

Potential biological effects on deep water organisms from acute oil releases

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○ Coastal Ecosystems

LAYERS OF LIFE

The Gulf of Mexico's wealth of habitats make it one of the world's most ecologically and economically productive bodies of water. Oysters support a major fishery; sperm whales stalk giant squid; bioluminescent fish glow in the eternal night of abyssal canyons. Oil from the Deepwater Horizon spill has tested nature's resilience at every layer.

Click a layer name to view zone

<http://ngm.nationalgeographic.com>

○ Bright Surface

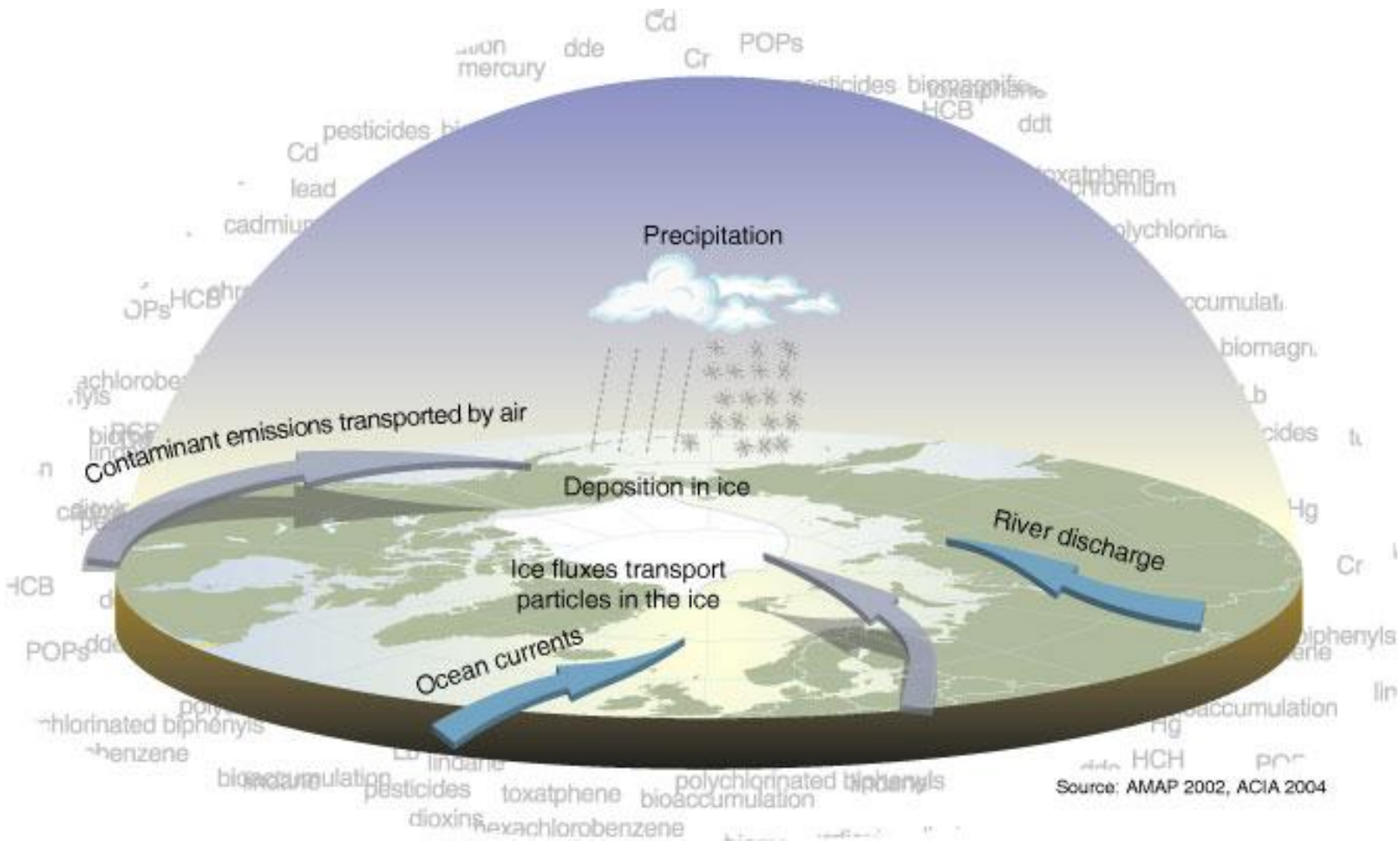
○ Twilight Zone

○ Dark and Teeming

“Mistakes are the portal of discovery”

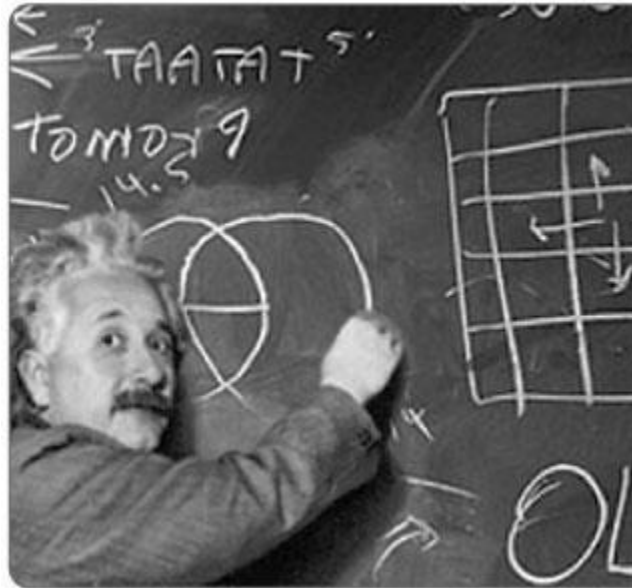
James Joyce (1882-1941), Irish author





Source: AMAP 2002, ACIA 2004





Offshore scientific cruises



Cold seep & hot vent communities



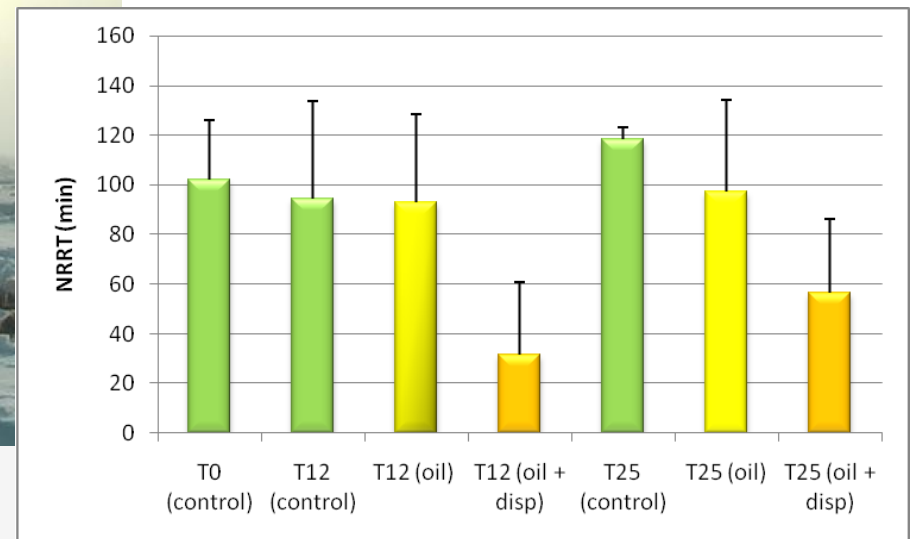
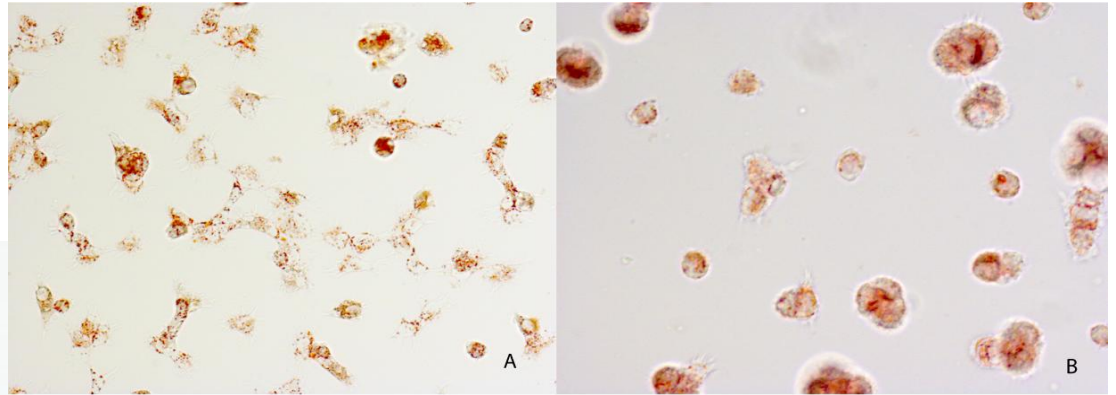
Baseline data - Reference

- Epifauna (Vøring Plateau)



Dispersants in Arctic waters

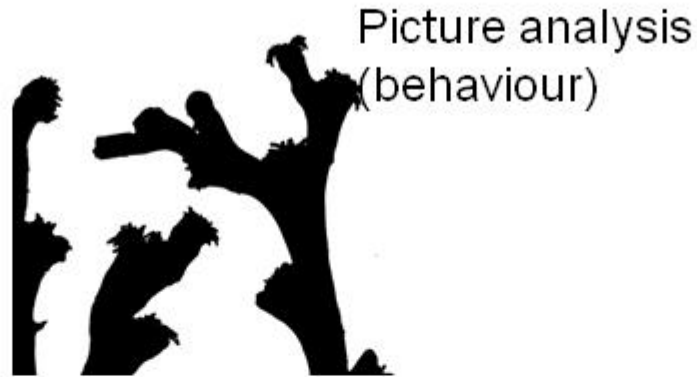
NFR project on bioavailability
as add-on to 'Oil in Ice' JIP



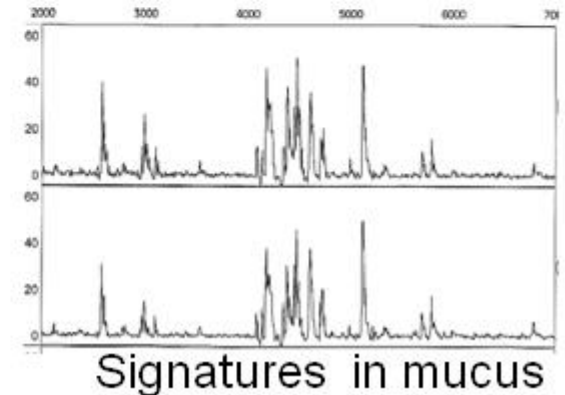
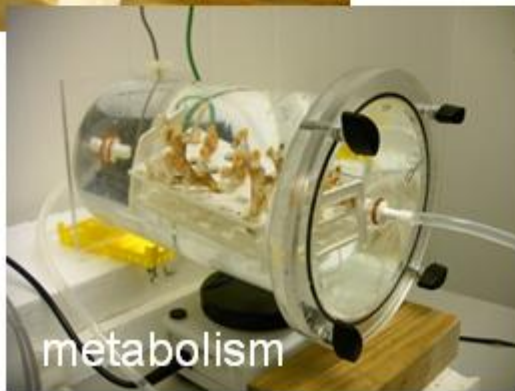
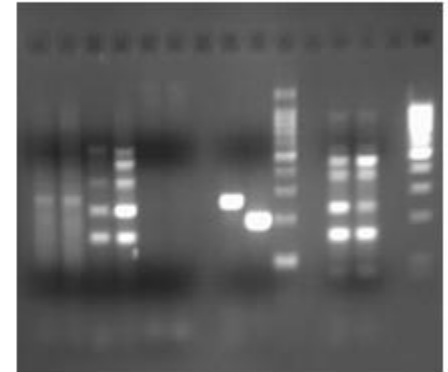
Laboratory studies



Searching for good diagnostic methodologies



Molecular tools



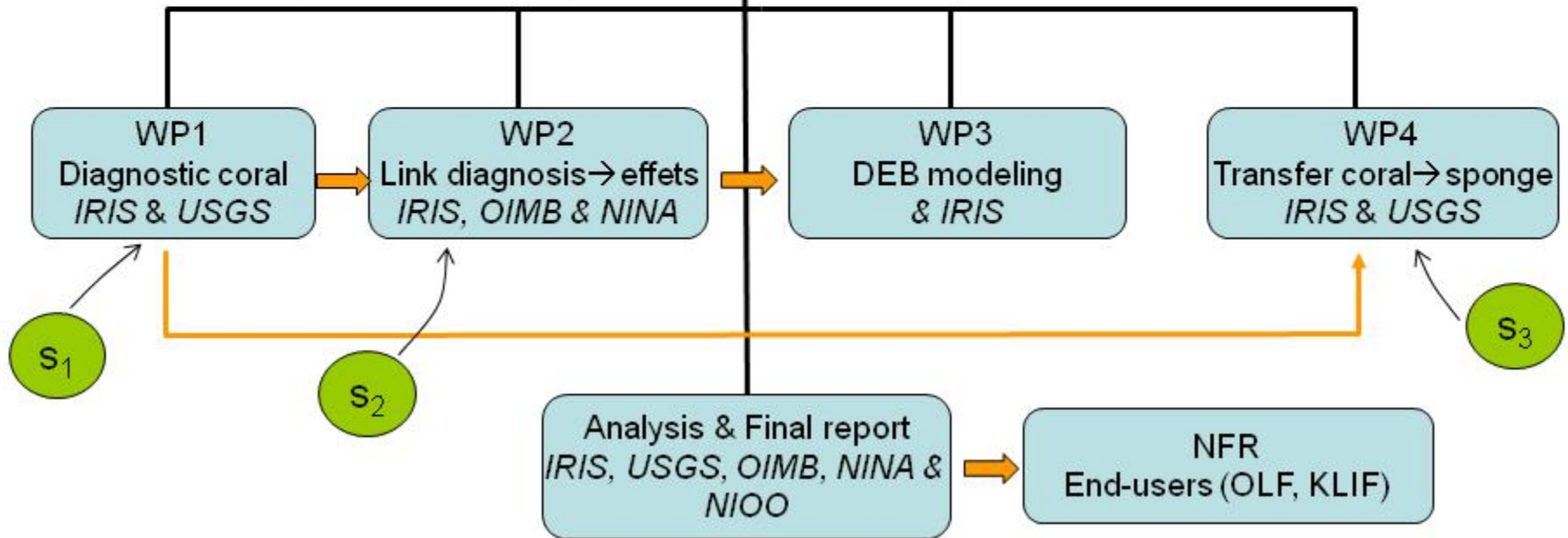
Diagnostics and health measures in corals and sponges



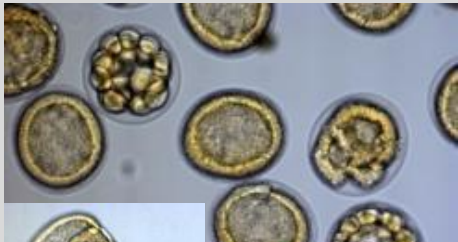
Project consortium
IRIS, USGS, OIMB, NINA, NIOO

Project lead *IRIS*

Project adm *IRIS*



The green sea urchin
Strongylocentrotus droebachiensis

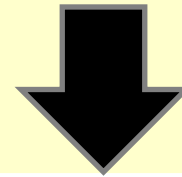


Aim:

Study how sea urchin early life stages respond to an oil spill when cultured at low pH



Stress 2: Oil spill

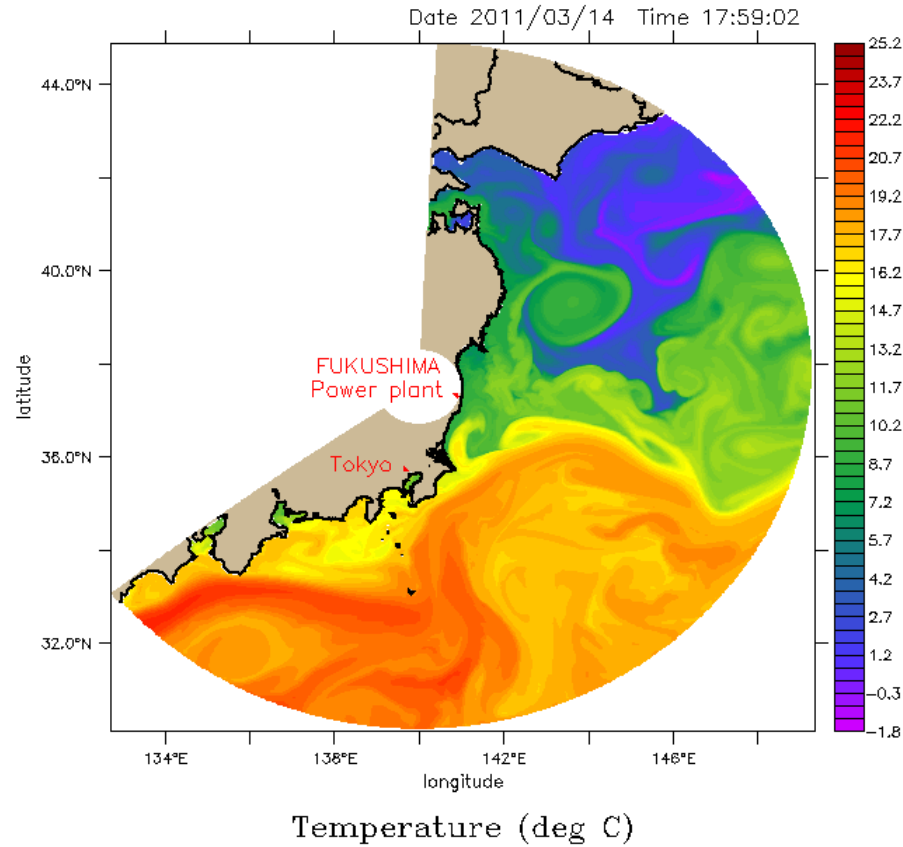


Stress 1: Ocean Acidification pH 7.6

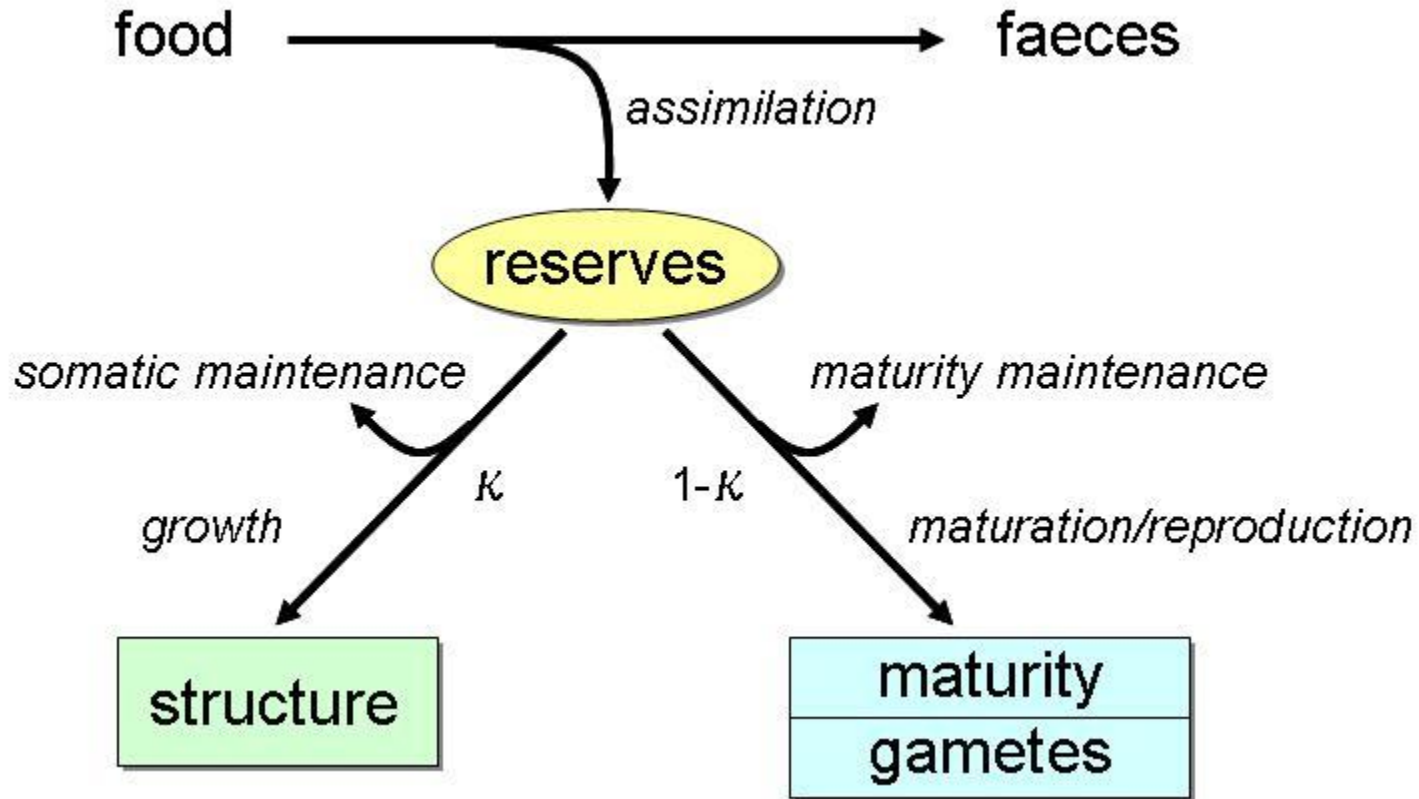
- Combined effects?

Modelling and integration

SIROCCO/OMP – Toulouse University – CNRS



DEBtox modelling



<http://cream-itn.eu>

Less locomotory activity

Bioluminescence

Slow growing

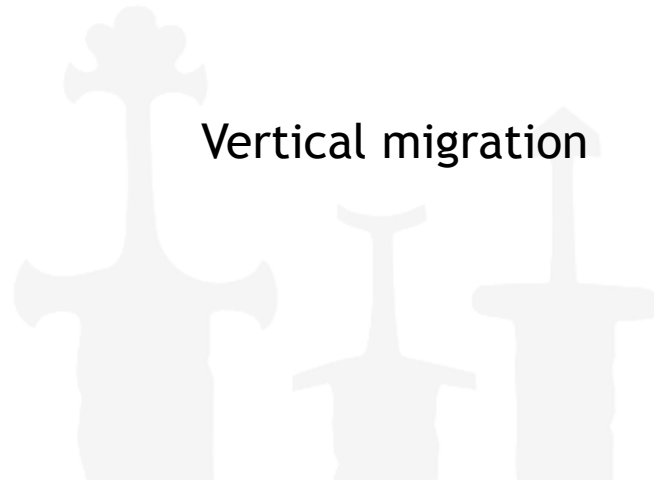
Characteristics of deep-sea fauna

Unique endemic species

Slow rates of energy expenditure

Special biochemical adaptations

Vertical migration



New light on oil toxicity and larvae development

- Short term exposure of fish larvae has been found to give serious late effects in developed adult fish (physiology and behaviour)
 - Significant reduced cardiac capacity
 - Several other secondary effects

