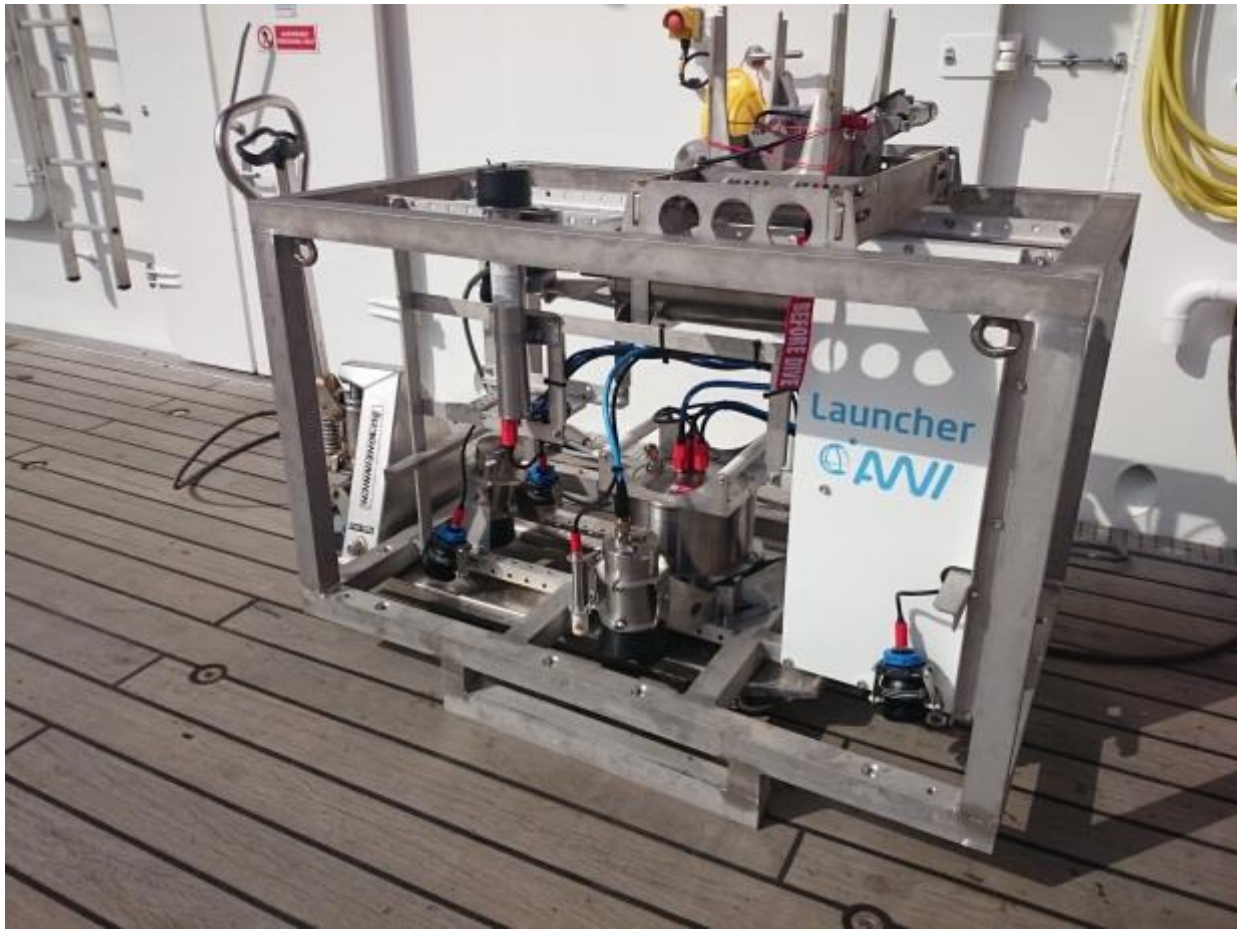
DISCOL AWI OFOS Launcher habitat mapping
(AWI OFOS team SO242/2 with aid from SO242/1! Thanks!)

In addition to collecting image data for the biodiversity megafauna analysis (see Pedro presentation for WP2), images collected by the AWI Ocean Floor Observatory System (OFOS) Launcher also allow the mapping and quantification of sub-habitat types across DISCOL.

OFOS is a camera system towed by the ship at a height of approx. 1.5 m.

This quantification will allow the upscaling of the biogeochemical investigations of seafloor / sediment processes to the regional scale.



DISCOL habitat mapping comparison data

OFOS not the only mapping option….Repeated cruises employing various seafloor imaging and mapping techniques have surveyed the DISCOL region over the last 26 years.

- Various Ocean Floor Observation Systems (OFOS), with different deployment heights and camera arrangements
- Ship mounted sidescan and backscatter imaging systems
- Autonomous Underwater Vehicle (AUV) mounted acoustic systems
- AUV mounted imaging systems – flying at various heights in the water column
- Remote Operated Vehicle (ROV) camera systems
- Crawlers and lander systems

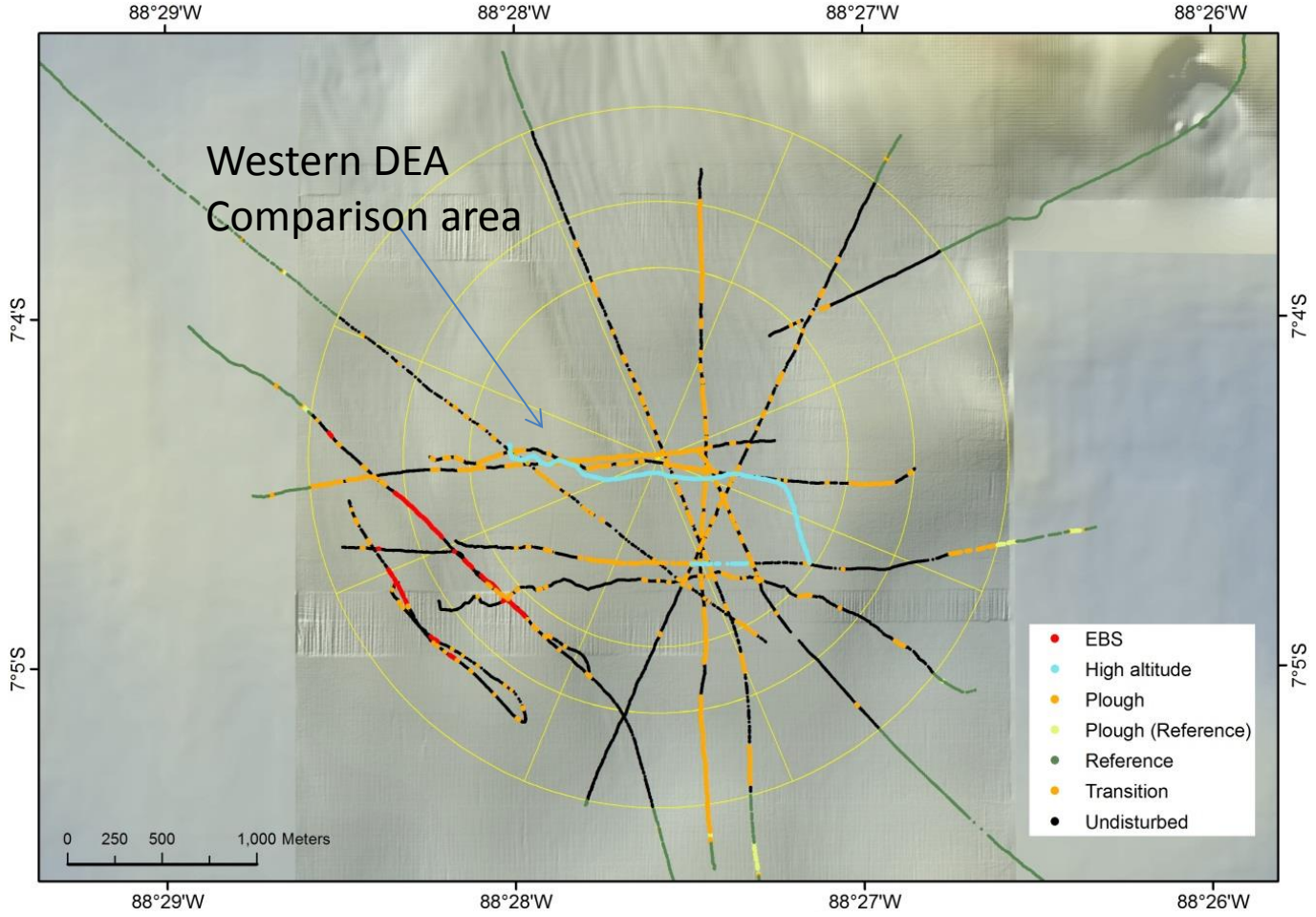
Are results (habitat mapping, species distribution) comparable?

---This is an important concern for time series analysis.

DISCOL habitat mapping comparison data

For an area of the western DEA, sampled by the in-situ teams on SO242 1/2, the following are available / being put together:

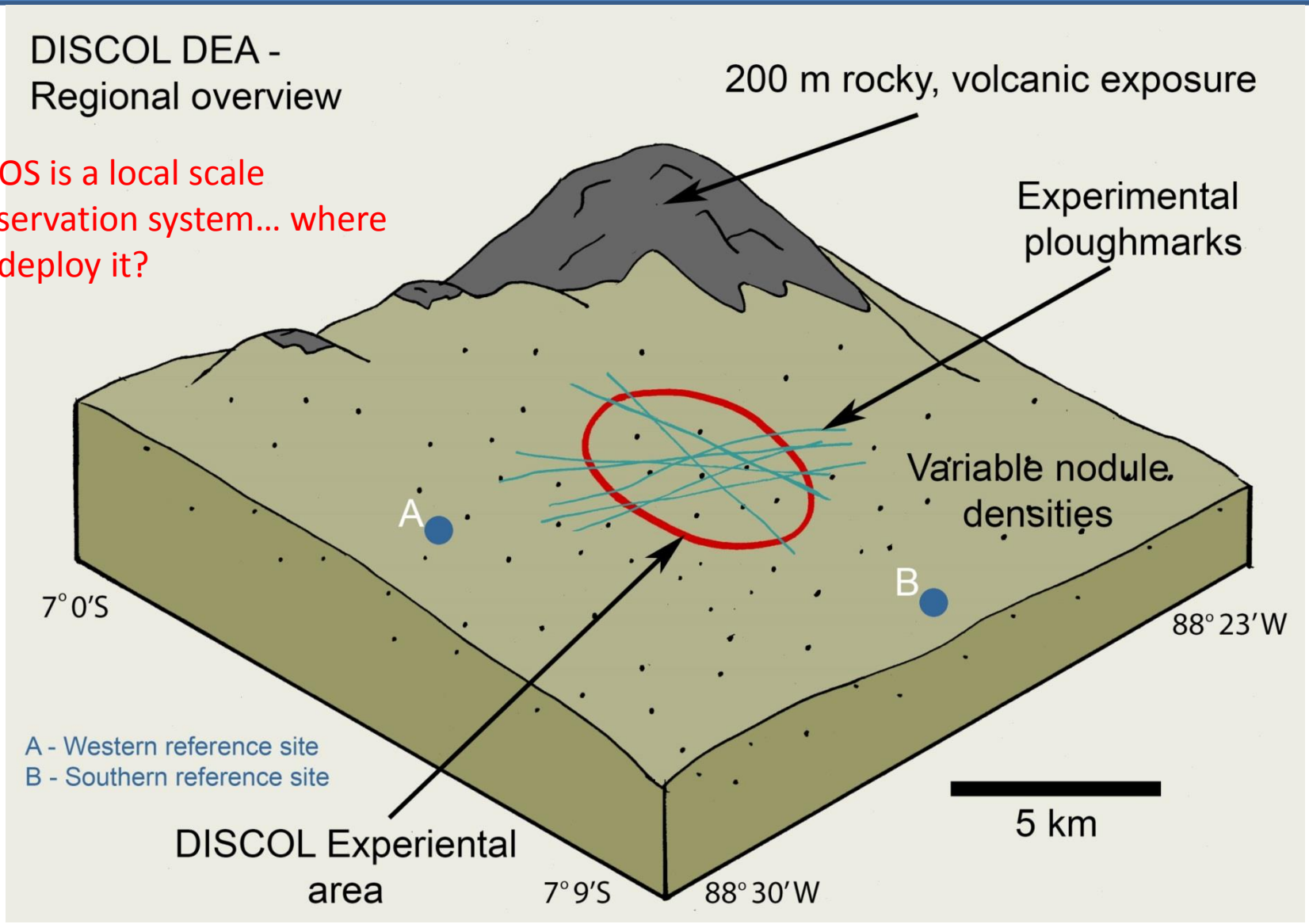
- Pre 2015 OFOS dives
- 1.5 and 3-4 m OFOS SO242/1 and SO242/2 2015 dives
- Multibeam and backscatter data
- AUV imaging data
- Limited ROV footage



This area of the DEA is probably the most applicable for best technical comparisons in habitat mapping / fauna logging approaches to be made.

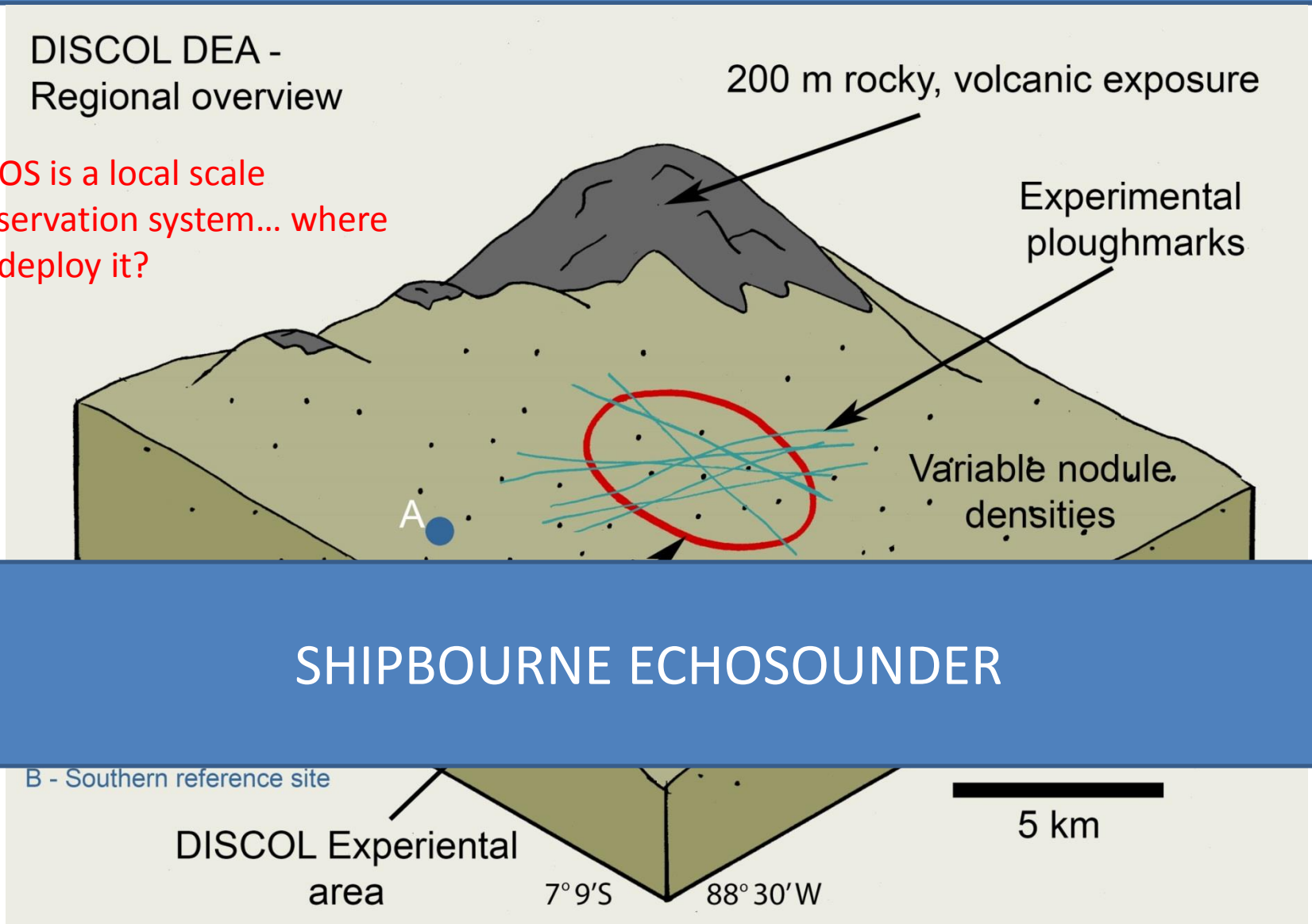
DISCOL AWI OFOS Launcher habitat mapping

OFOS is a local scale observation system… where to deploy it?



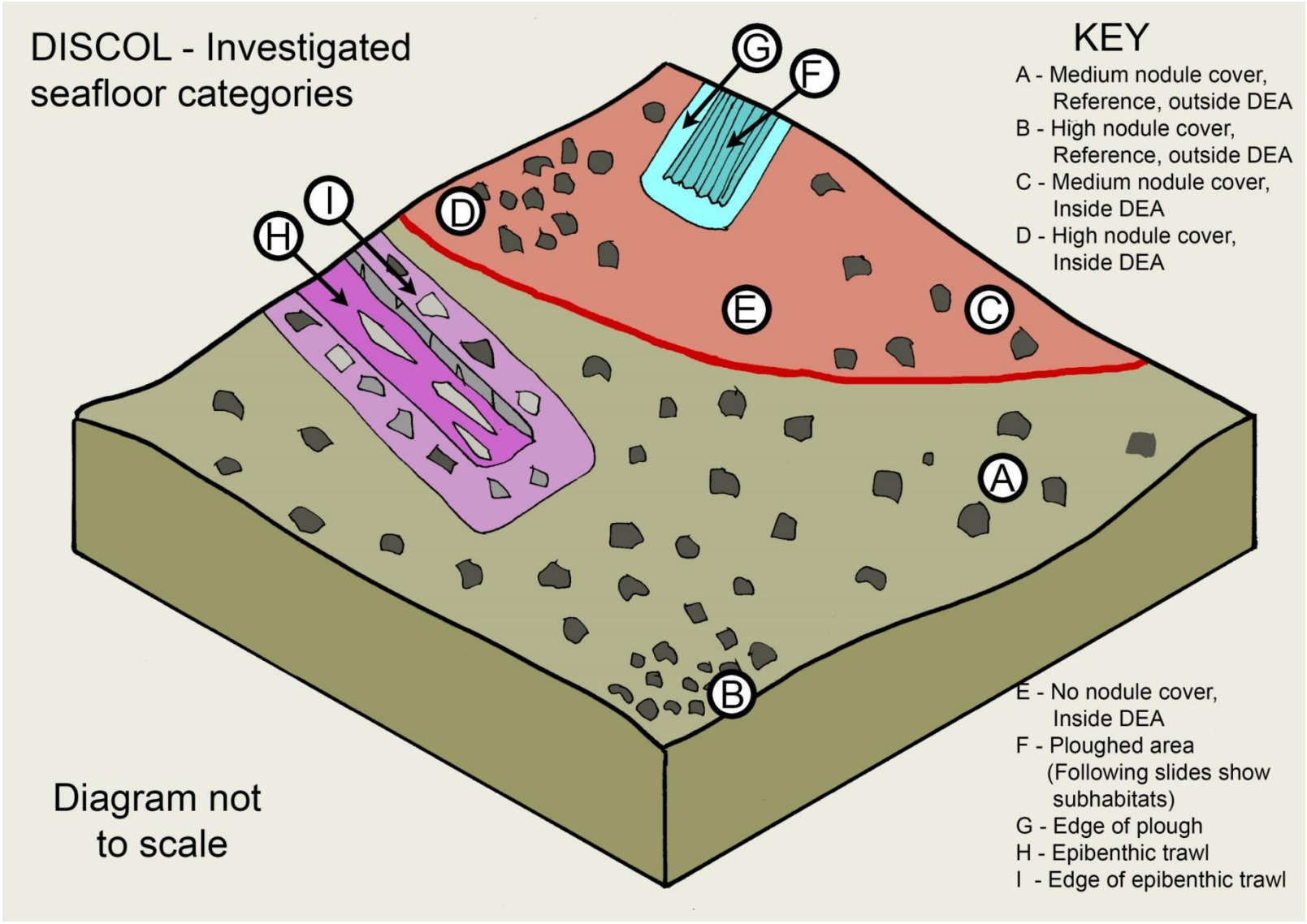
DISCOL AWI OFOS Launcher habitat mapping

OFOS is a local scale observation system… where to deploy it?

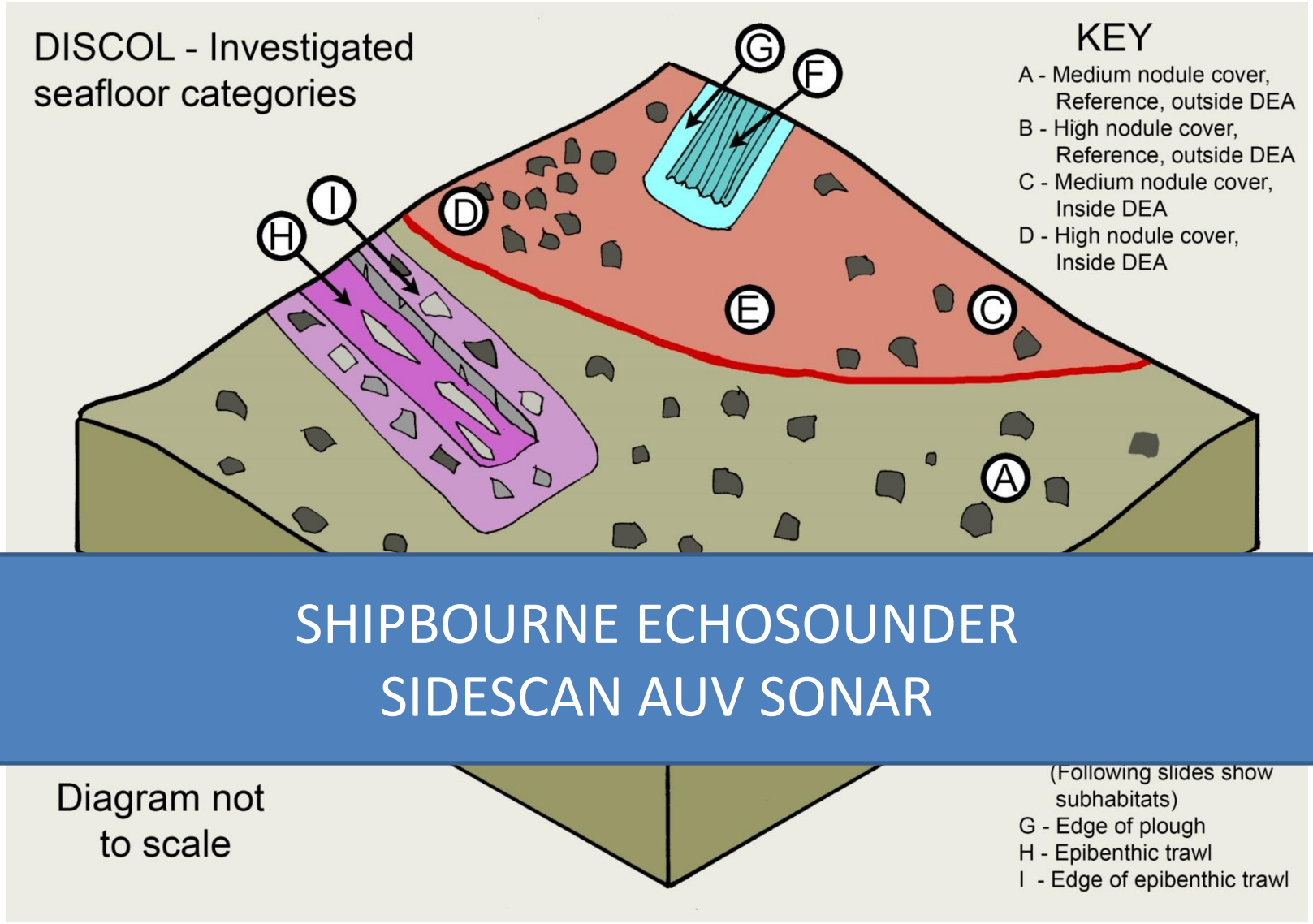


SHIPBOURNE ECHOSOUNDER

DISCOL AWI OFOS Launcher habitat mapping

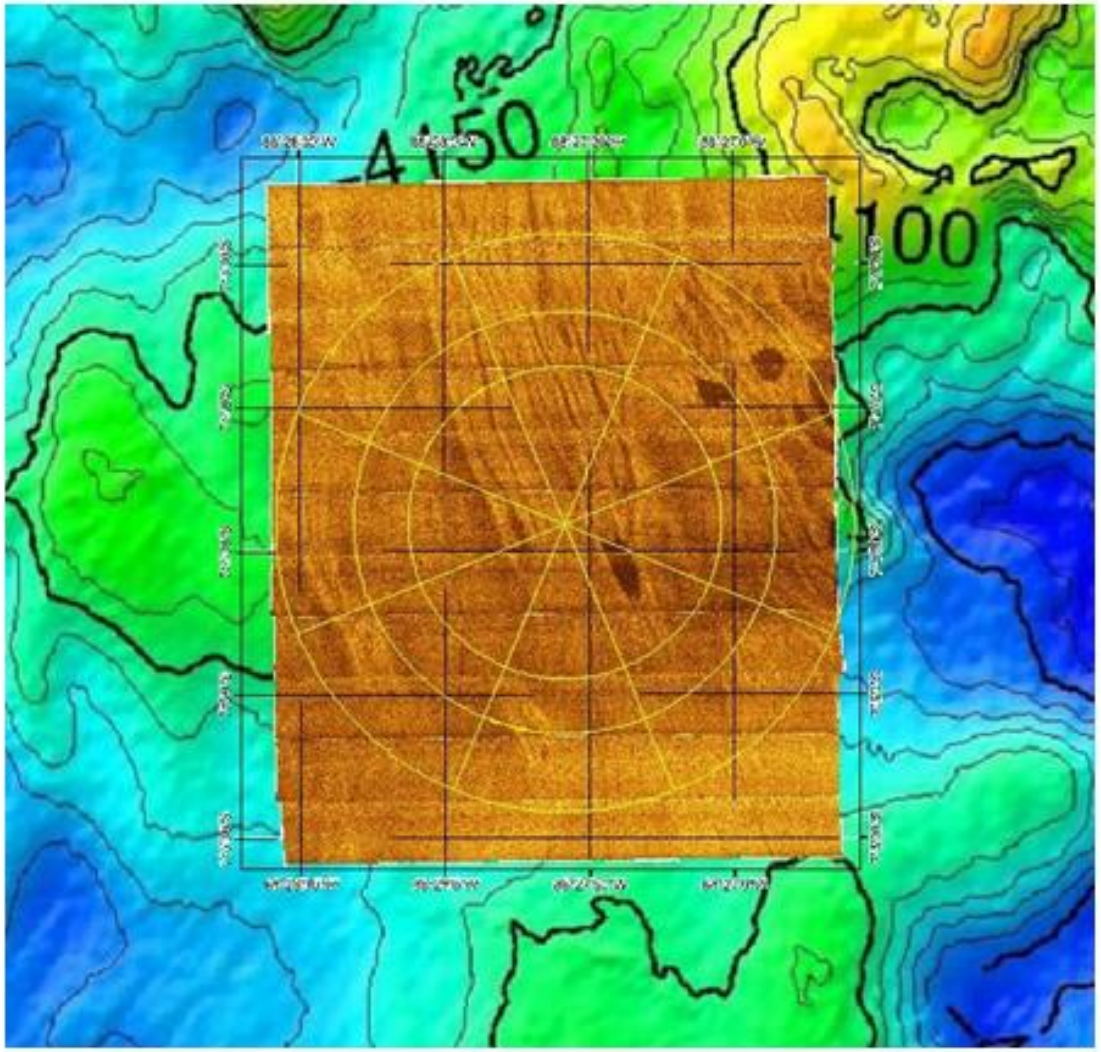


DISCOL AWI OFOS Launcher habitat mapping



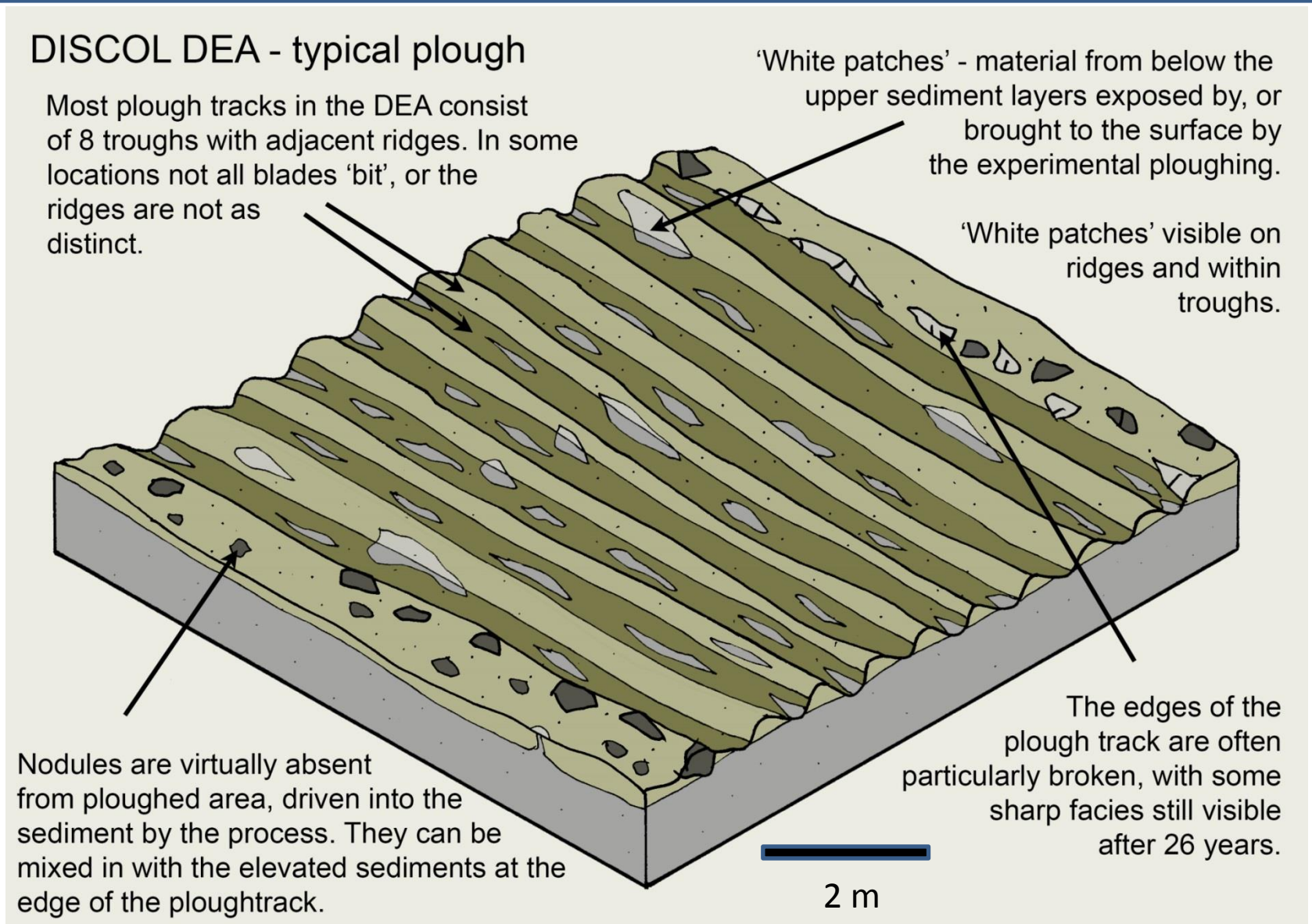
SHIPBOURNE ECHOSOUNDER
SIDESCAN AUV SONAR

DISCOL AWI OFOS Launcher habitat mapping

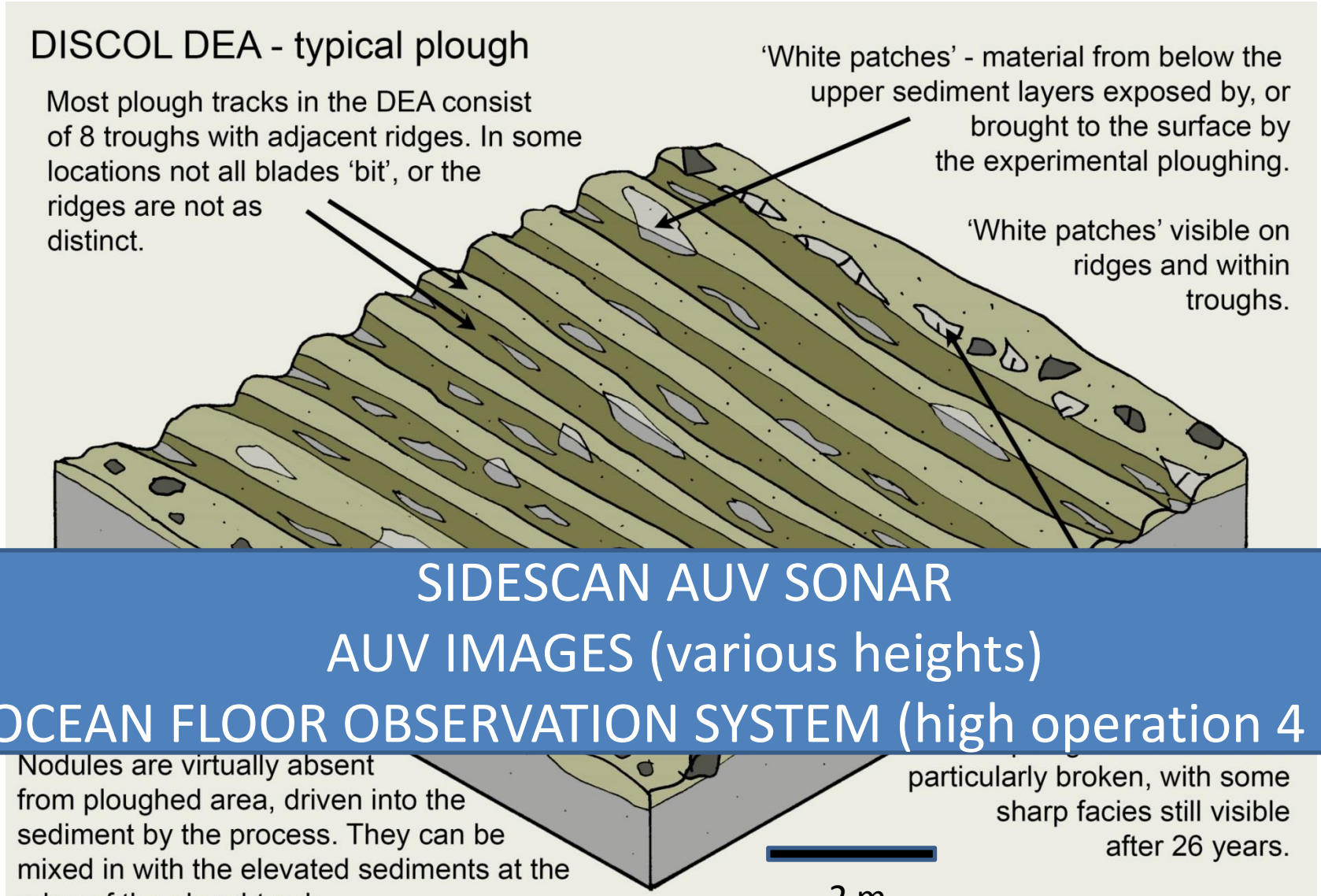


GEOMAR Shipbourne echosounder and backscatter maps

DISCOL AWI OFOS Launcher habitat mapping

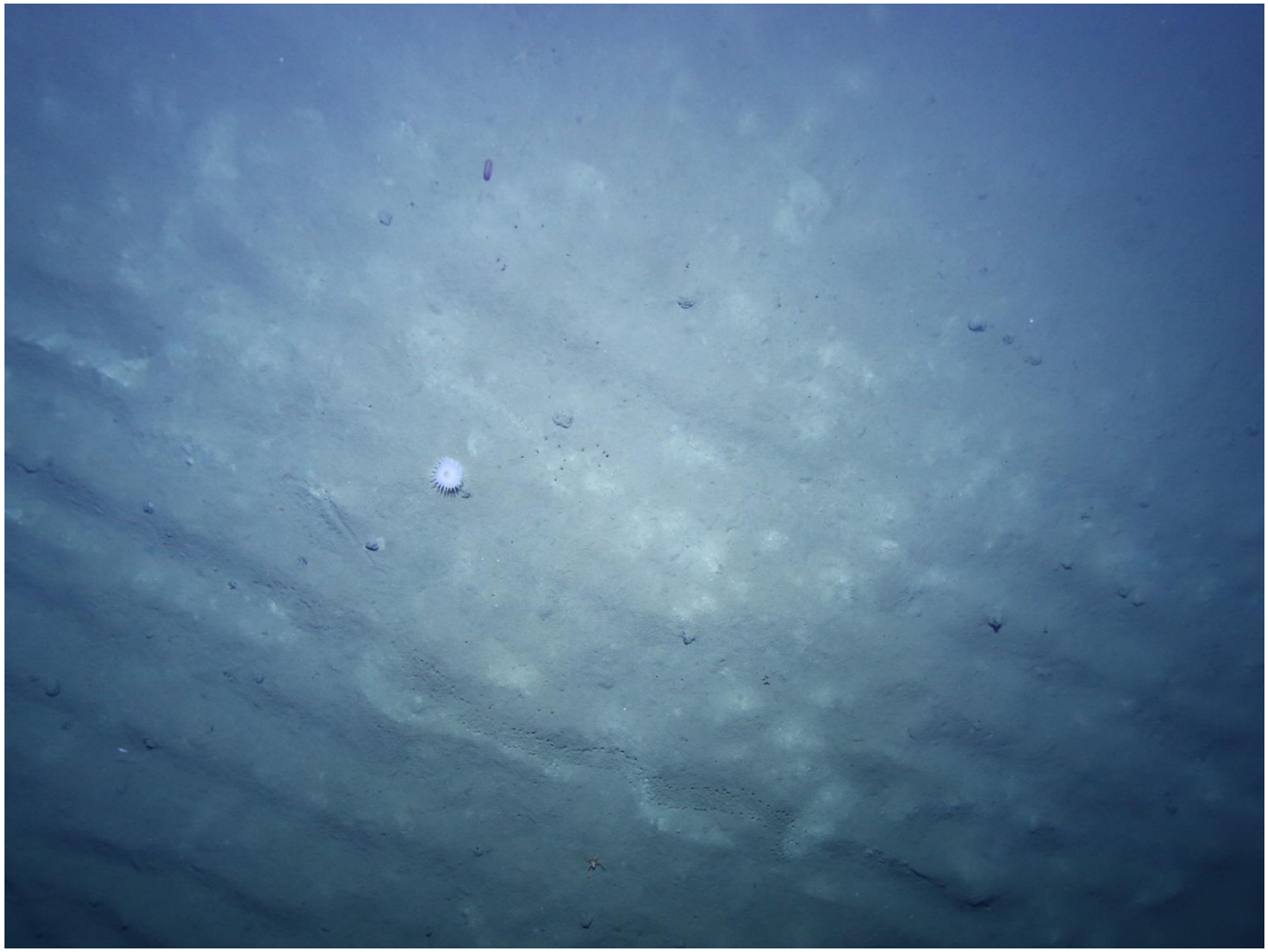


DISCOL AWI OFOS Launcher habitat mapping



SIDESCAN AUV SONAR
AUV IMAGES (various heights)
OCEAN FLOOR OBSERVATION SYSTEM (high operation 4 m)

DISCOL AWI OFOS Launcher habitat mapping

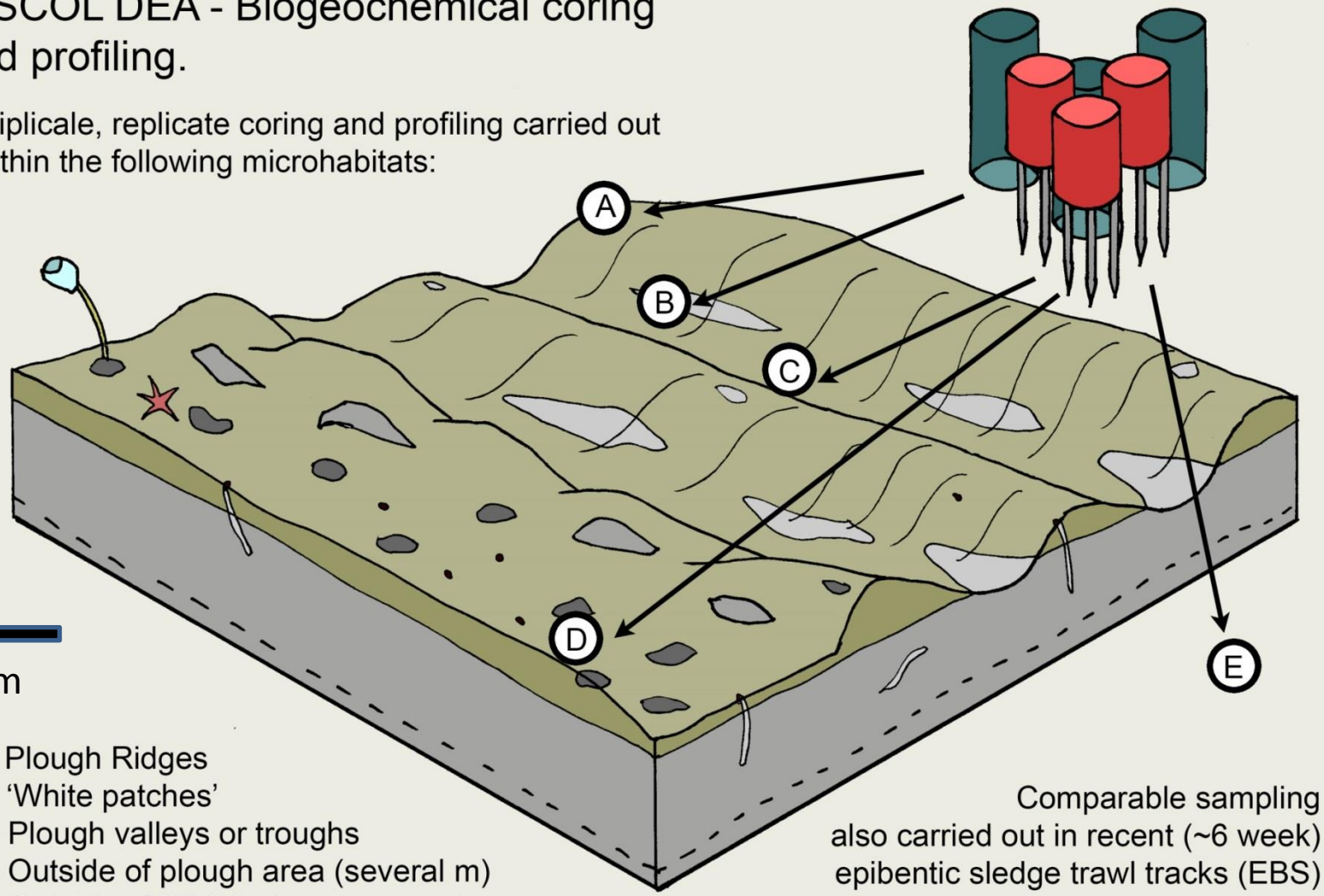


GEOMAR AUV image

DISCOL AWI OFOS Launcher habitat mapping

DISCOL DEA - Biogeochemical coring and profiling.

Triplicale, replicate coring and profiling carried out within the following microhabitats:

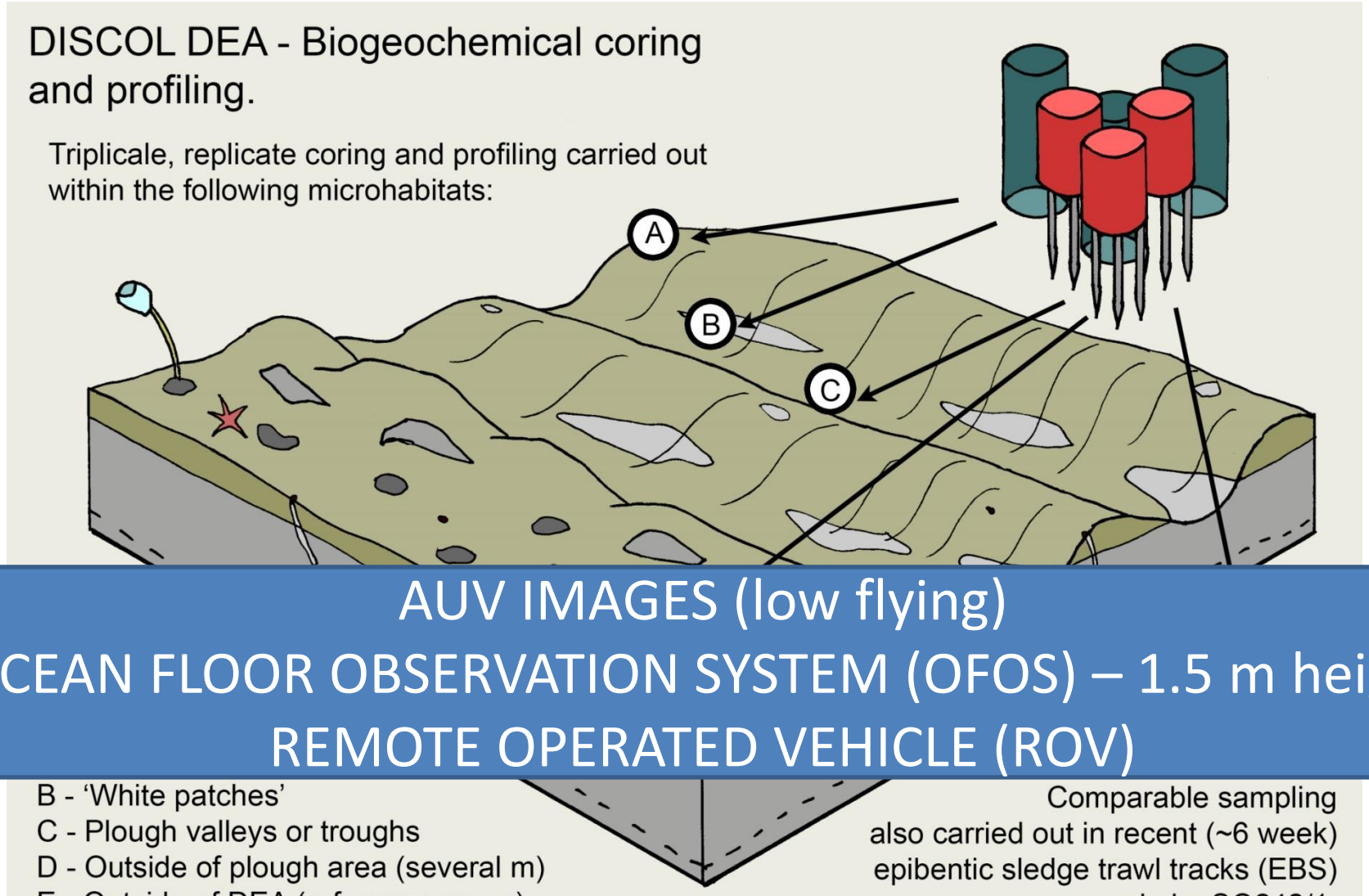


0.5 m

A - Plough Ridges
B - 'White patches'
C - Plough valleys or troughs
D - Outside of plough area (several m)
E - Outside of DEA (reference areas)

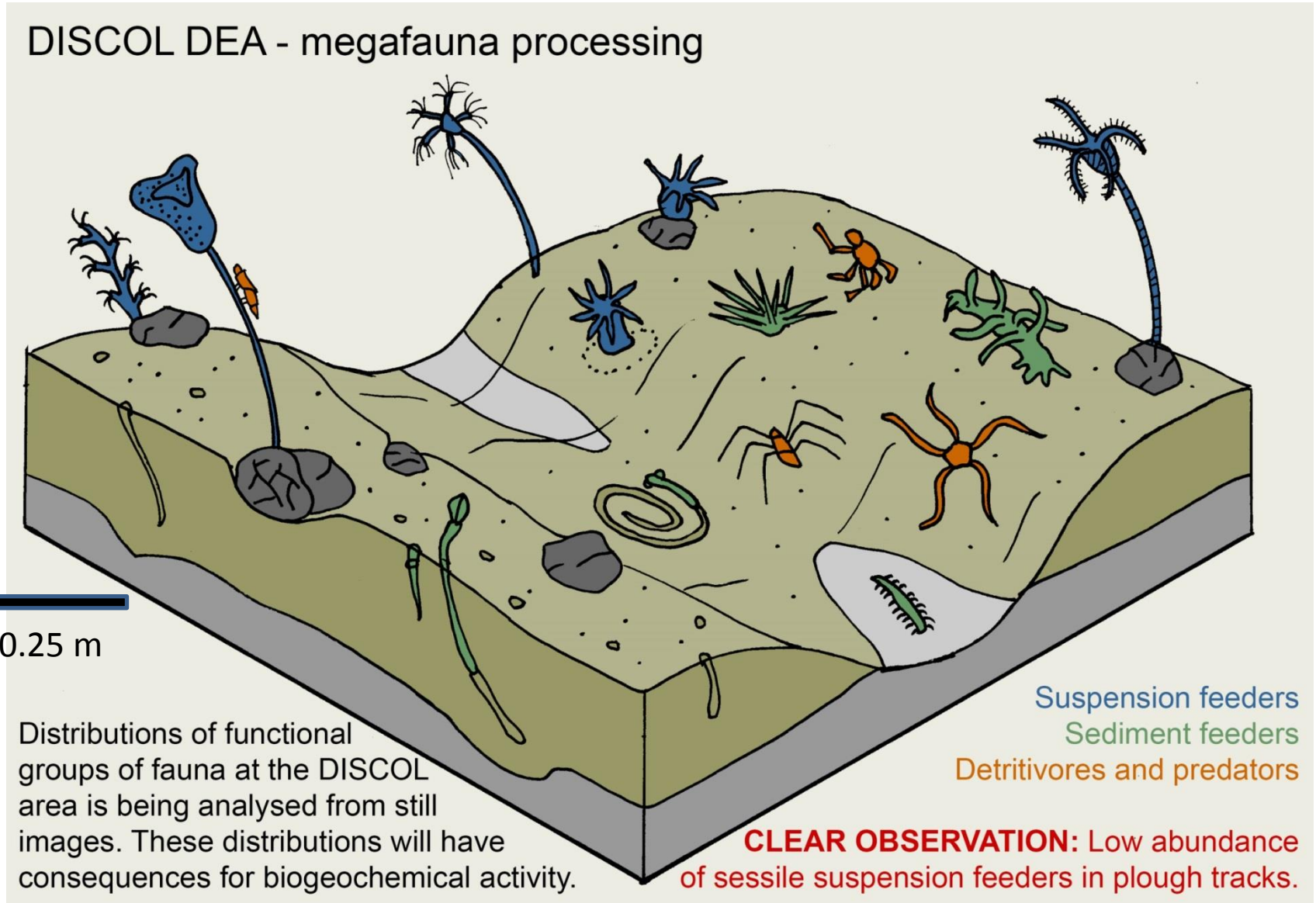
Comparable sampling also carried out in recent (~6 week) epibentic sledge trawl tracks (EBS) made by SO242/1.

DISCOL AWI OFOS Launcher habitat mapping



AUV IMAGES (low flying)
OCEAN FLOOR OBSERVATION SYSTEM (OFOS) – 1.5 m height
REMOTE OPERATED VEHICLE (ROV)

DISCOL AWI OFOS Launcher habitat mapping



DISCOL AWI OFOS Launcher habitat mapping

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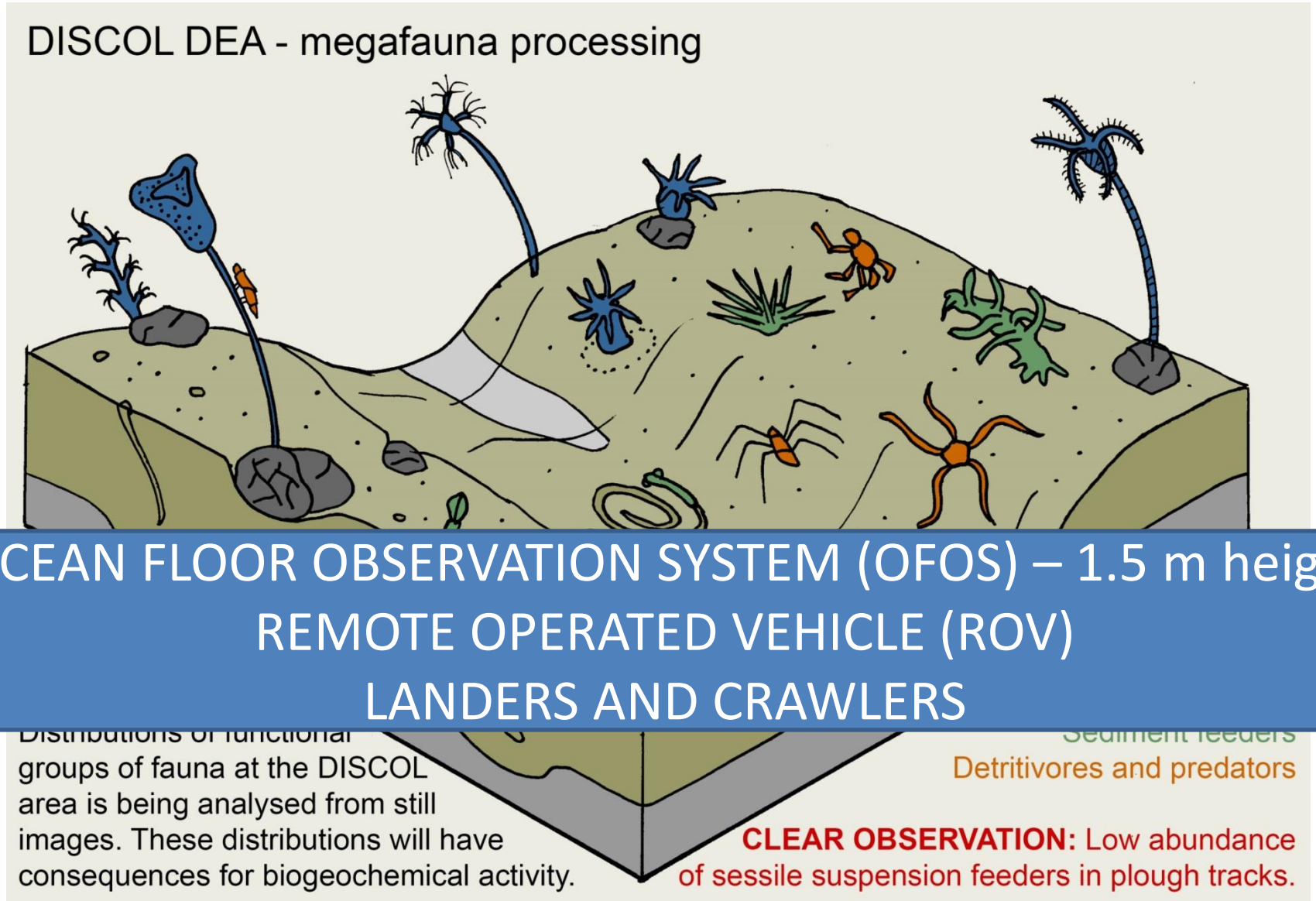


OCEAN FLOOR OBSERVATION SYSTEM (OFOS) – 1.5 m height
REMOTE OPERATED VEHICLE (ROV)
LANDERS AND CRAWLERS

DISCOL AWI OFOS Launcher habitat mapping

Feeding clade examples:

DISCOL AWI OFOS Launcher habitat mapping

Holothurians – Sediment feeders

DISCOL AWI OFOS Launcher habitat mapping

Hemichordates – Sediment feeders

DISCOL AWI OFOS Launcher habitat mapping

Sponges – Suspension feeders

DISCOL AWI OFOS Launcher habitat mapping

Crinoids – Suspension feeders

DISCOL AWI OFOS Launcher habitat mapping

Anenomes – Suspension feeders / Predators

DISCOL AWI OFOS Launcher habitat mapping

Seastars and ophiuroids – Detritivores and Predators

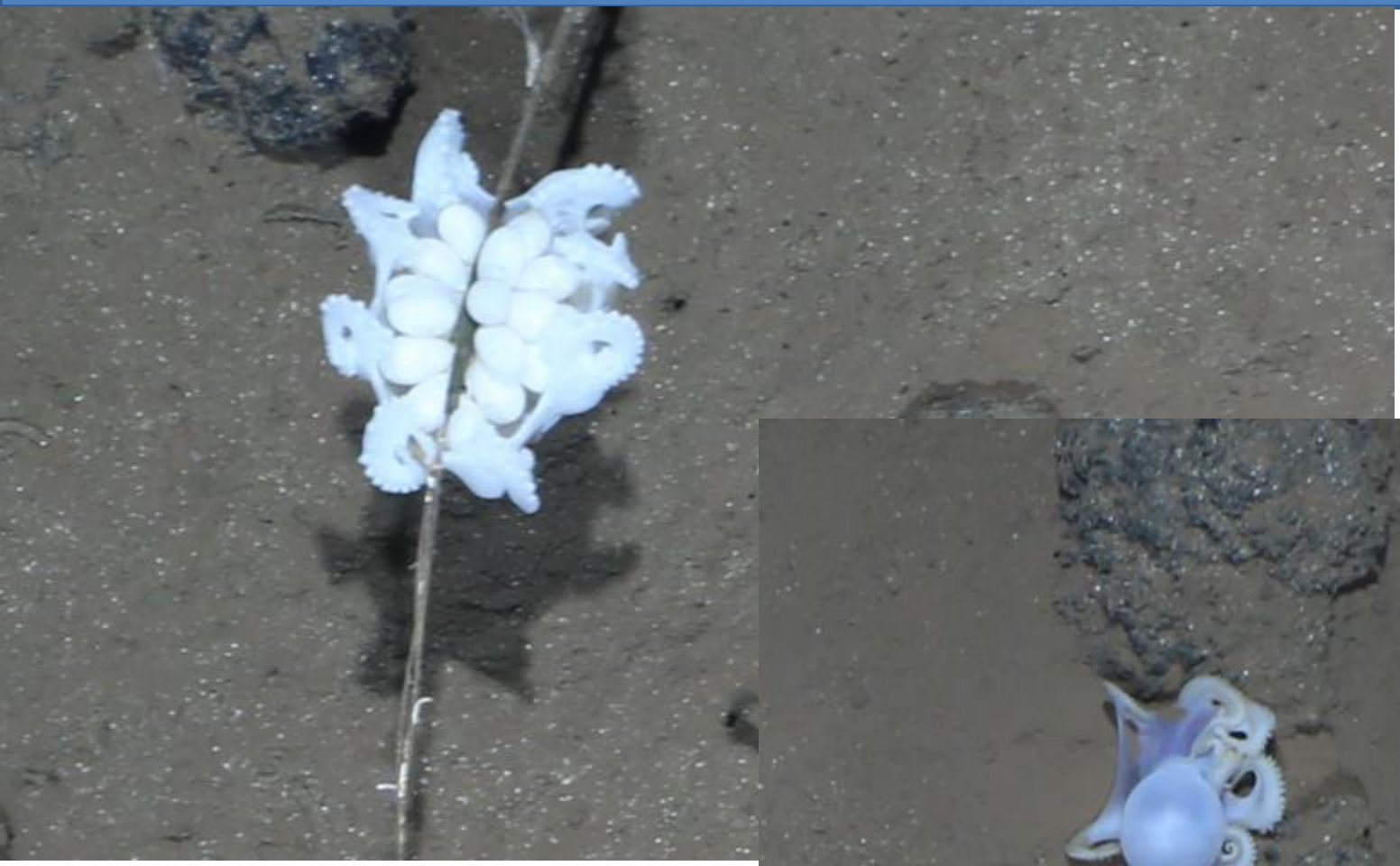
DISCOL AWI OFOS Launcher habitat mapping

Habitat engineer / habitat niche providers very important at DISCOL.

..Abundances of such animals differs with microhabitat (based on preliminary results)

Some of these relationships require CLOSE UP IMAGING TO IDENTIFY!

DISCOL AWI OFOS Launcher habitat mapping



DISCOL AWI OFOS Launcher habitat mapping

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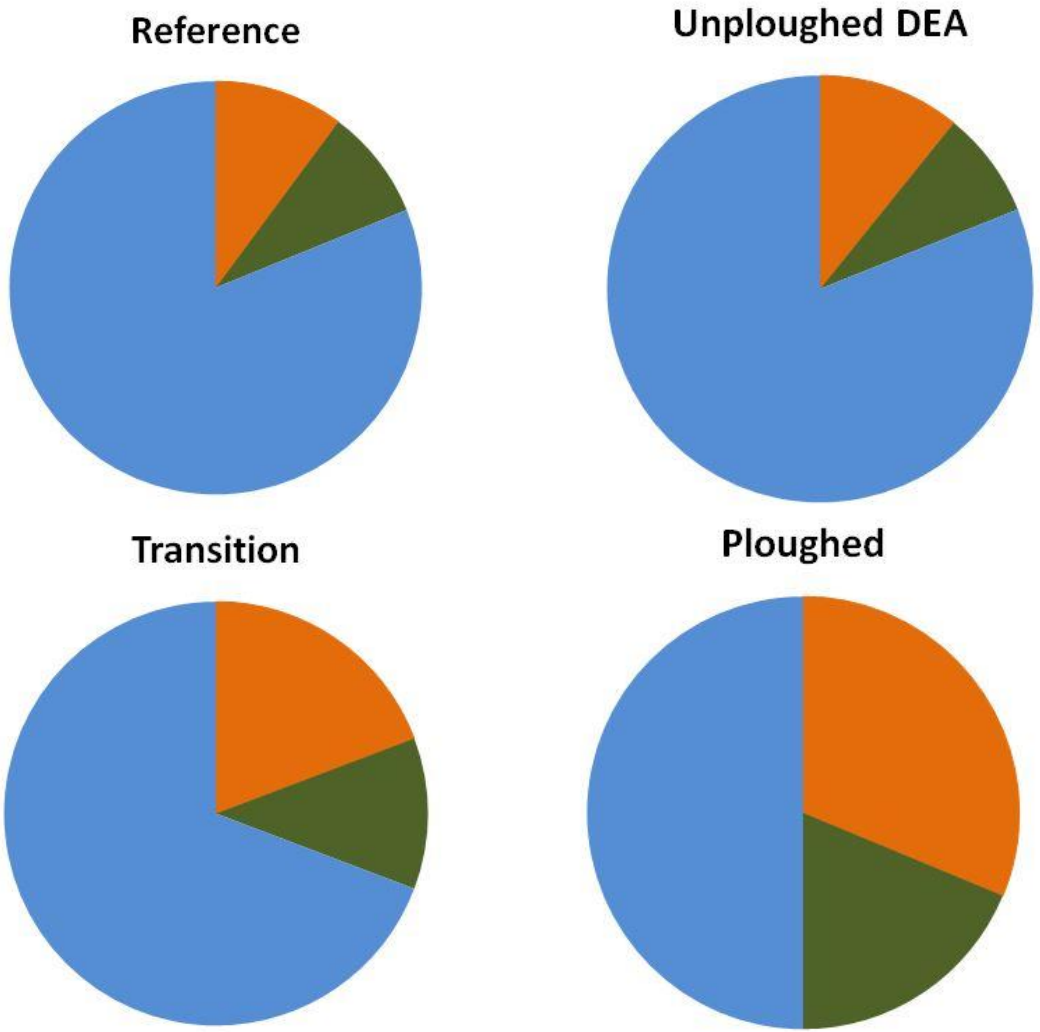
Early feeding clade results, based on ~10% of data, and broad habitat type:



Detritivores and predators

Sediment feeders

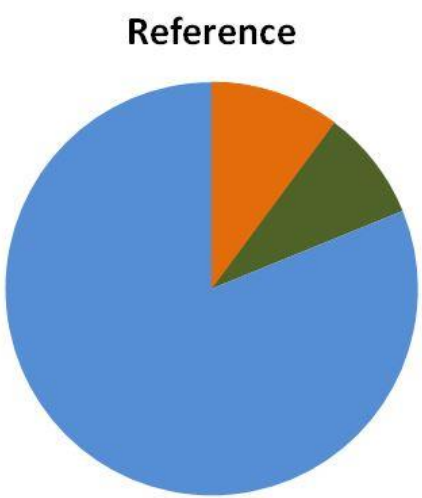
Suspension feeders

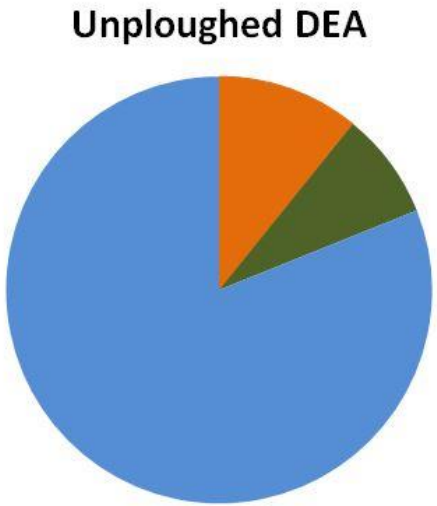
(Data shown as percentages of individuals of observed populations. For actual densities, some data will be presented with WP2)

Biomass and feeding rates , in contrast to individual abundances, not yet assessed.

DISCOL AWI OFOS Launcher habitat mapping

Early feeding clade results, based on ~10% of data, and broad habitat type:





Detritivores and predators

Sediment feeders

Suspension feeders

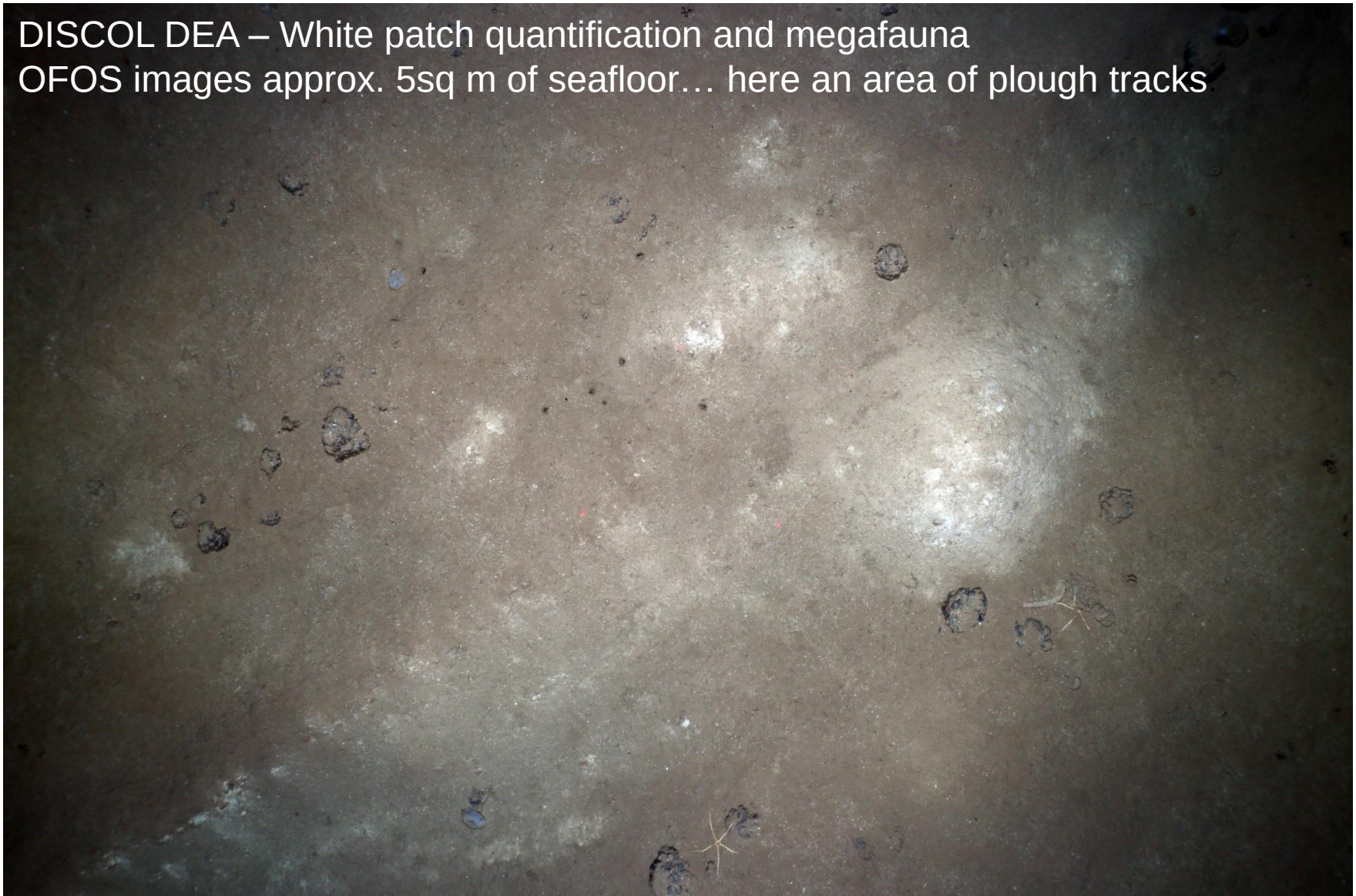
Transition

Ploughed

What about the finer scale heterogeneity?

observed populations. For actual densities, some data will be presented with WP2)

DISCOL AWI OFOS Launcher habitat mapping



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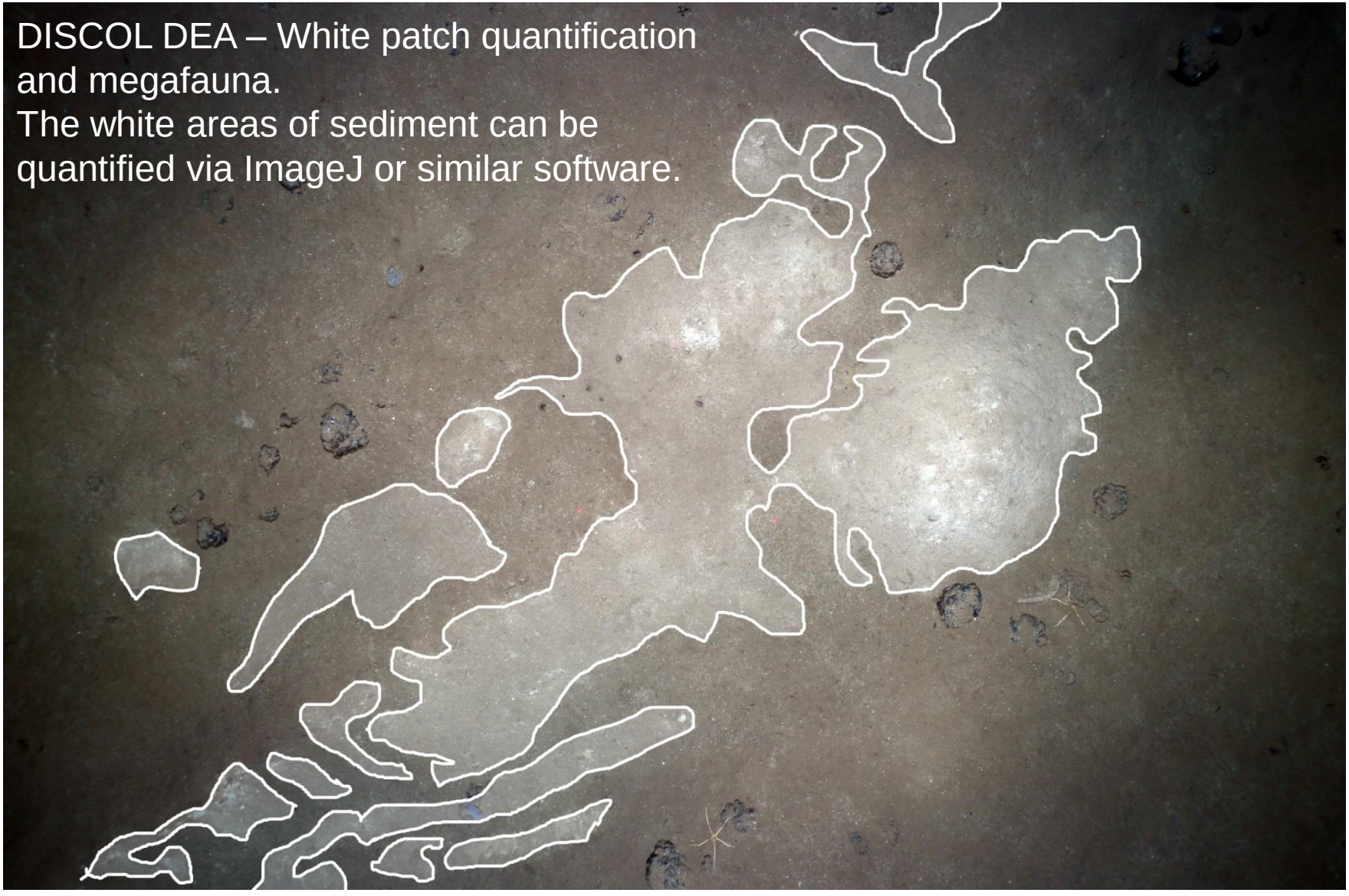

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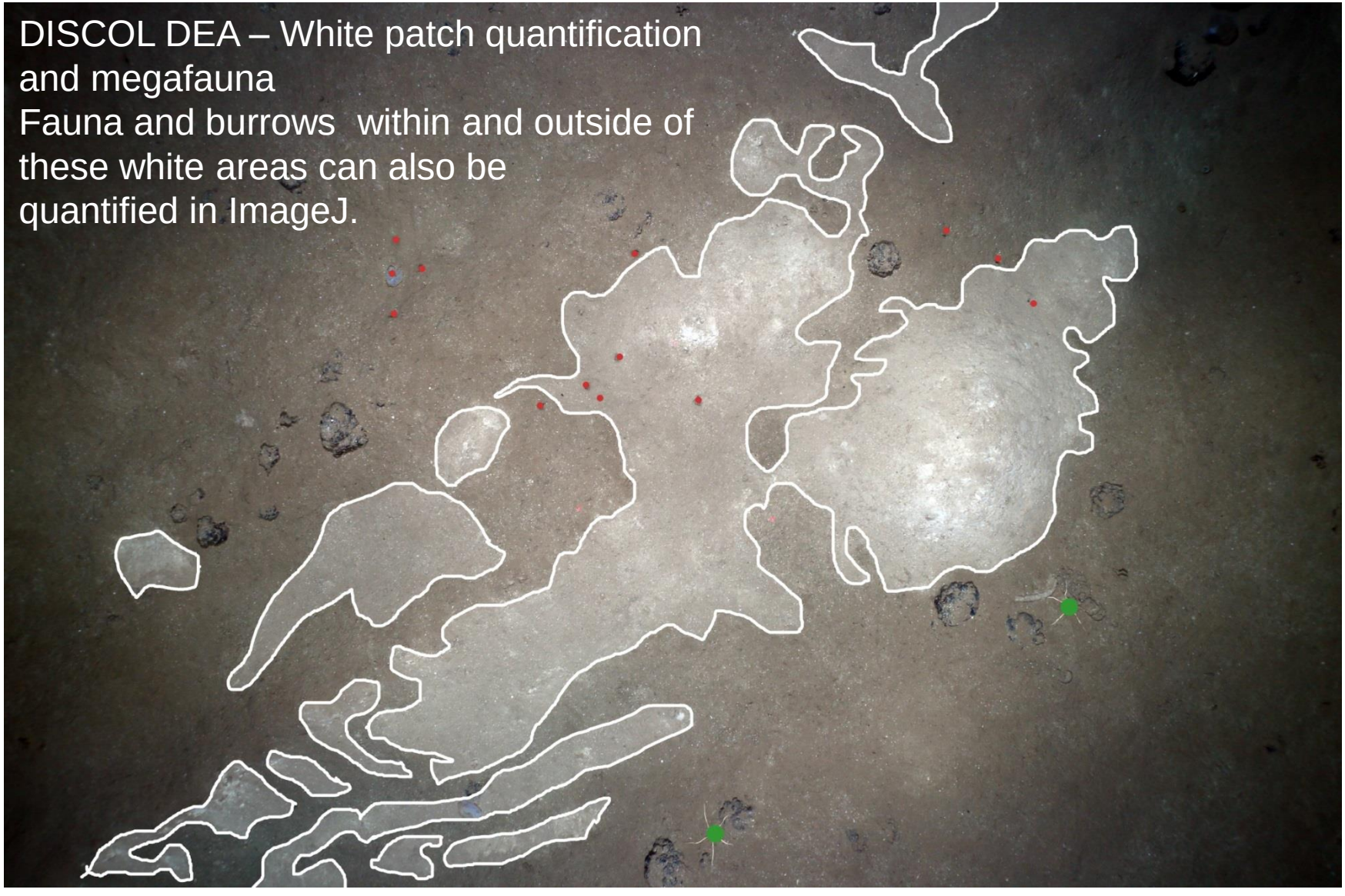

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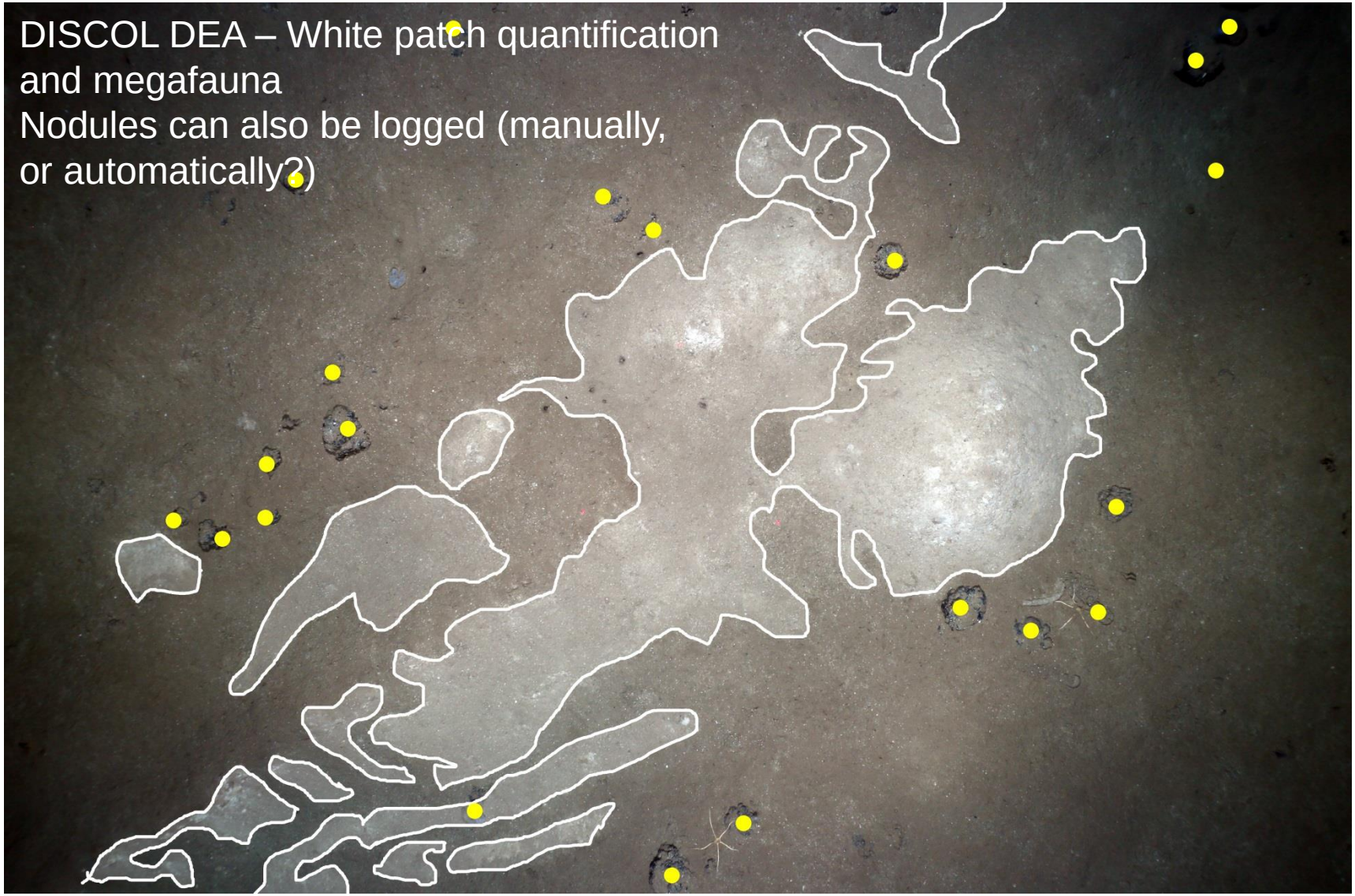


DISCOL AWI OFOS Launcher habitat mapping

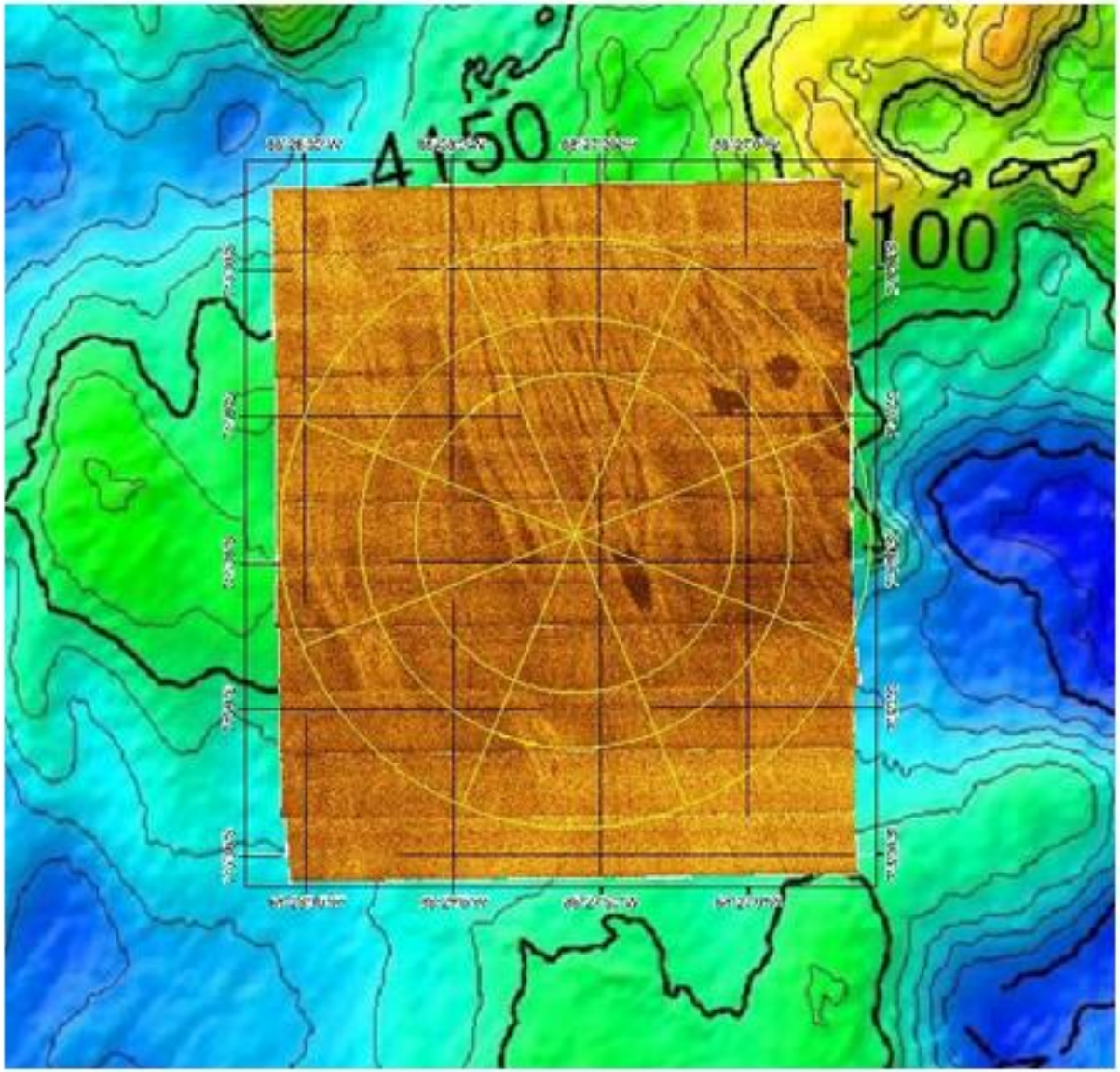
DISCOL AWI OFOS Launcher habitat mapping

SUMMARY

By investigating and mapping regions of the DISCOL area with different equipment, extrapolation of local observations to larger scales is envisioned.

…There is as high heterogeniety in the DISCOL area across a range of scales, so care is needed in this extropolation , however.

..For studies of processes occuring at and within the sediment, a detailed analysis of biodiversity is not essential.



DISCOL AWI OFOS Launcher habitat mapping

SUMMARY

..High quality close-up camera systems can also be used to investigate more focused interactions…

DISCOL AWI OFOS Launcher habitat mapping

SUMMARY

..elucidating relationships with may well be missed due to processing artifacts in production of high resolution mosaics.