



# *Ningaloo Outlook 2 - Taking a Deeper Dive into Deep Reefs at Ningaloo*

Logan Hellmrich





# Deep Reefs

- Major focus = MESOPHOTIC HABITATS
- Building off NO1
- A deeper look into the ecology



# CORAL





# CORAL





# SPONGE



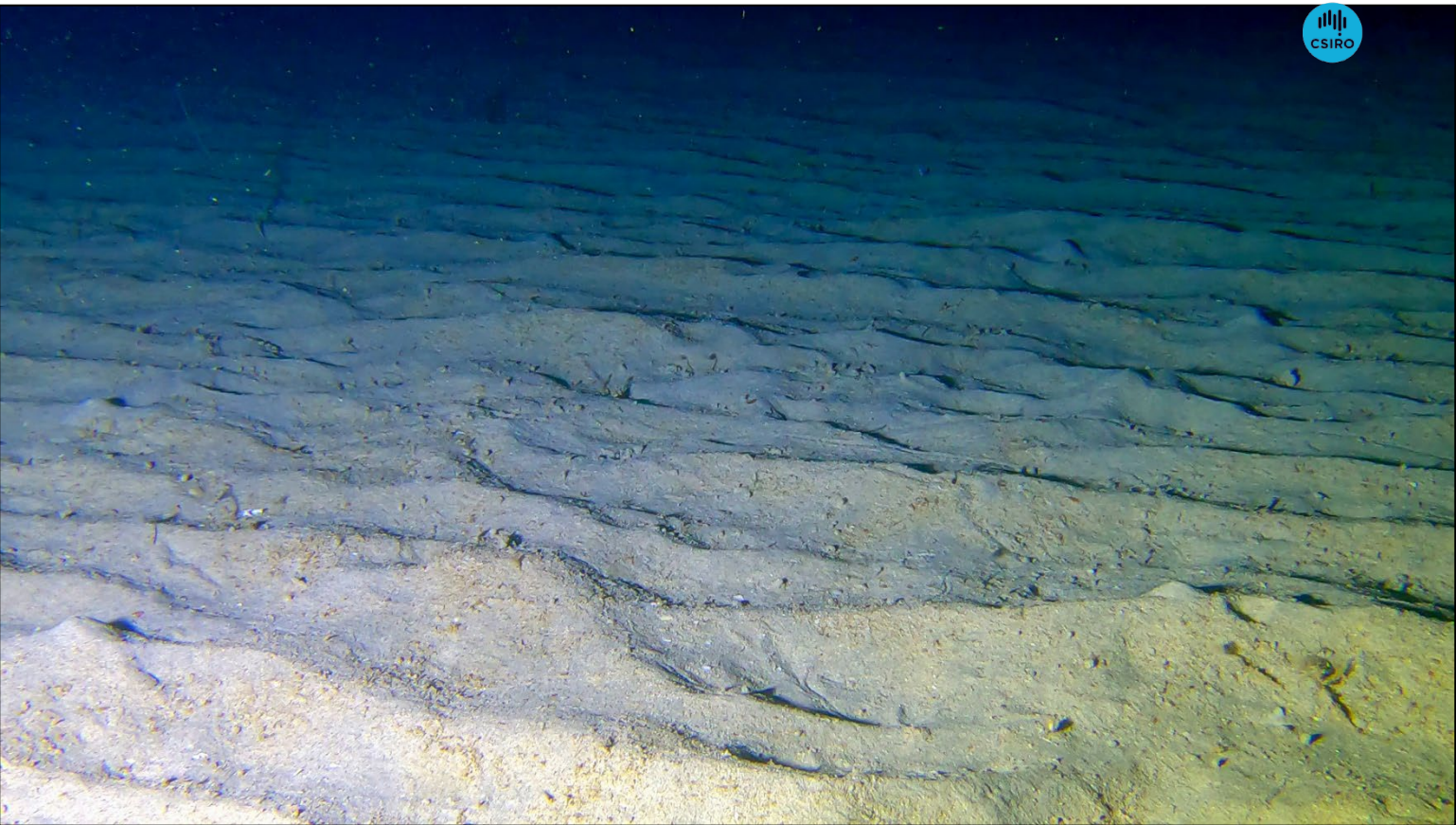


# SPONGE





# SAND





# SAND

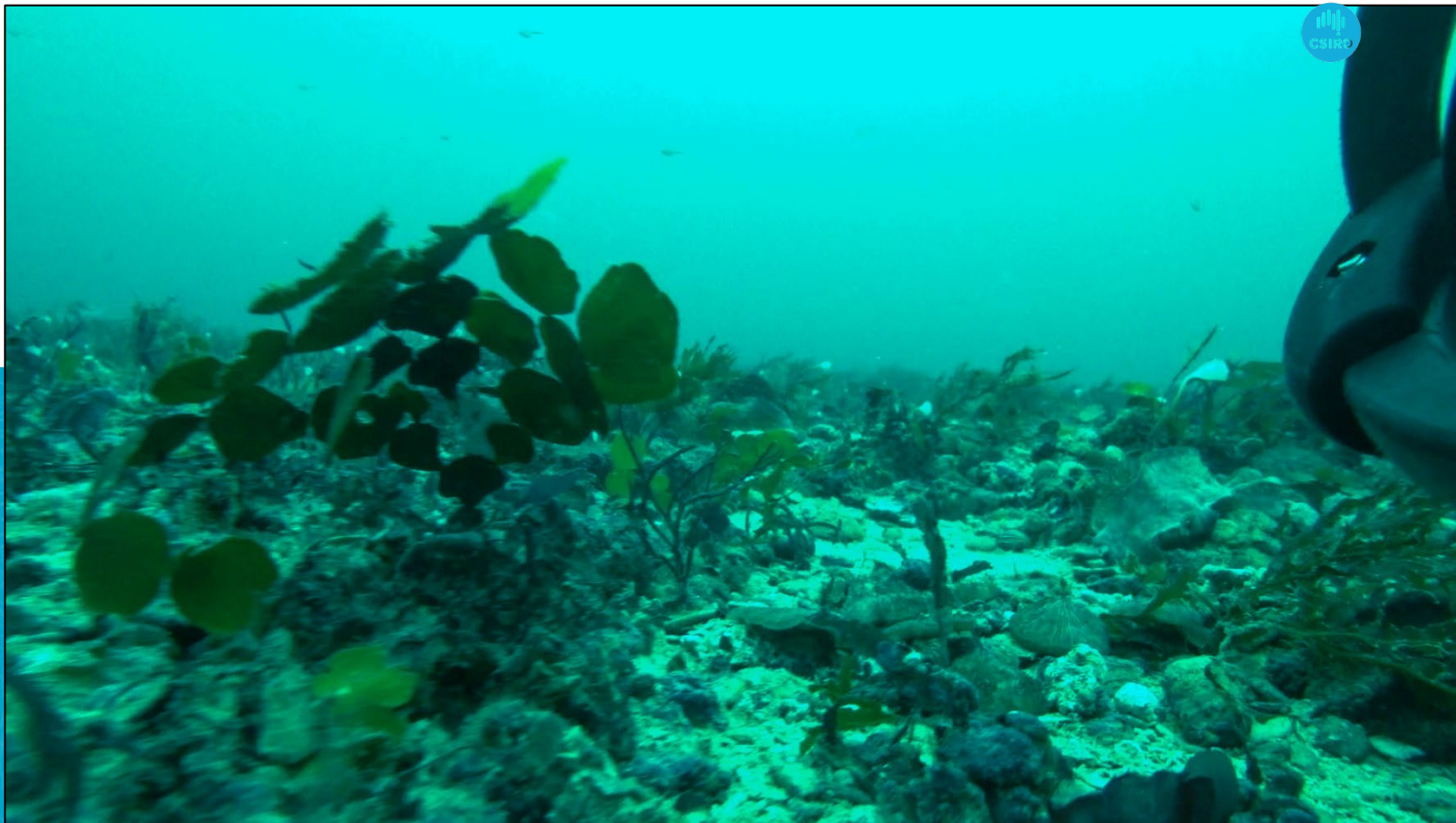
ningaloo  
outlook







# MACRO-ALGAE



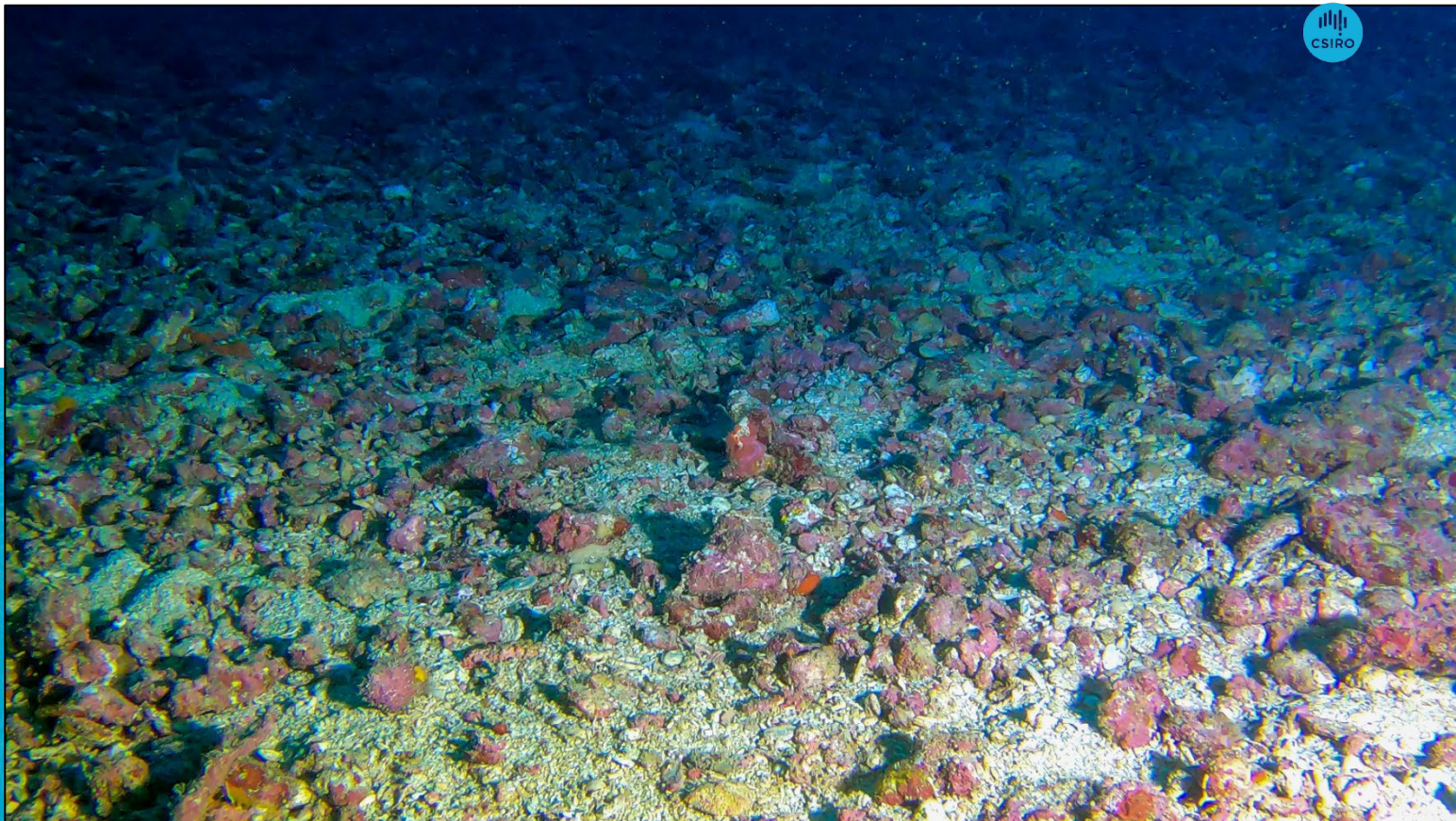


# MACRO-ALGAE





# RHODOLITH





# RHODOLITH





# CYCLOSERIS





# CYCLOSERIS



# Remotely Operated Vehicle (ROV)



SRV8 ROV



ROV controller



Stereo-ROV





# ROV – Fish behaviour paper



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## Stereo-ROV surveys of tropical reef fishes are comparable to stereo-DOVs with reduced behavioural biases

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### ARTICLE INFO

- Keywords:**
- Abundance
  - Coral reef fish
  - Diver operated video
  - Fish behaviour
  - Minimum approach distance
  - Remotely operated vehicle
  - Sanctuary zones
  - Stereo-video

### ABSTRACT

Cumulative anthropogenic impacts such as overfishing, and climate change are placing marine ecosystems under increasing pressure. This includes the loss or degradation of marine habitats and reductions in fish stocks, with conservation and fisheries management strategies aiming to mitigate, or reverse the effects. Measuring the effectiveness of management actions on fish requires accurate data on the abundance and size of fishes. Diver operated stereo-video systems (stereo-DOVs) have become a widely accepted method for surveying reef fish but have known biases and constraints. A new generation of small and affordable remotely operated vehicles (ROVs) can carry a stereo-video system to collect reef fish data without the need for divers. However, before ROVs are adopted there is a need to understand how they compare to other conventional survey methods. We compared how stereo-DOVs and stereo-ROVs influenced fish behaviour and sampled coral reef fish assemblages inside and outside sanctuary zones in the Ningaloo Marine Park, Northern Western Australia. In general, the numbers of species, individuals and the assemblage composition did not differ significantly between survey techniques and detected consistent patterns in the assemblage composition across locations and inside and outside sanctuary zones. Both methods recorded similar proportions of length measurements (68% and 70% for stereo-DOV and stereo-ROV respectively). Fishes were significantly more wary and exhibited more flight responses towards stereo-DOVs when compared to stereo-ROVs. The use of ROVs has the potential to be a cost-effective method of surveying reef fish while eliminating the health and safety risks involved with SCUBA diving. Given the comparable metrics as well as reduced behavioural bias and logistical advantages of using stereo-ROVs, we recommend stereo-ROVs as a viable alternative to stereo-DOVs surveys.

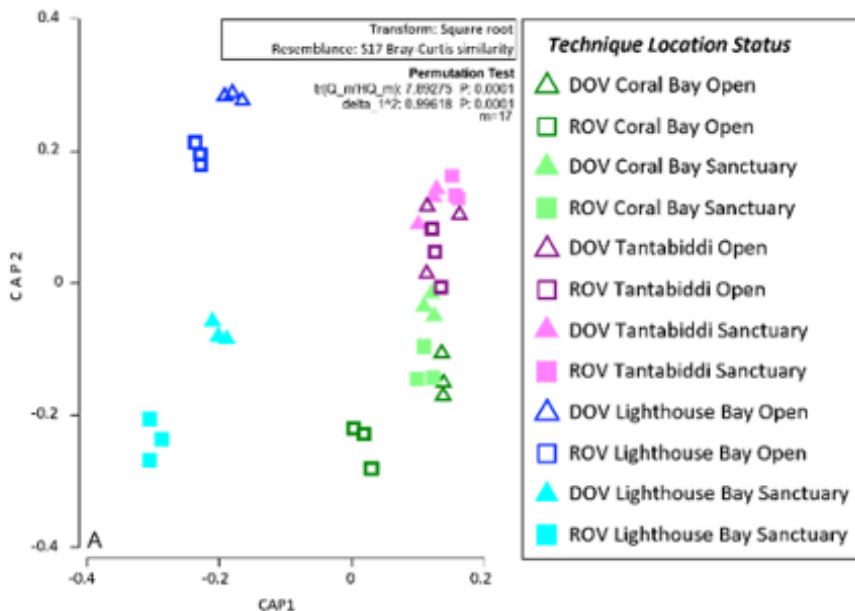


# ROV results

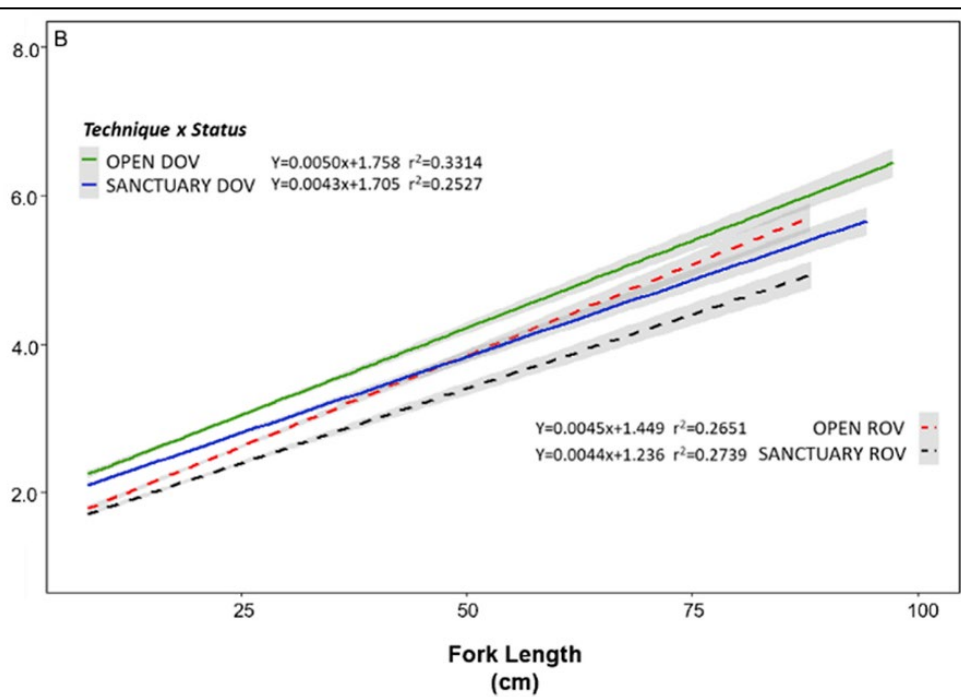


## Similar assemblage patterns

L.S. Hellmrich et al.

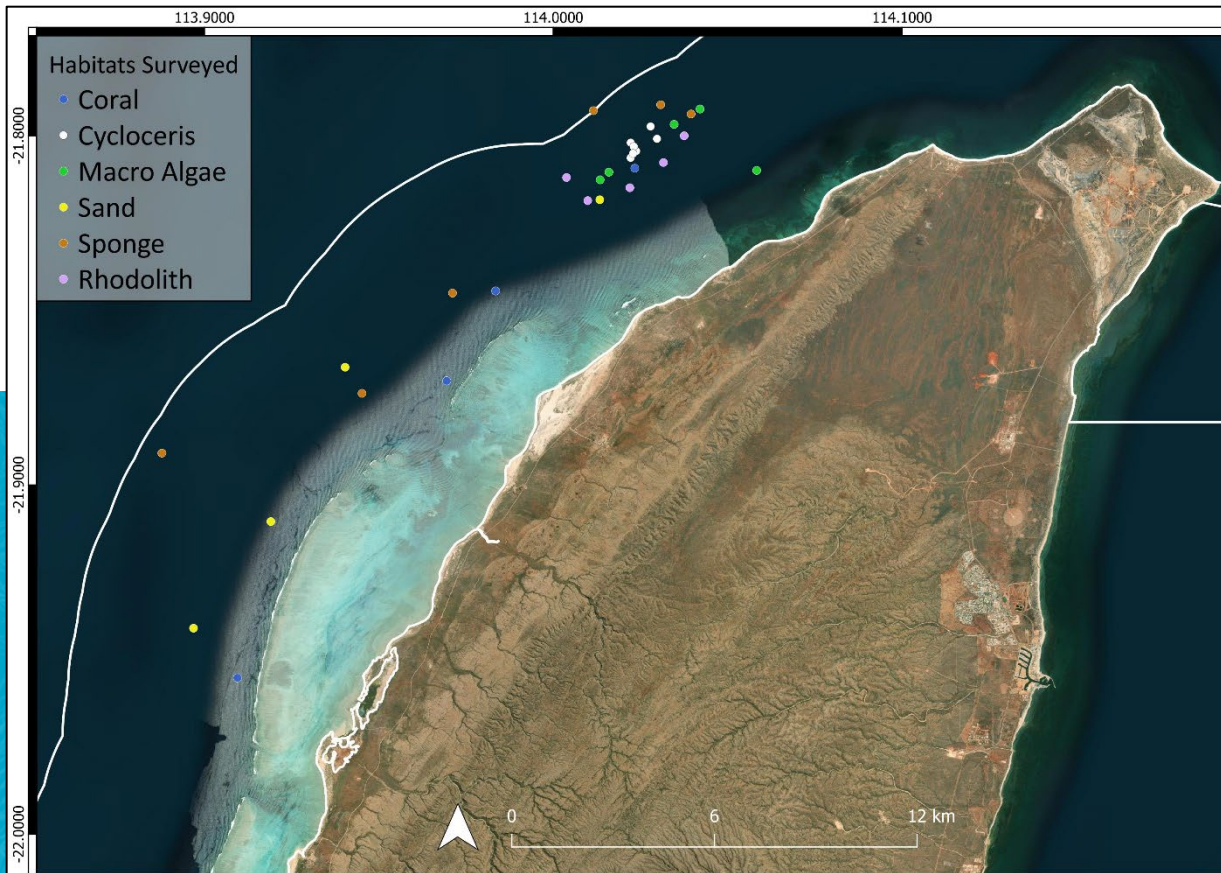


## Decreased wariness





# ROVs to identify habitat users





59m



# Scooping a COT



Cycloseris 38m



Grappling hook





# Grappling a settlement collector



Cycloseris 38m



# Recruitment study March - October







# Tile Images



Sponge site



Macro algae site



Coral site



Rhodolith site



# Cages of bioballs





# Recruited organisms





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# Lab processing eDNA & microscope



# Baited Remotely Operated Video (BRUV)



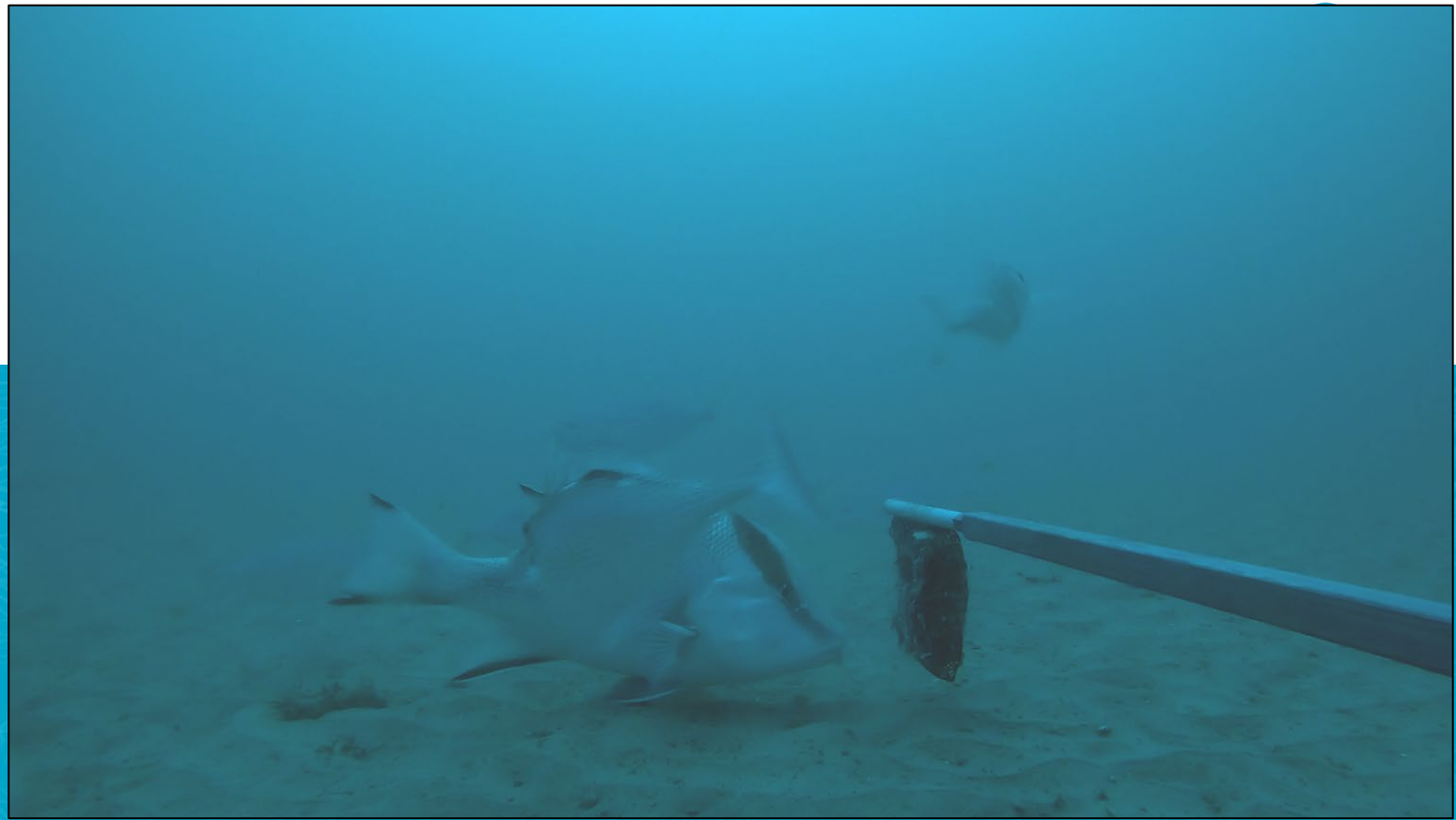


# Coral 24m





# Sand 60m





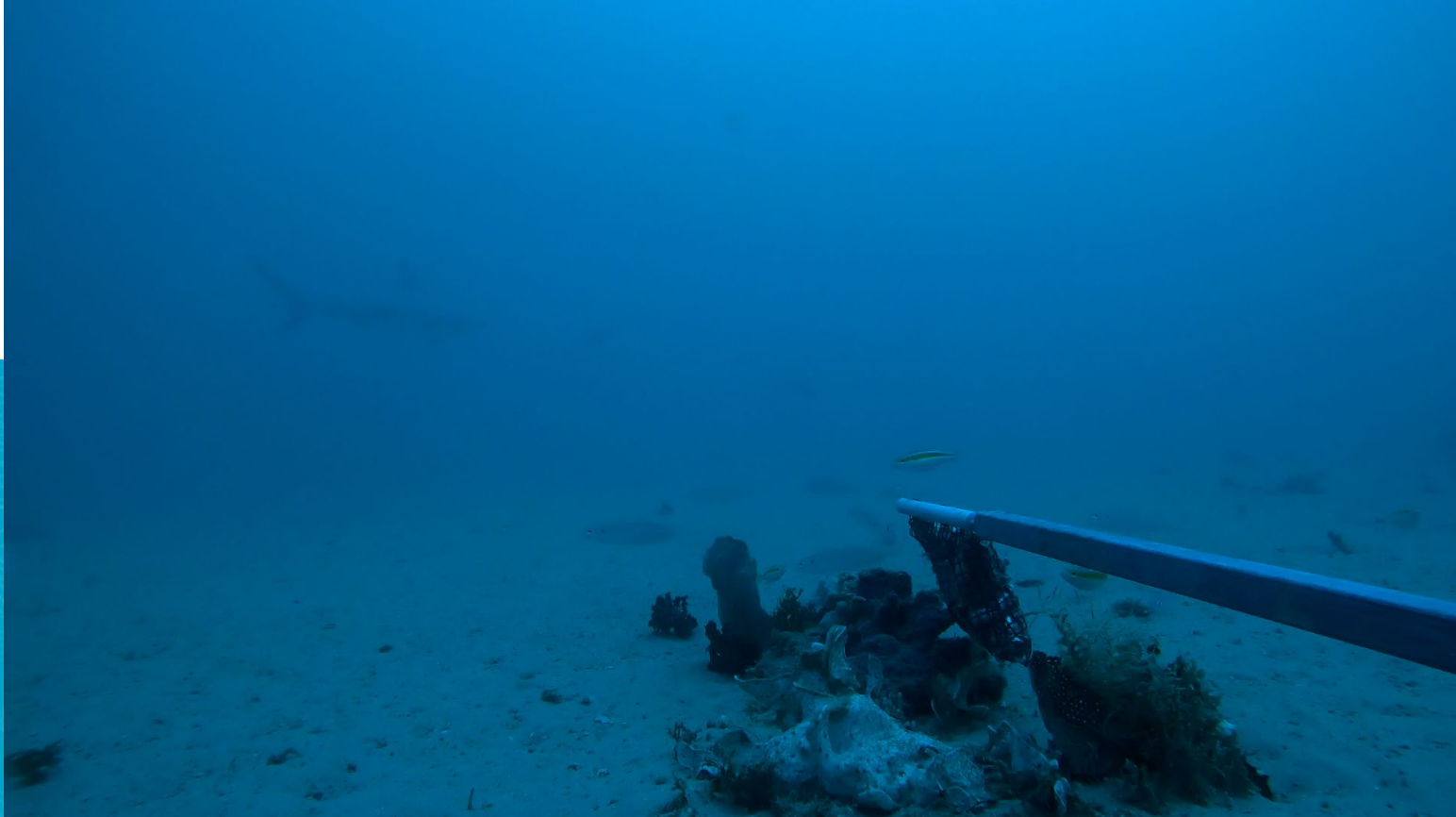


# Cycloseris 38m



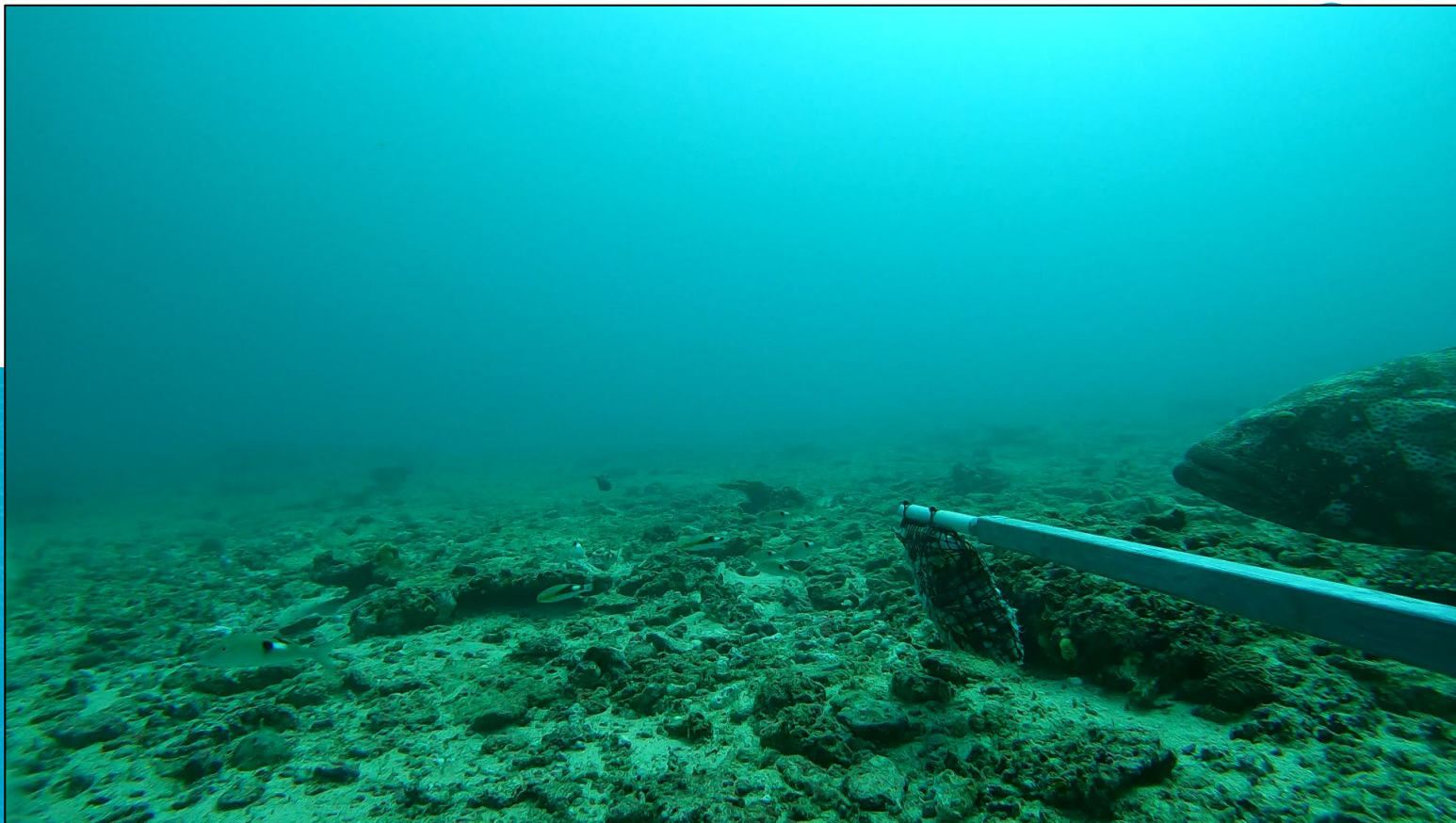


# Sand 50m





# Rubble 25m





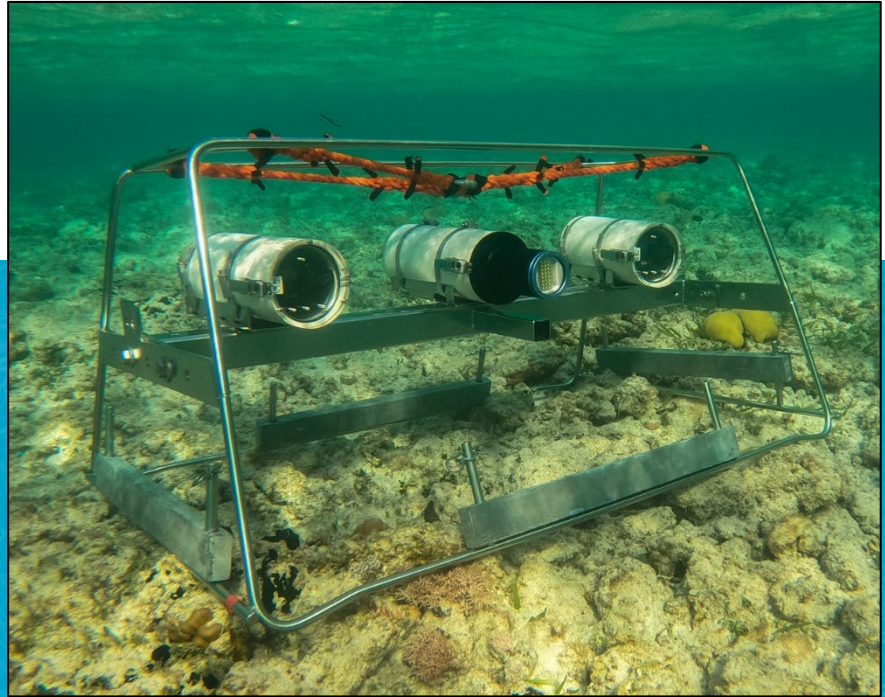
# Sand 68m



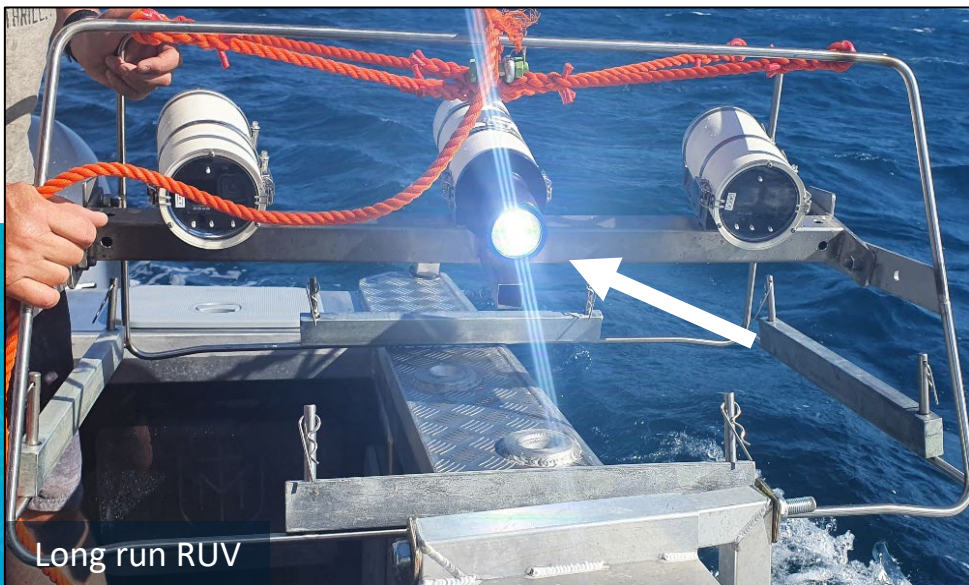


# Long Run Remotely Operated Video (RUV)

Similar to commonly known BRUV



# RUV vs BRUV



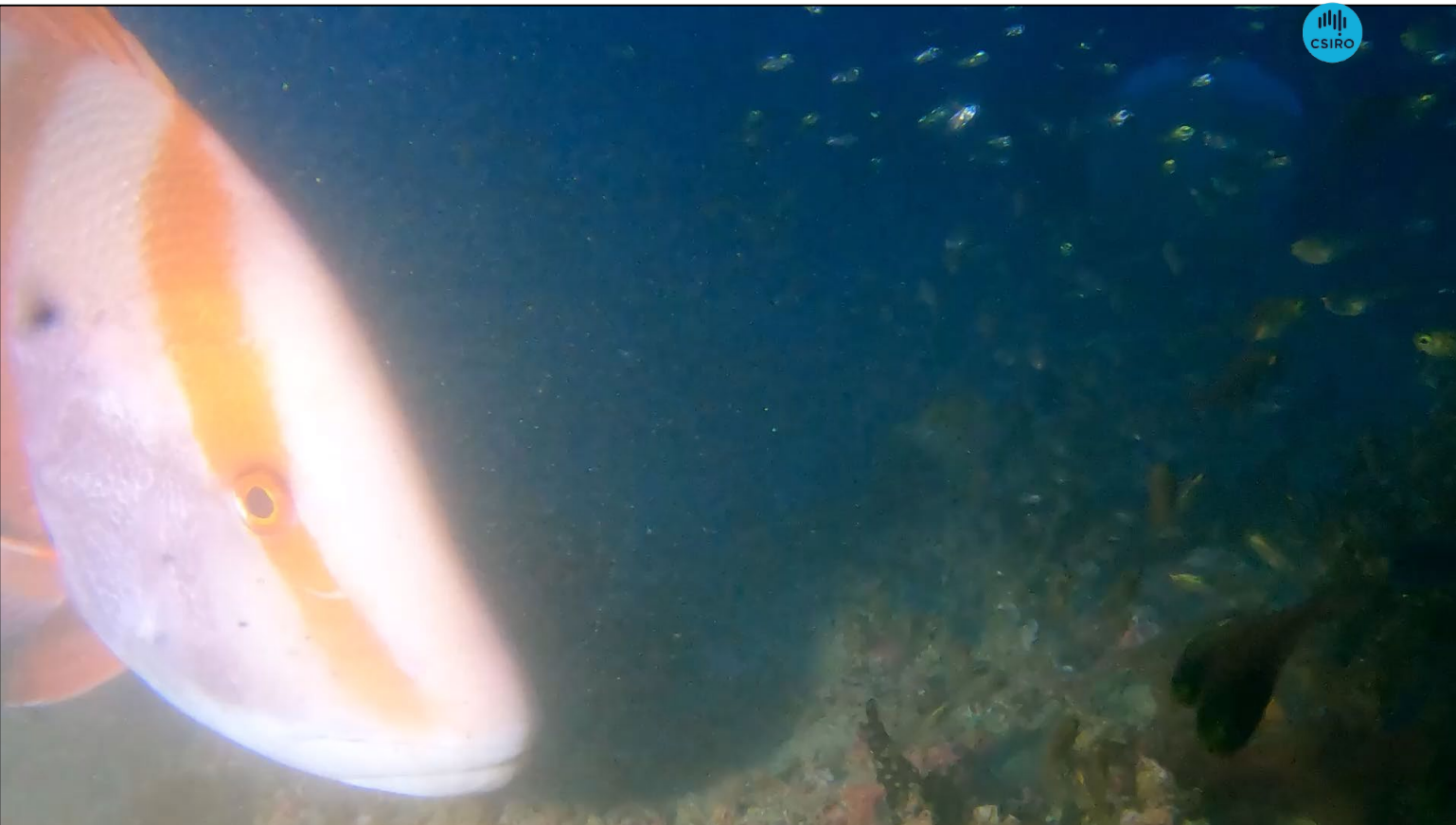


# Sponge 49m





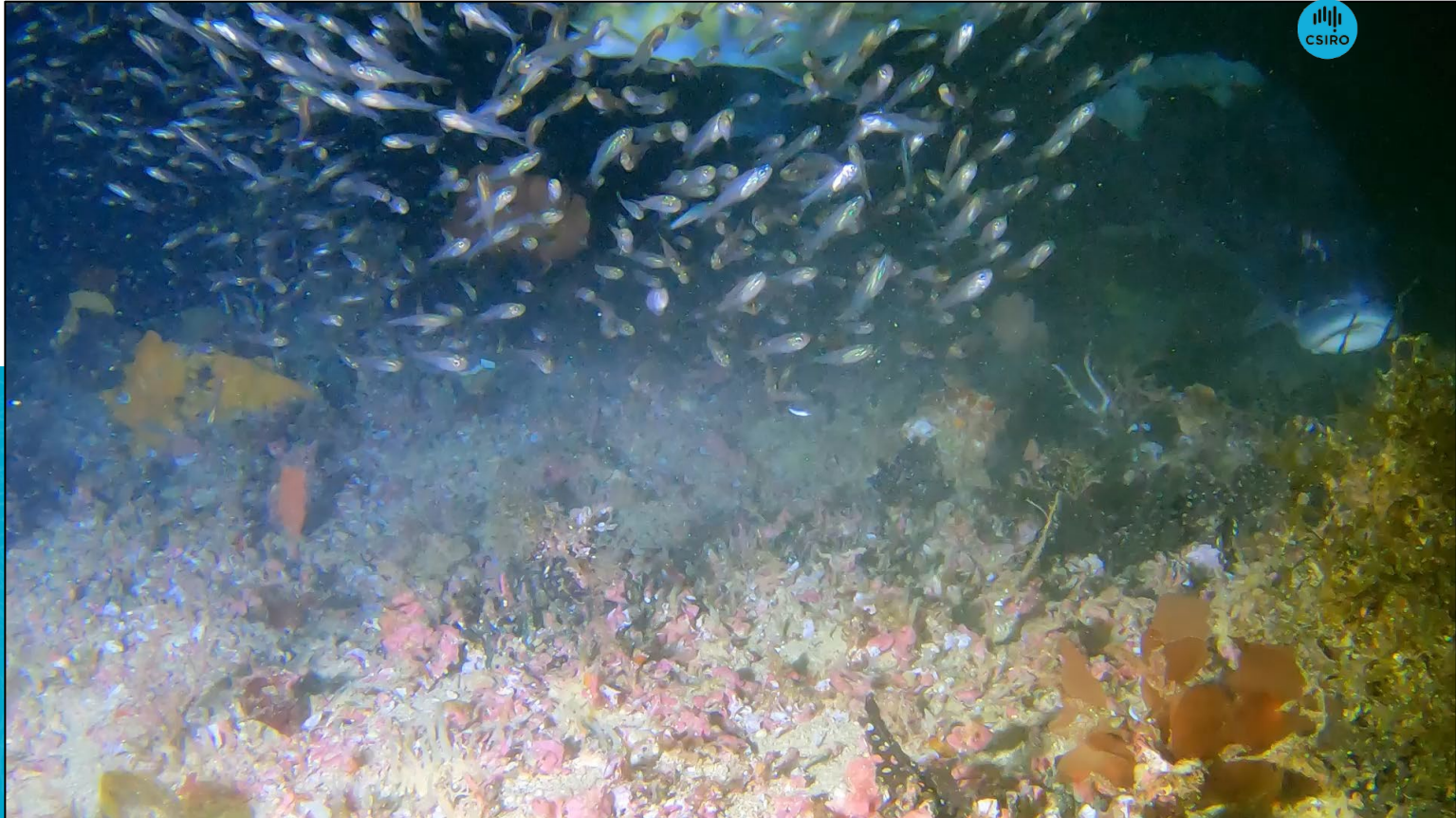
# Sponge 49m





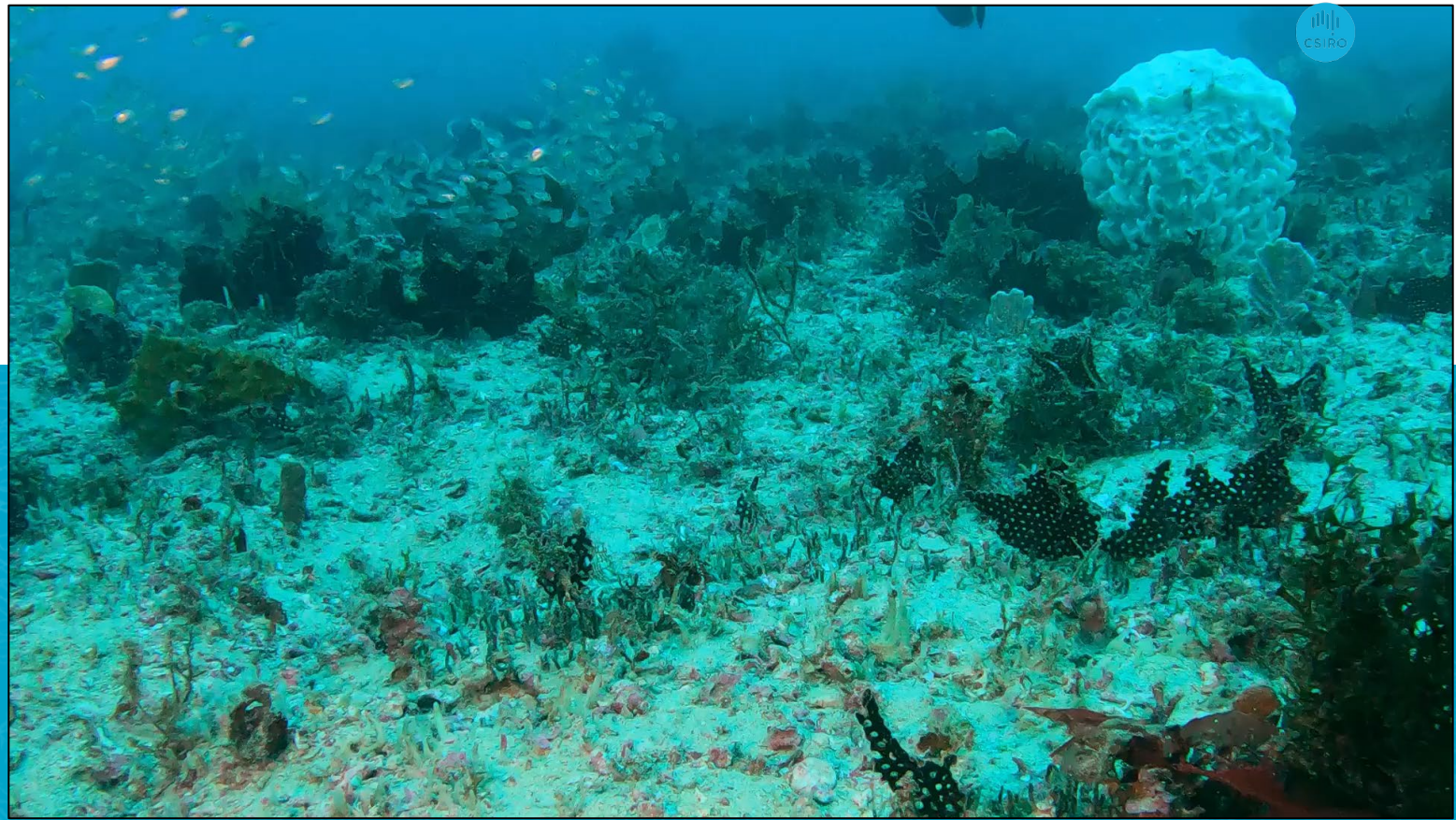


# Sponge 49m





# Sponge 49m





# Sponge 49m





# Rhodolith 41m



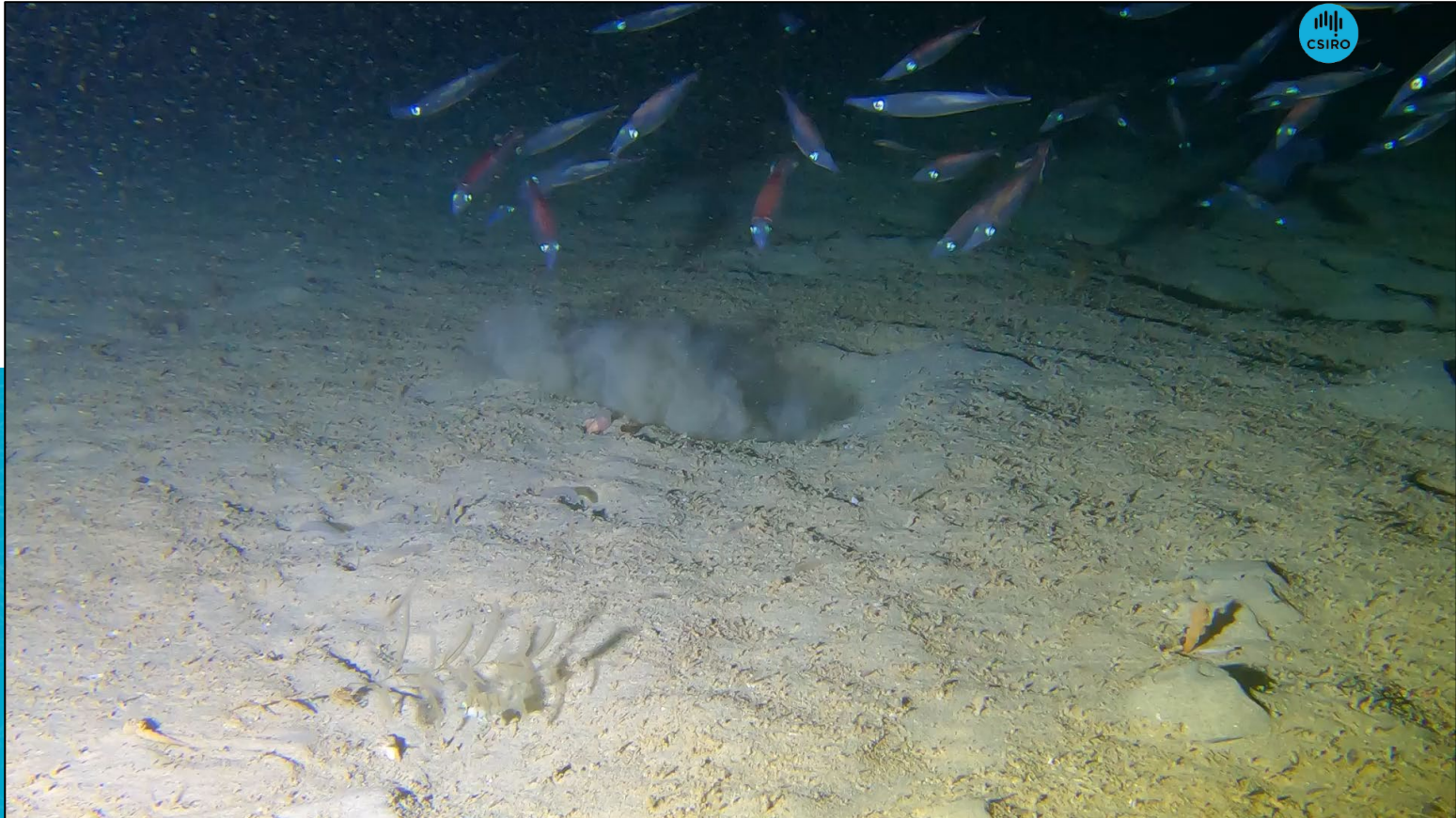


# Sand 50m





# Sand 50m



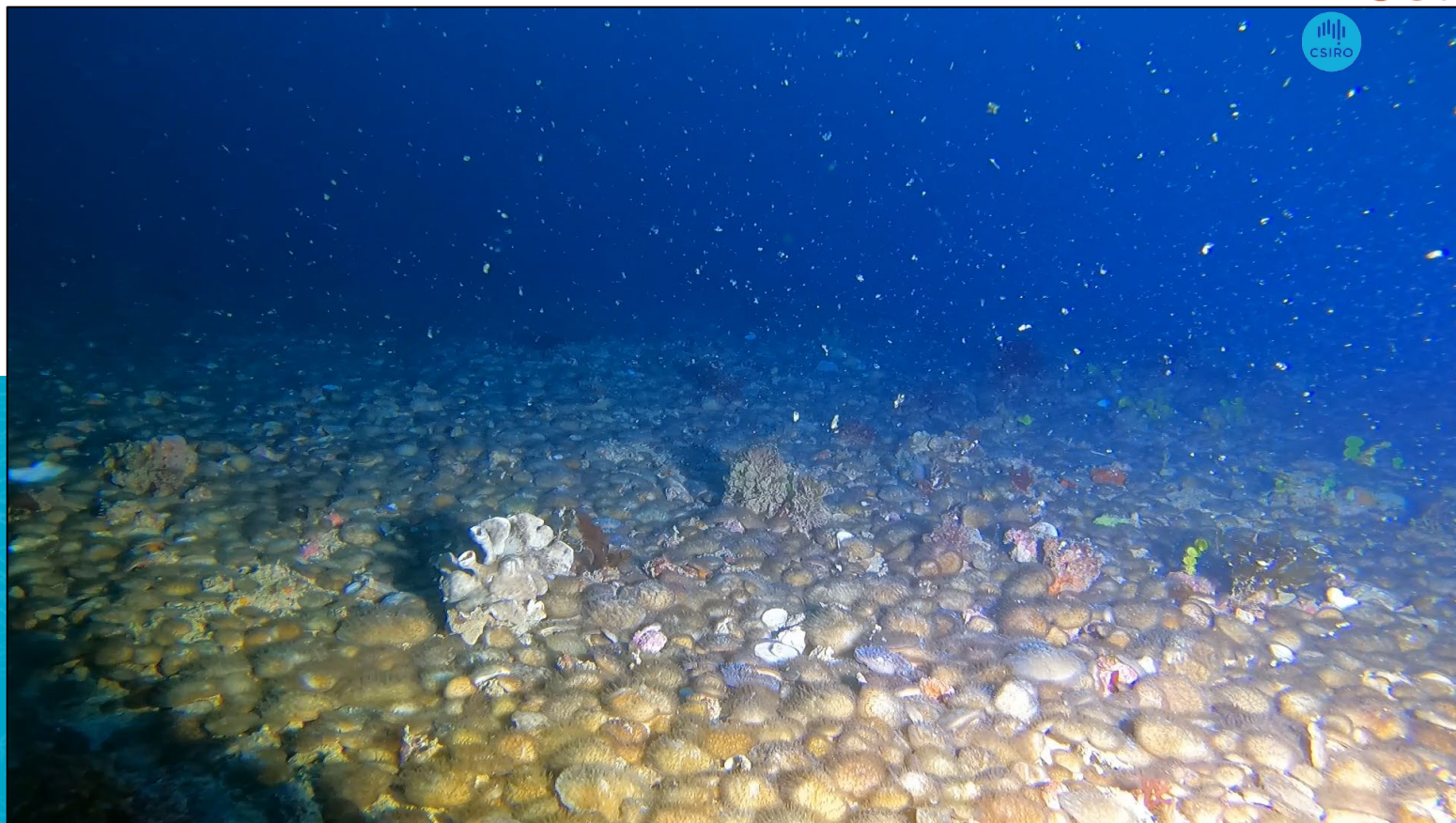


# Sand 50m





# Cycloseris 38m







# Rhodolith rubble 42m





# Thank you

## **Environment**

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