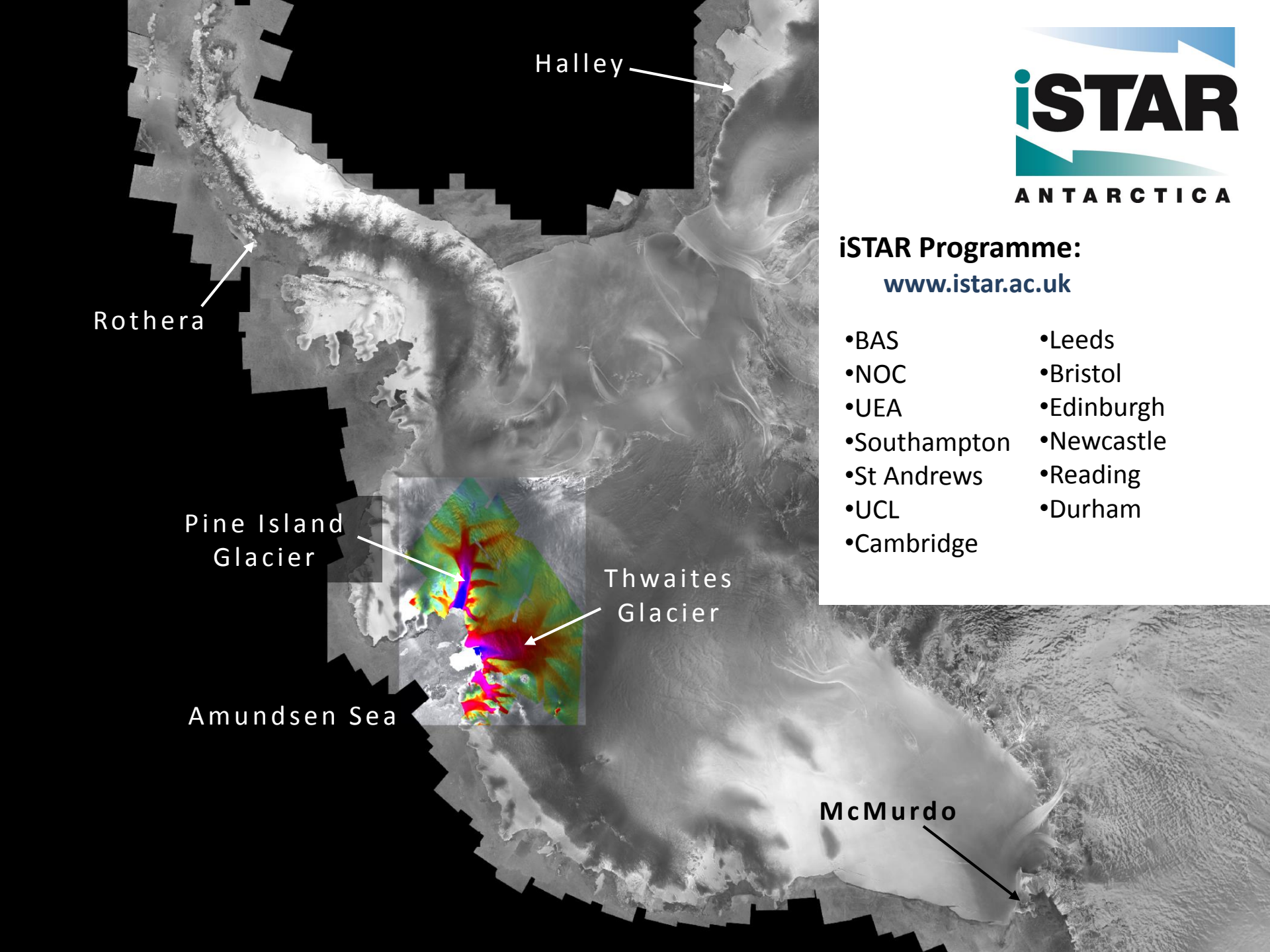
iSTAR: UK ice sheet traverse across Pine Island Glacier drainage basin

Andy Smith
British Antarctic Survey

- Support major field science effort in remote area
- New way of doing fieldwork in Antarctica
- Operations - Doing science

British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

NERC SCIENCE OF THE ENVIRONMENT

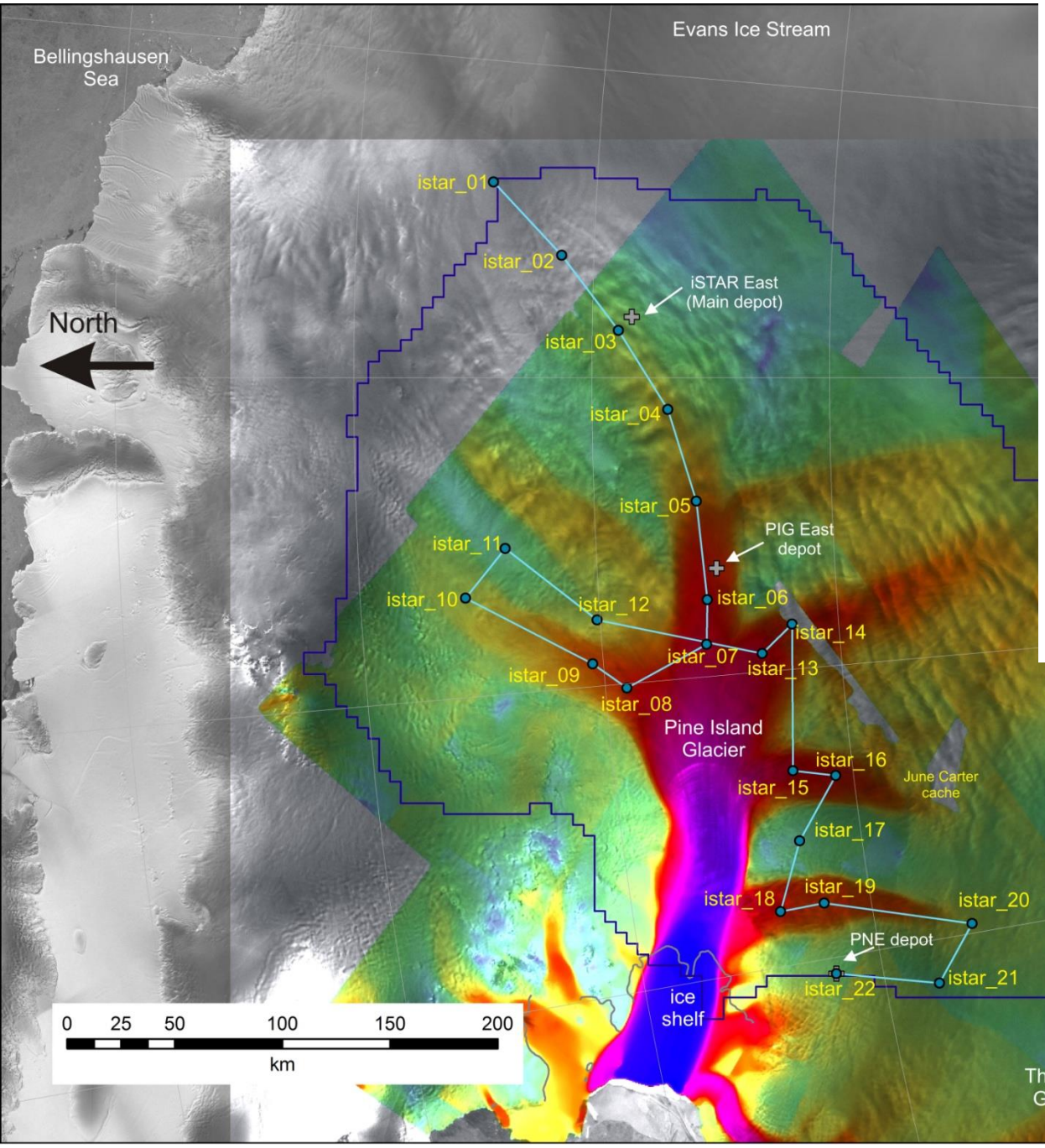


iSTAR ANTARCTICA

iSTAR Programme:

www.istar.ac.uk

- BAS
- NOC
- UEA
- Southampton
- St Andrews
- UCL
- Cambridge
- Leeds
- Bristol
- Edinburgh
- Newcastle
- Reading
- Durham



iSTAR ANTARCTICA

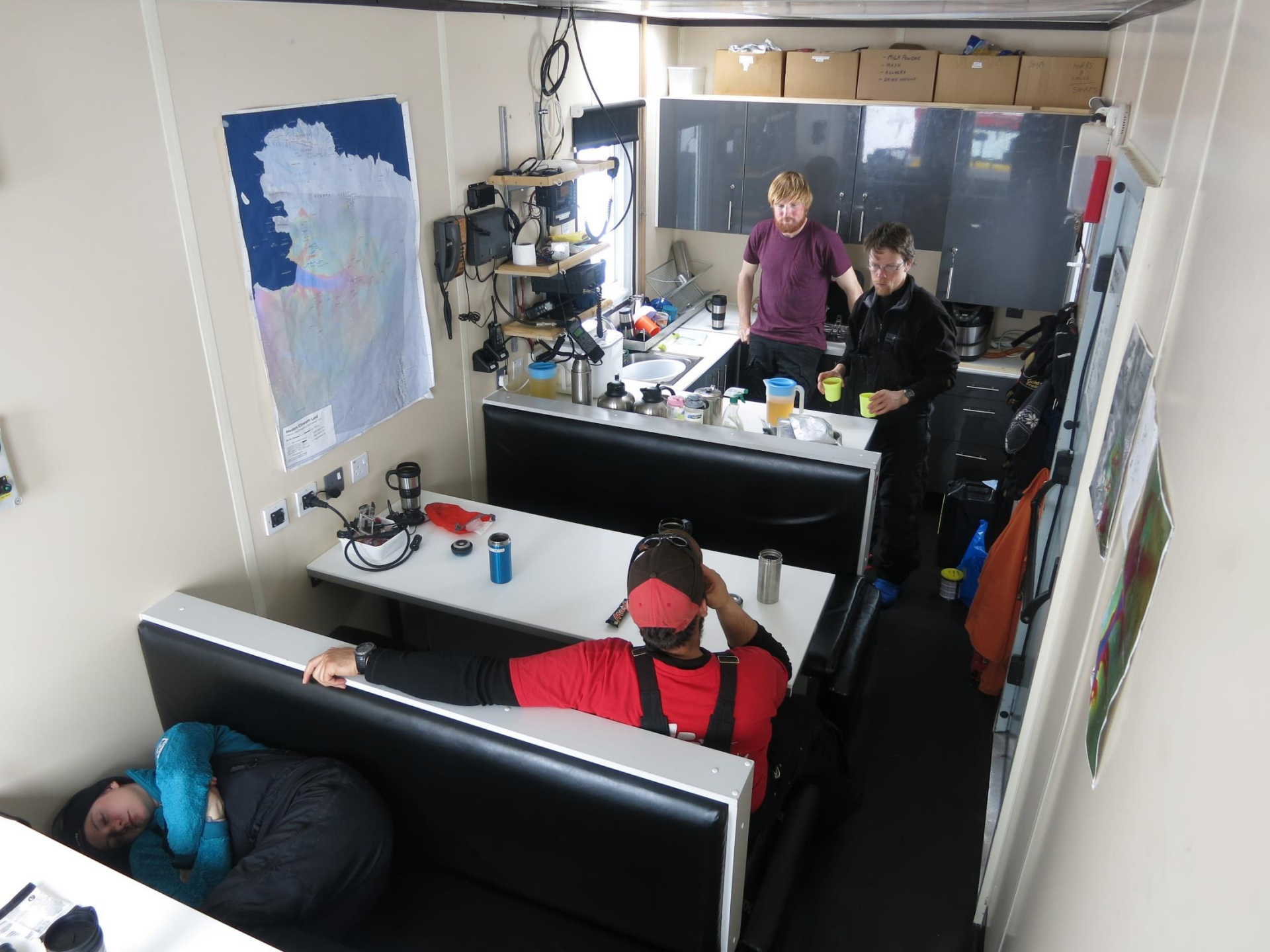
iSTAR traverse:

- 900 km route
- 12 people (BAS, Leeds, Reading, Edinburgh, Bristol)
- 9 scientists, 3 support
- Experiments *en-route* and at sites

iSTAR traverse team, Christmas 2013, Pine Island Glacier “PIG”


POLAR
PistenBully
300
POLAR


British Antarctic Survey
HONDA
PistenBully



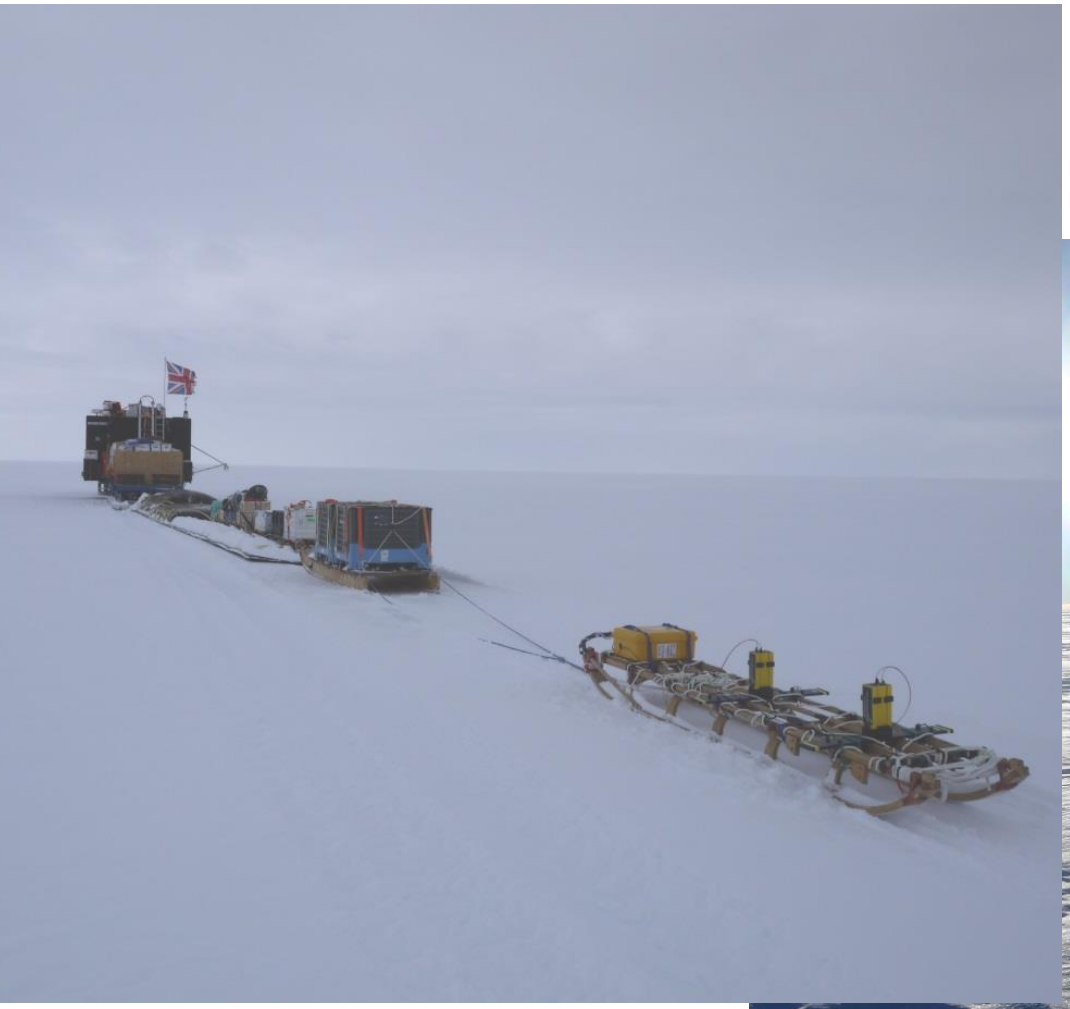

iSTAR traverse camp from the air

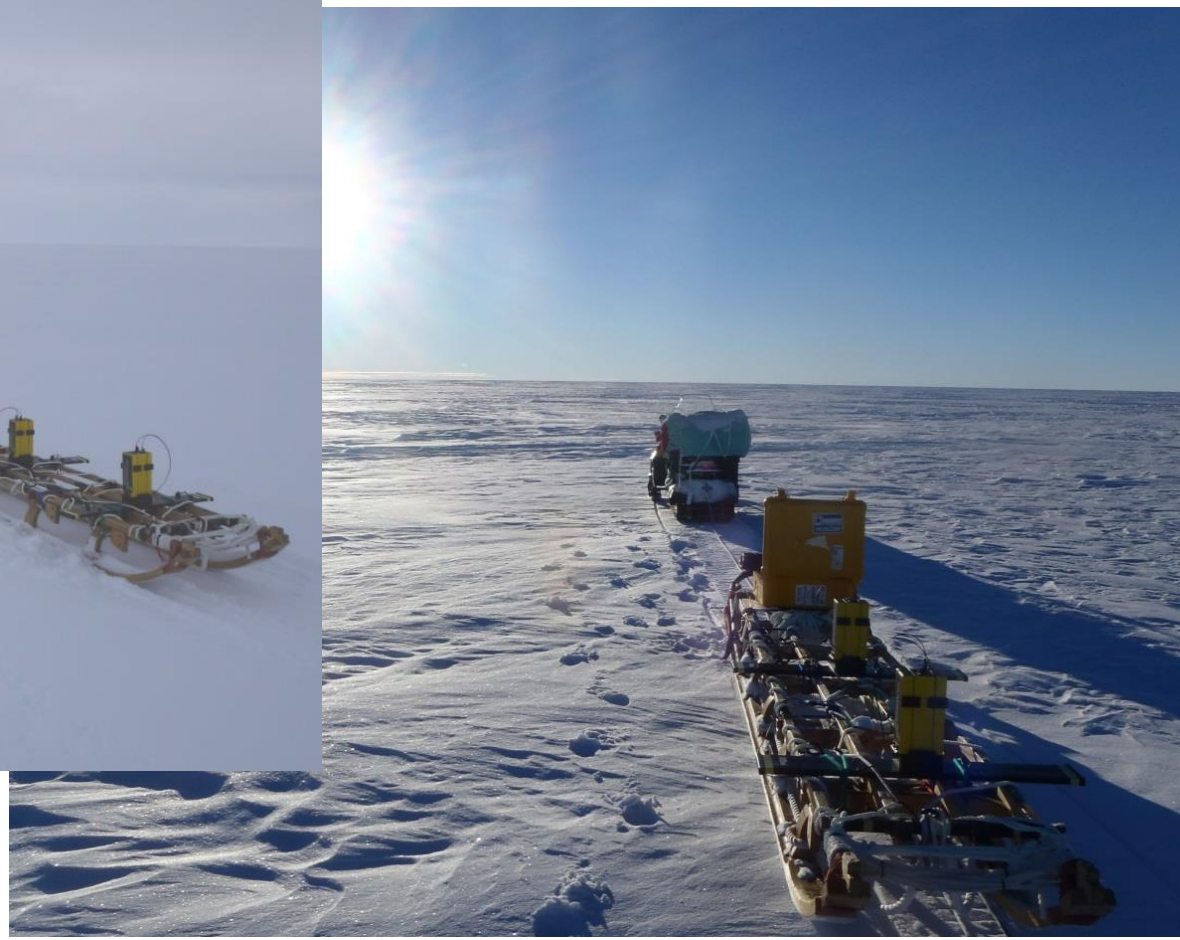
Deep radar

Subglacial landscape

Shallow radar (GPR)

Snow accumulation variability





Shallow radar (“pRES”)

Snow accumulation variability

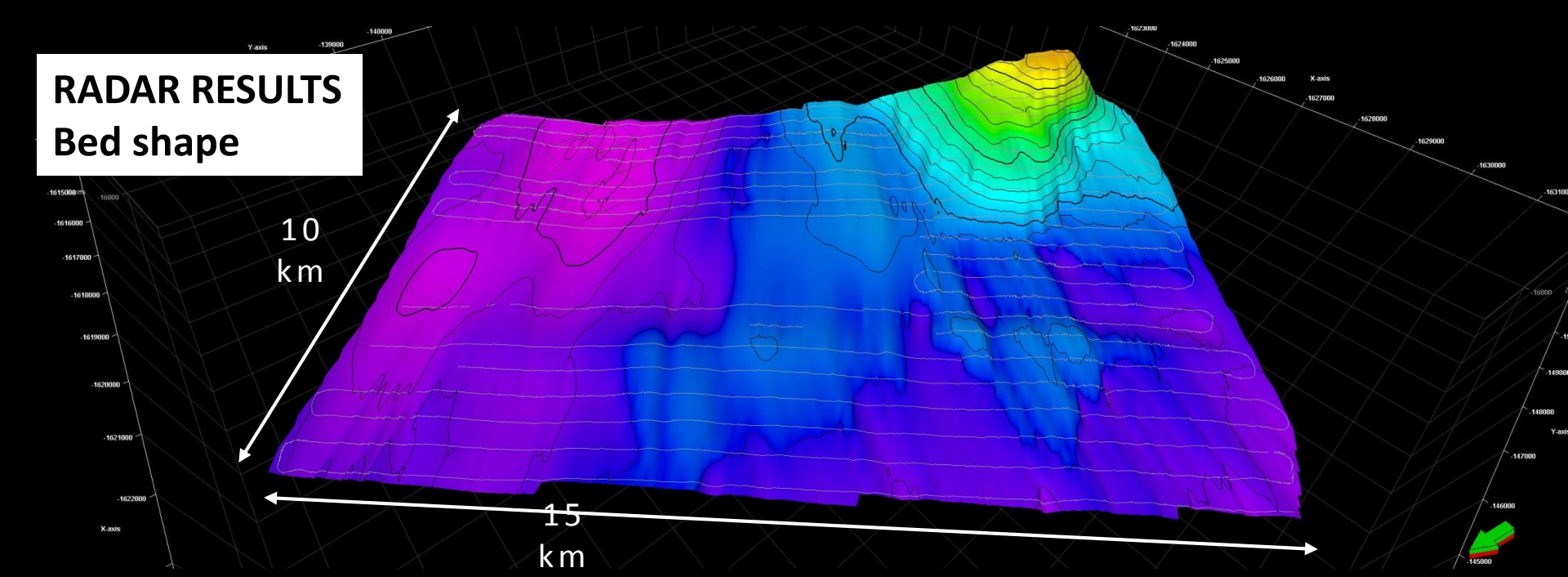
“Neutron Scattering” measurements of snow density

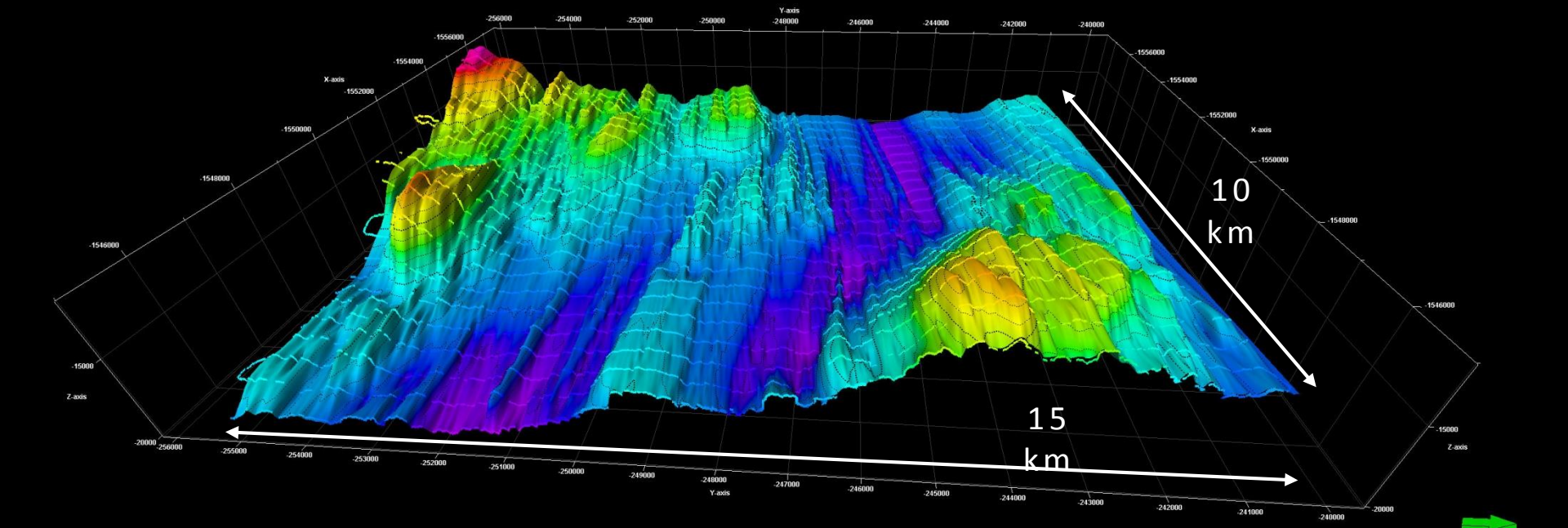

ROTHERA
ROTHERA


ROTHERA
Zone 2
RD13-83

Ice flow measurements

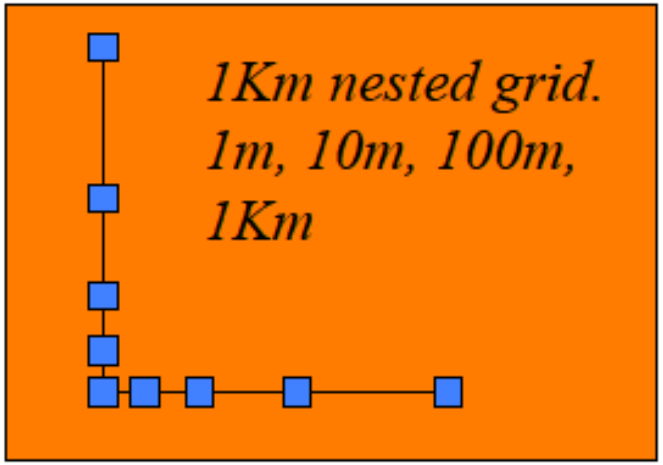
RADAR RESULTS
Bed shape

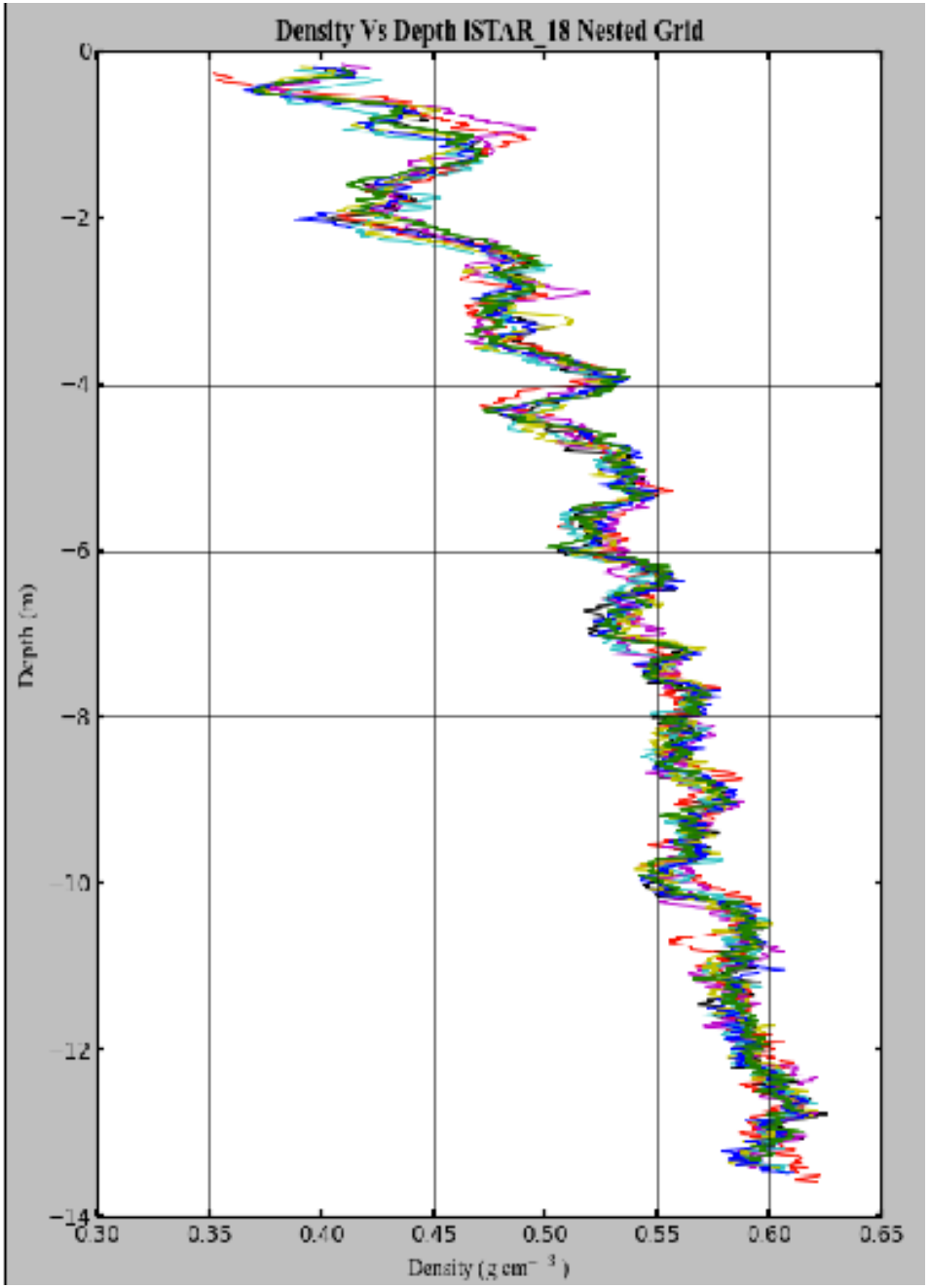




Data obtained

- 68 Profiles obtained across 22 sites
- Five 1km nested grids
- One 100m nested grid
- GPS measurements of lat, long, elevation +-5cm accuracy
- New access holes iSTAR02, 05






PistenBully

iSTAR Traverse, Summary of Achievements

- Route length: 900km
- 12 people (9 scientists, 3 support staff), 2 months
- Deep radar: >2000 km
- Shallow radar (GPR): 950 km
- Shallow radar (pRES): 900 km
- 68 Neutron Probe holes logged
- 11 over-winter GPS stations installed

Could not have achieved this in 2 months without traverse technology

iSTAR ANTARCTICA

Future for the traverse capability? What's next?

- iSTAR is only half-way there!
- Second traverse next season

- Ronne & Filchner ice shelves
- UK POLENET (seismic, PIG area)
- BEAMISH (Rutford Ice Stream)

... and then ...?


Thank you