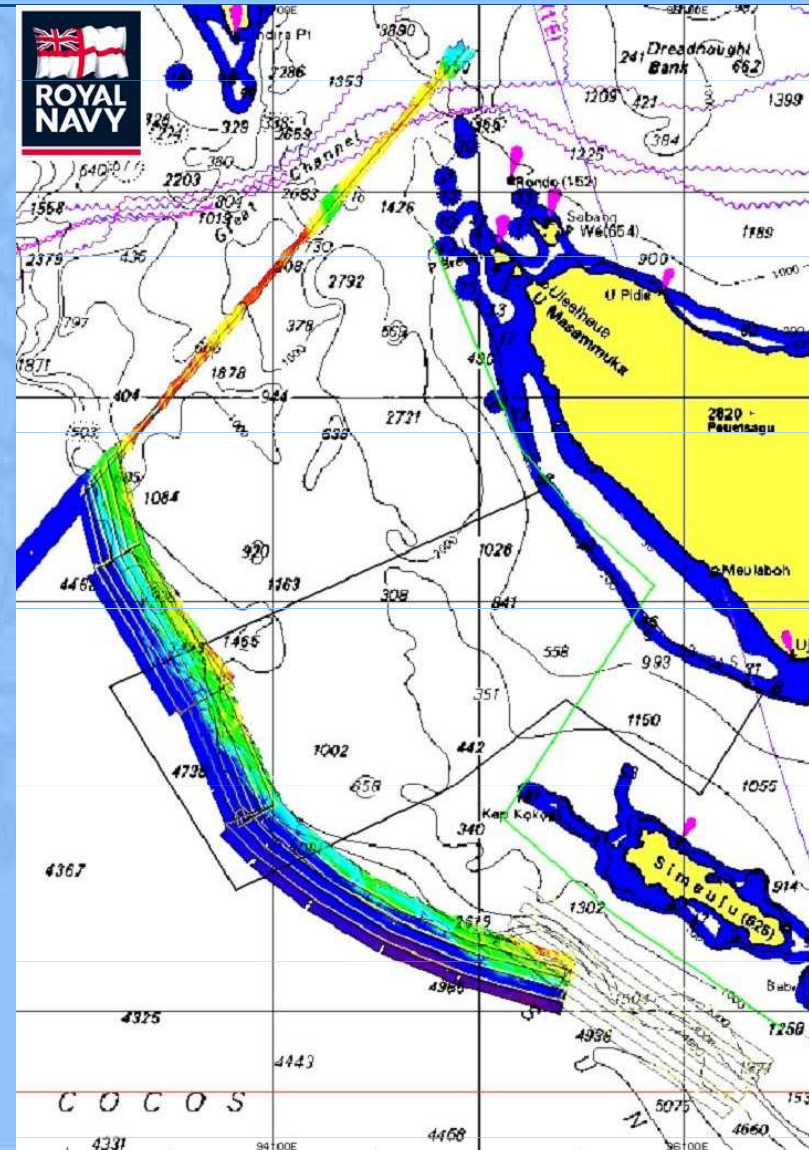
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# OVERLAY OF DATA COLLECTED AND CURRENT CHART



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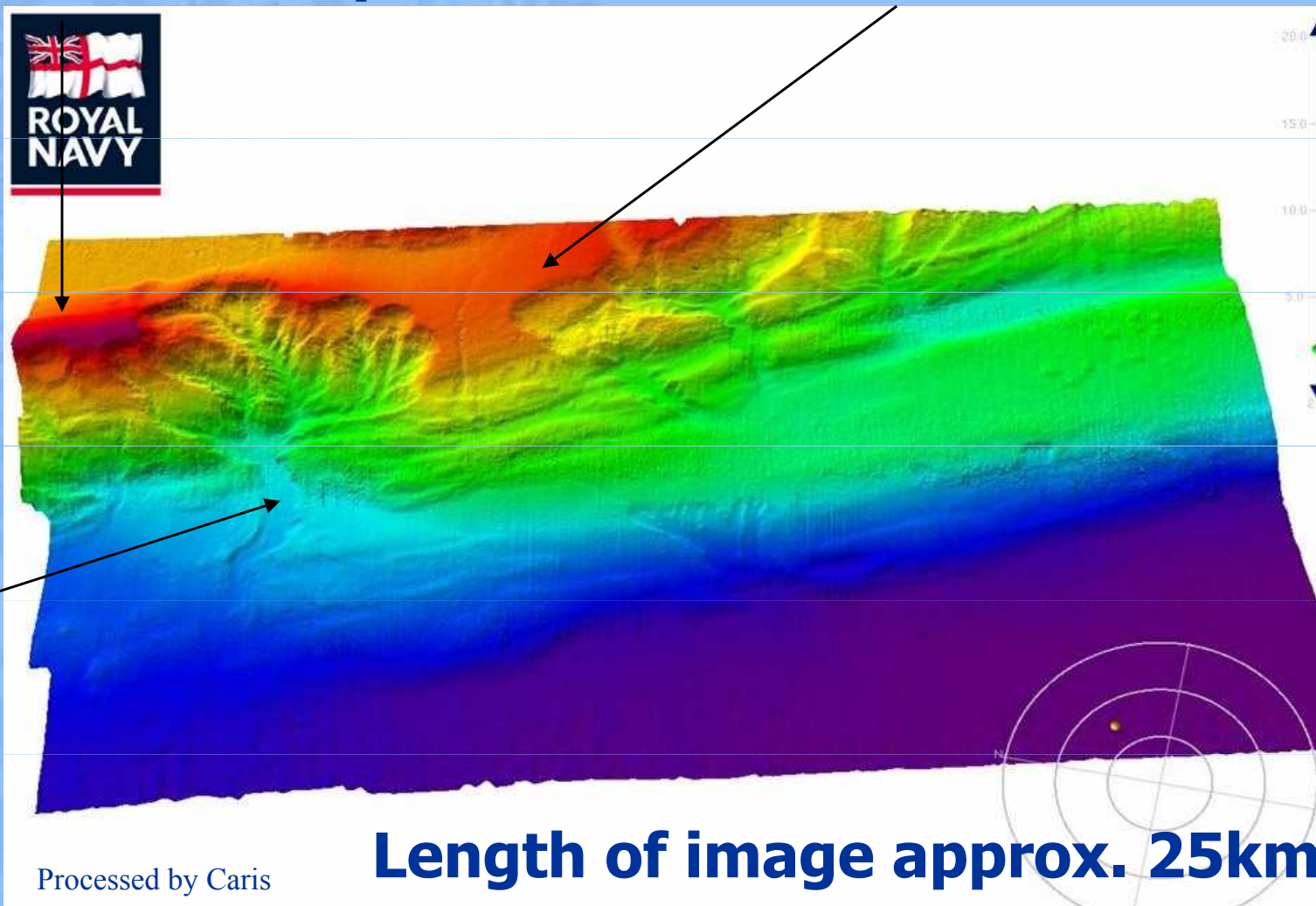
# Examples of Landslide Scars



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## Slide Scar Complex

## Slide Scar



**Canyon  
leading  
on to  
abyssal  
plain**

Processed by Caris

**Length of image approx. 25km**



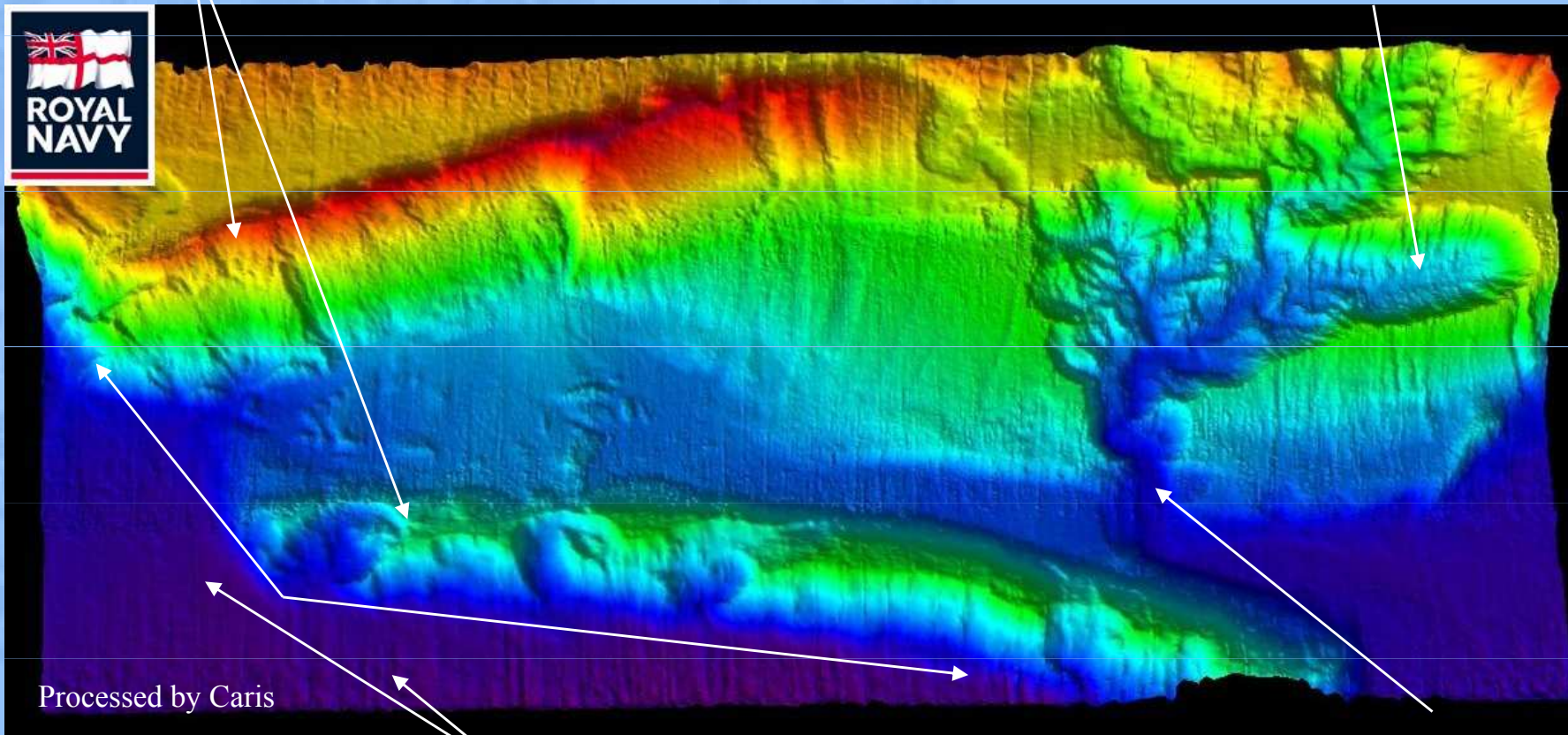
# Slide Scars and Thrust Faults



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**Ridges from thrust faulting**

**Slide scar propagating southwards**



**Plate boundary**

**(Approx. 40km across)**

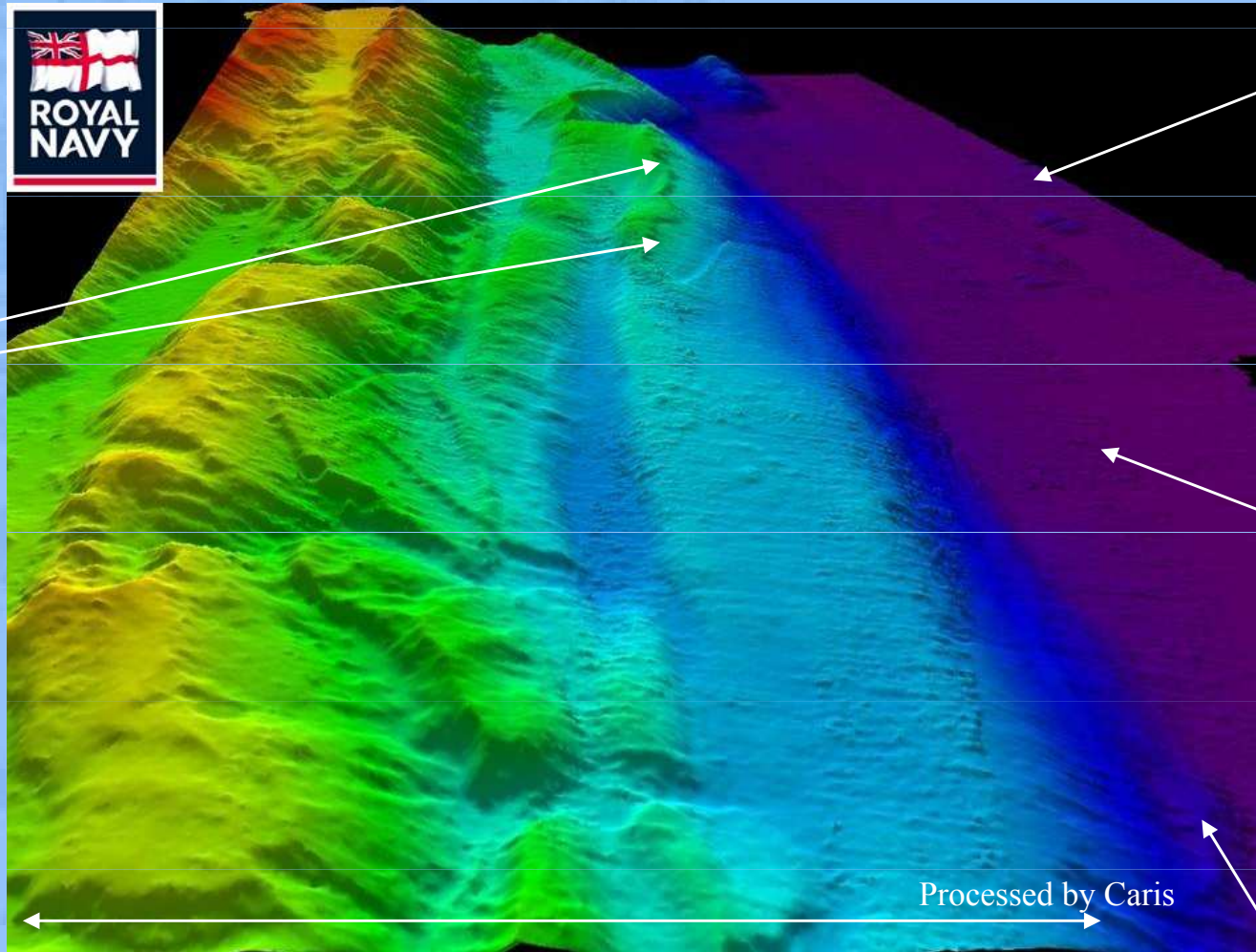
**Canyon**



# Plate Boundary



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**Evidence  
of slope  
failure**

**Slide  
Blocks**

**Abyssal  
Plain**

**Accretionary wedge**

**Plate Boundary**



# Youthful Slide with Slide Blocks

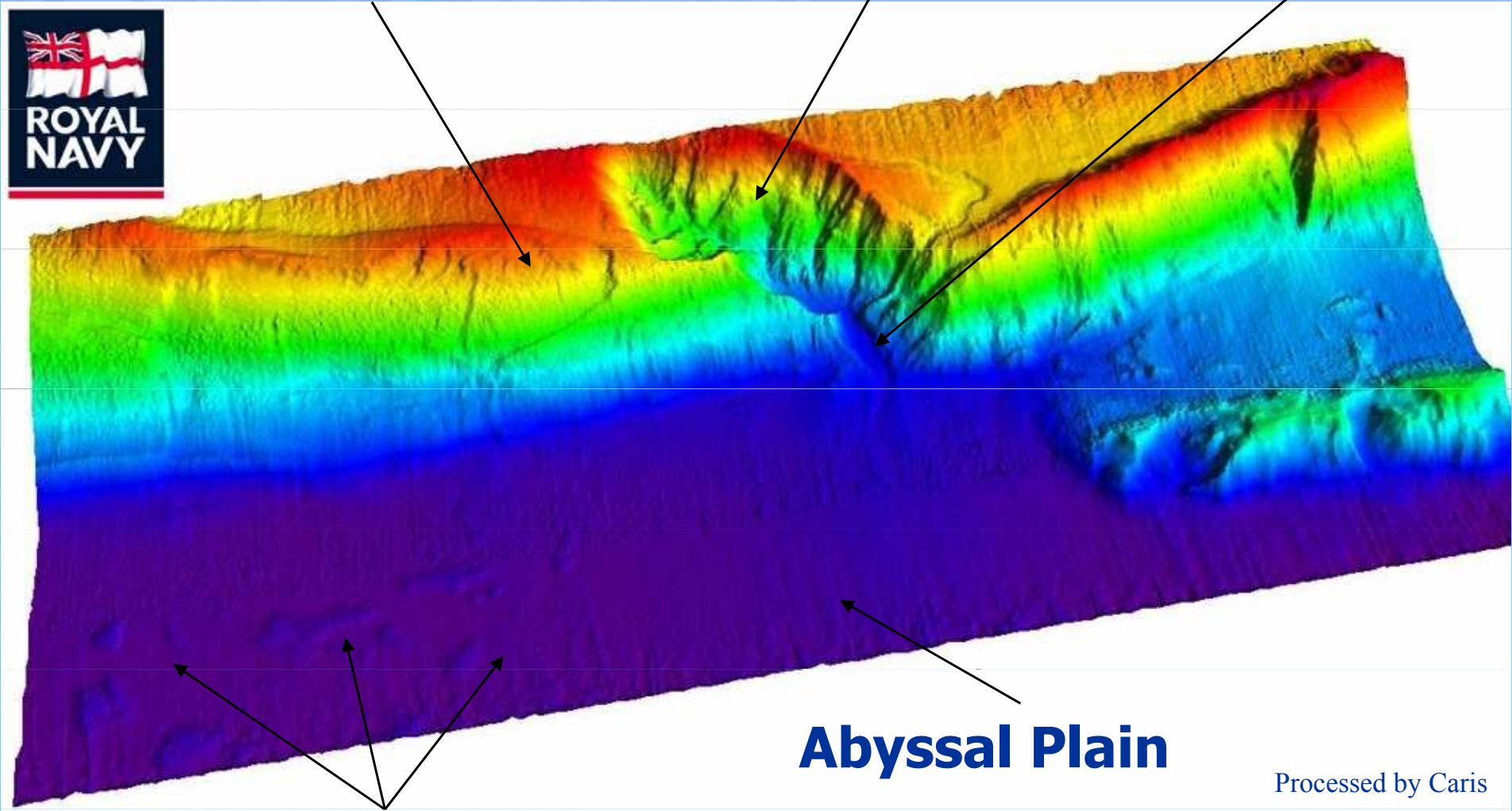


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**Youthful Slide Scar**

**Slide Scar**

**Canyon**



**Abyssal Plain**

Processed by Caris



**Slide Blocks**

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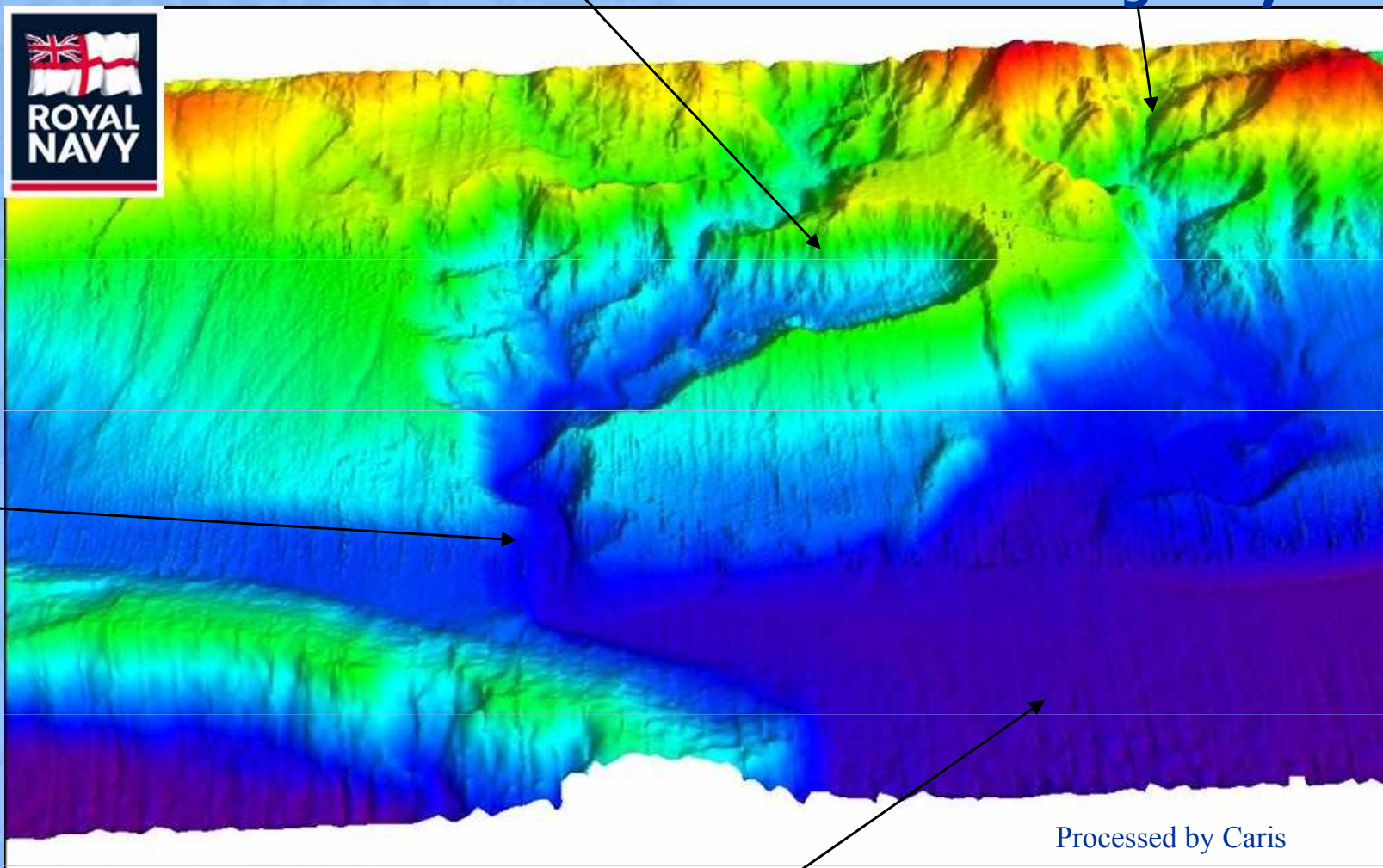
# Example of Slide Scar



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Slide Scar

Mature slide scar area  
with cross cutting canyons



Canyon

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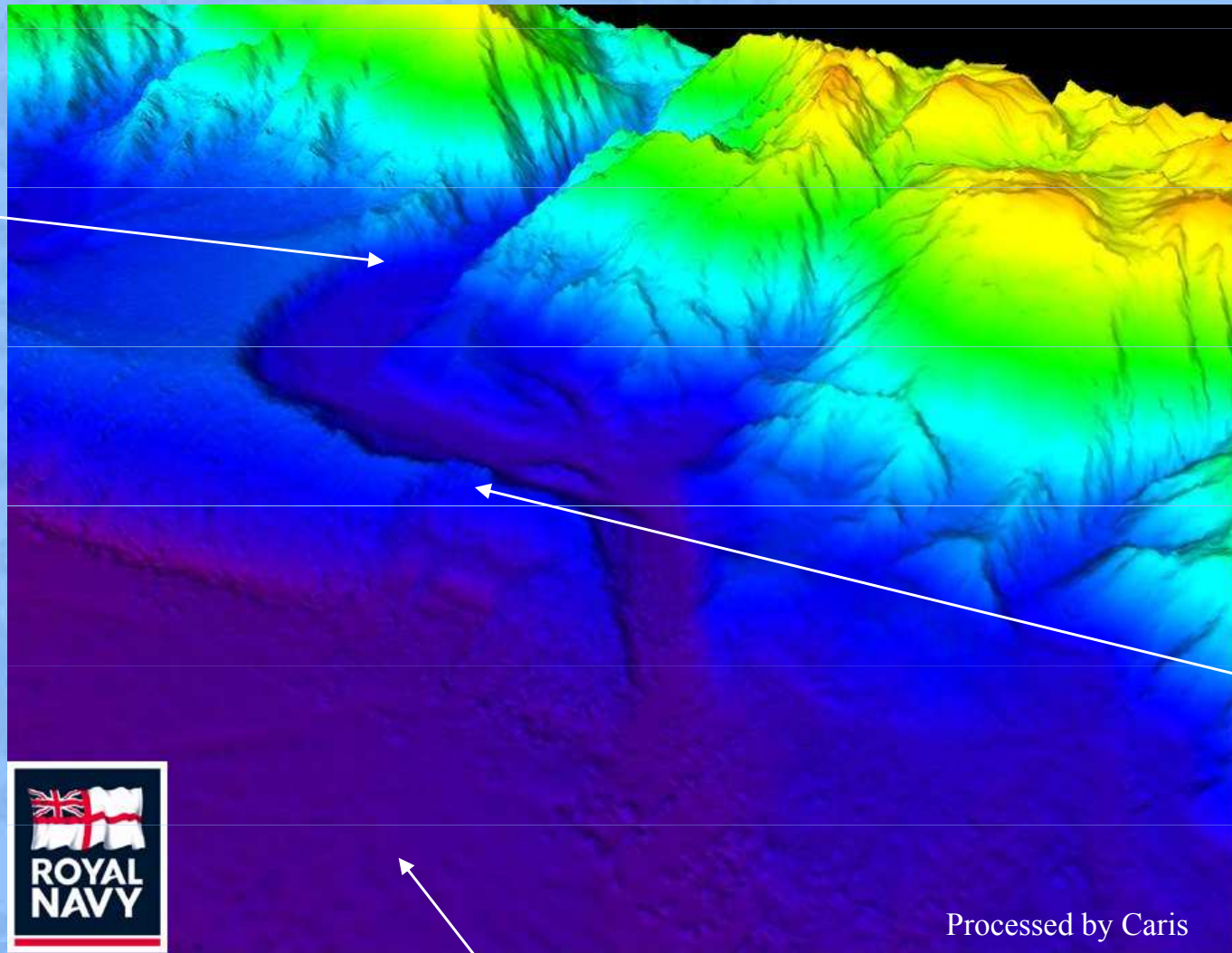


**Abyssal Plain** © British Crown Copyright 2005



# Diversion of Canyon

Canyon



Ridge  
causing  
diversion  
of  
canyon  
as it is  
forced  
upwards



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Abyssal Plain



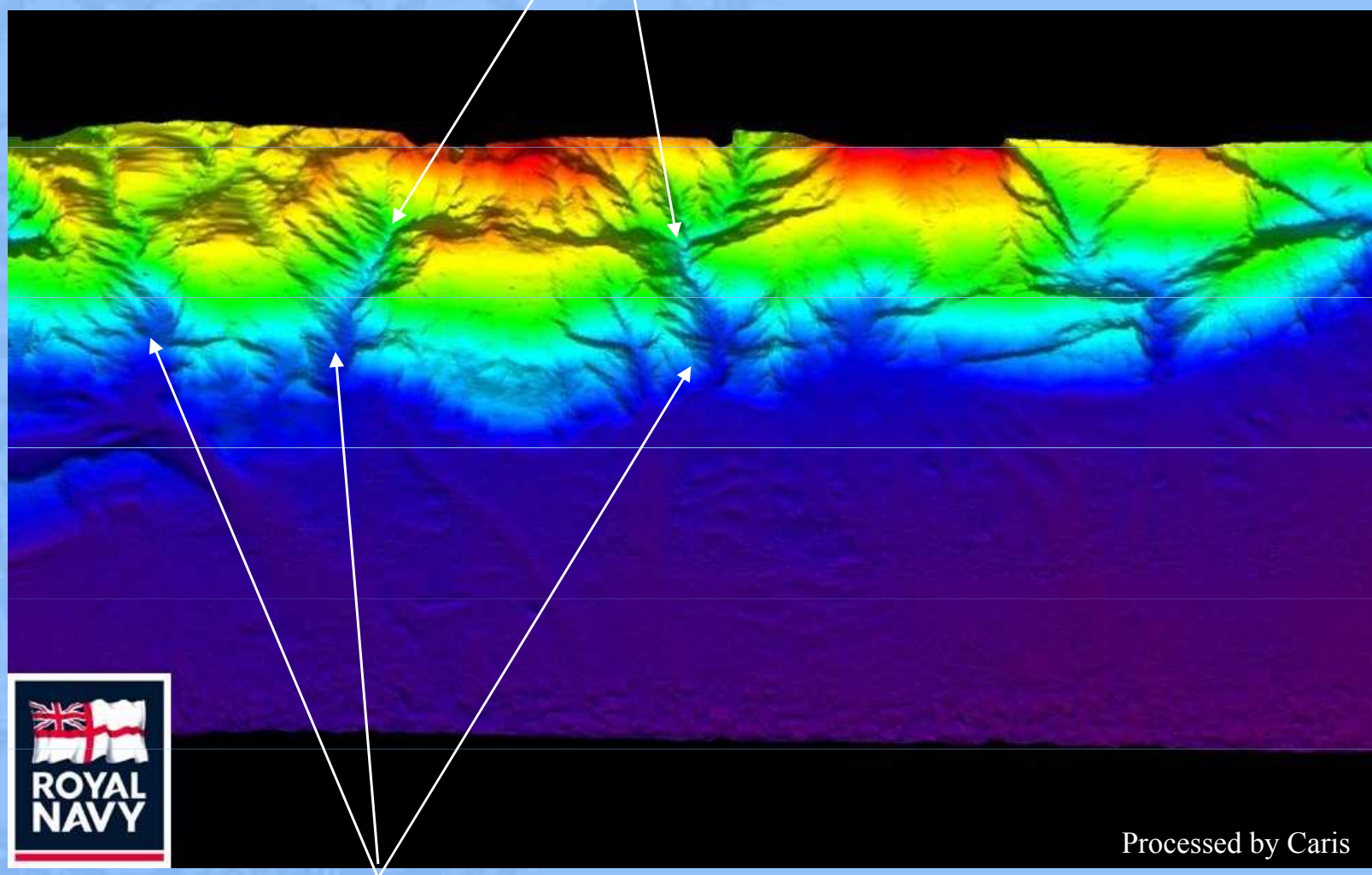




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# Area of Active Erosion

**Slide scars**



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**Canyons**



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# Older slide on newer ridge



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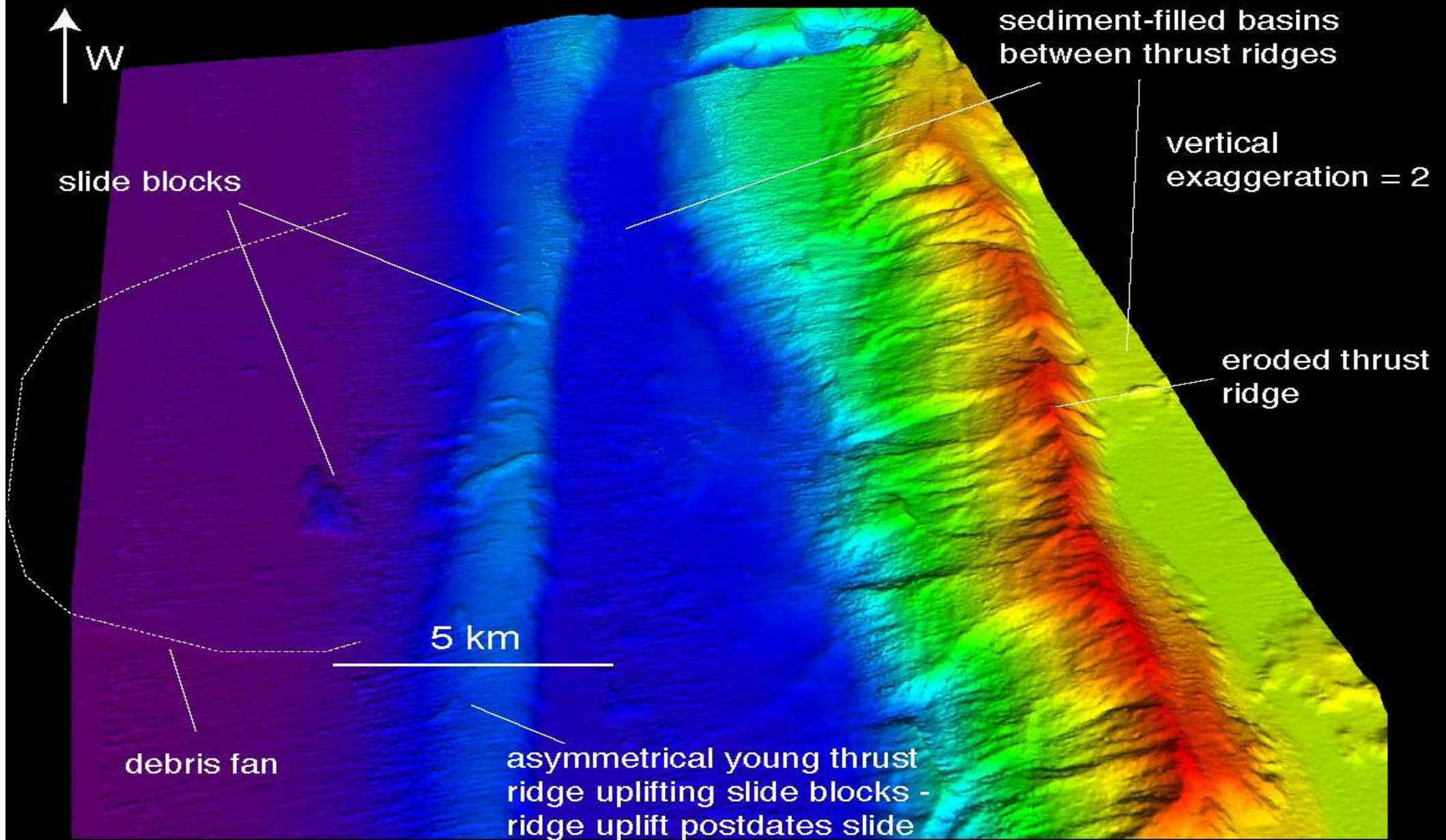
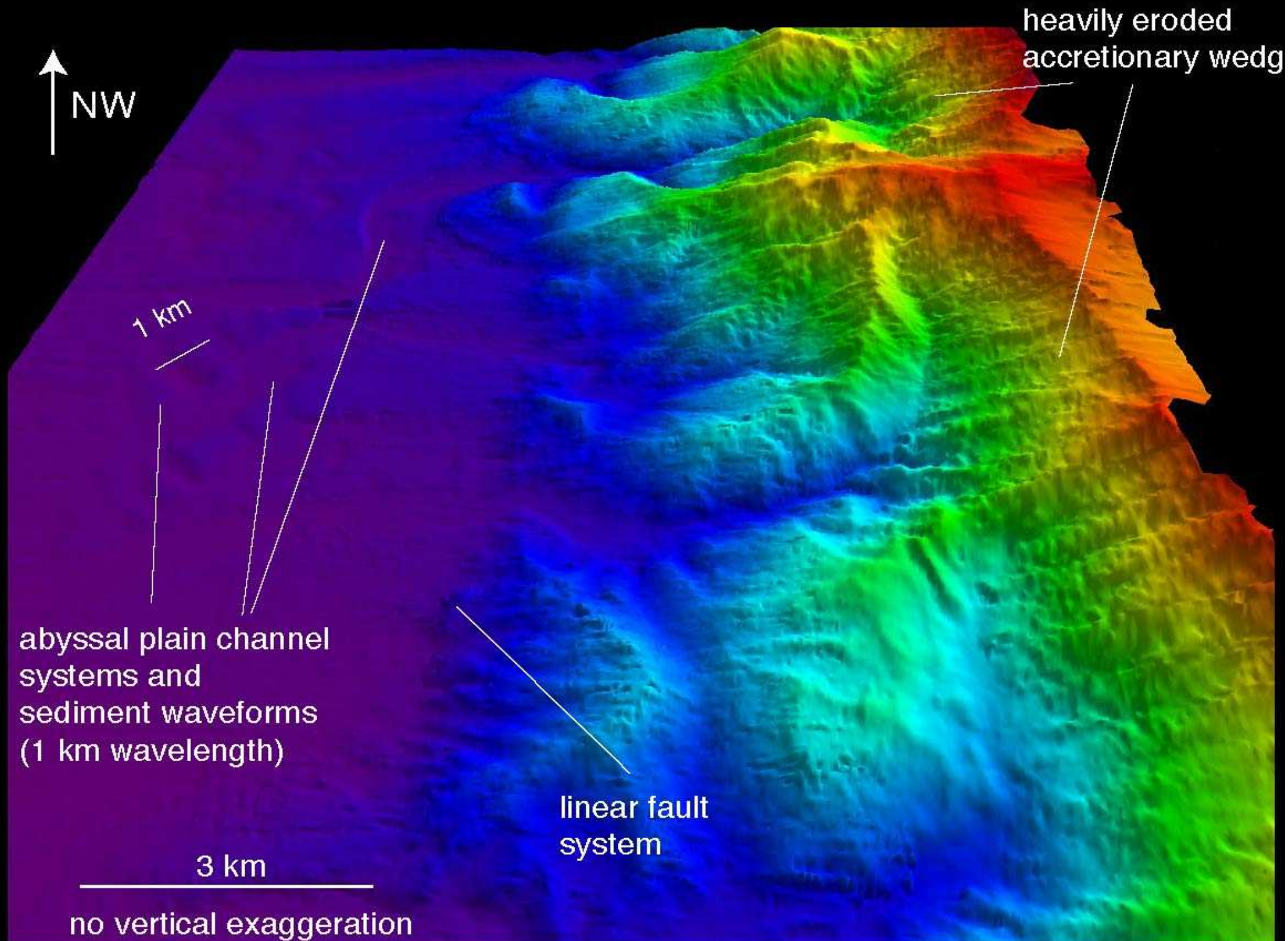


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Thank you

Questions?



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**ROYAL  
NAVY**



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