



## North West Shoals to Shore Research Program

Pearl Oyster Habitat and Connectivity in the Eighty Mile Beach Region

### **Karen Miller**

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AIMS: Australia's tropical marine research agency.

Karen Miller, Iain Parnum, Marji Puotinen, Luke Thomas, Mary Wakeford, Steve Whalan



### Pearl Oyster Habitat and Connectivity in the Eighty Mile Beach region

### Background

- *Pinctada maxima* fishery focussed on Eighty Mile Beach area near Broome
- Most fishing in 15-35m depth zone
- Thought to be populations deeper than 35m
- Role of deep populations as brood stock for fishery?

#### Goals

- 1. Establish distribution and abundance offshore from Eighty Mile Beach
- 2. Determine preferred habitat of pearl oysters
- 3. Understand connectivity deep  $\rightarrow$  shallow





### 120°E 121°E Where is Pearl Oyster Habitat? Multi-beam tracks SOL7152 SOL7083 SOL6920 **Field sampling methods** 18°S Three voyages on RV Solander (40-100m depth) ٠ 5000km (862km<sup>2</sup>) of multibeam sonar to map seafloor ٠ Multibeam backscatter for seabed hardness • 119 towed video transects to characterise benthic communities ٠ 35 benthic sleds for collections and ground-truthing ٠ 85 sediment grabs for grain size analysis ٠ 19°S-100 km



# Australian Government



### What species are associated with Pearl Oyster Habitat?

60





## Predicting where oysters occur...

- Two models, 120 potential predictors
- First predicted "sparse filter feeders" (moderate classification accuracy (kappa = 0.59)
- Second predicted presence/absence of oysters (low accuracy (kappa = 0.2)
- Oysters associated with sparse filter feeders and backscatter, but predictions poor ☺

| Hydro-acoustic<br>survey | Derive         | <u>STEP 2</u> :                               |
|--------------------------|----------------|---|
| 33                       | Predictor maps | Predicting the presence /                     |
| 1<br>Underwater          | 2              | absence of oysters                            |
| video survey             | 5              | 1 Filteres<br>(stry.e) Existence<br>class map |
| Identify<br>biota        | Training data  | ssification<br>ee model 6                     |
|                          | Testing data   |   |
| 2                        |                | Model 7 Presence /<br>absence of<br>oysters   |

| Habitat class         | % oysters |
|-----------------------|-----------|
| Sparse filter feeders | 54.3%     |
| Medium filter feeders | 21.1%     |
| Sparse sponge         | 10.6%     |
| Medium sponge         | 9.1%      |
| No biota detected     | 3.5%      |
| Medium whips          | 0.6%      |
| Sparse whips          | 0.6%      |
| Sparse gorgonians     | 0.6%      |





### Pearl Oysters in the Eighty Mile Beach region – what did we learn?

- Towed video effective tool for assessing large scale pearl oyster distributions esp. in deep water
- No evidence of extensive deep water oyster beds 90% of oysters occur in depths <40m
- Oysters occur most often in sandy, flat seabed where there are sparse filter feeder communities, and low frequency backscatter (buried hard substrate)
- BUT, there are many sandy, flat areas with sparse filter feeders where you don't find oysters so there is limited capacity to predict oyster habitats based on variables we measured











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### **Karen Miller**

k.miller@aims.gov.au +61 (8) 6369 4007

@aims\_gov\_au
@australianmarinescience
in

www.aims.gov.au waadmin@aims.gov.au +61 (8) 6369 4000