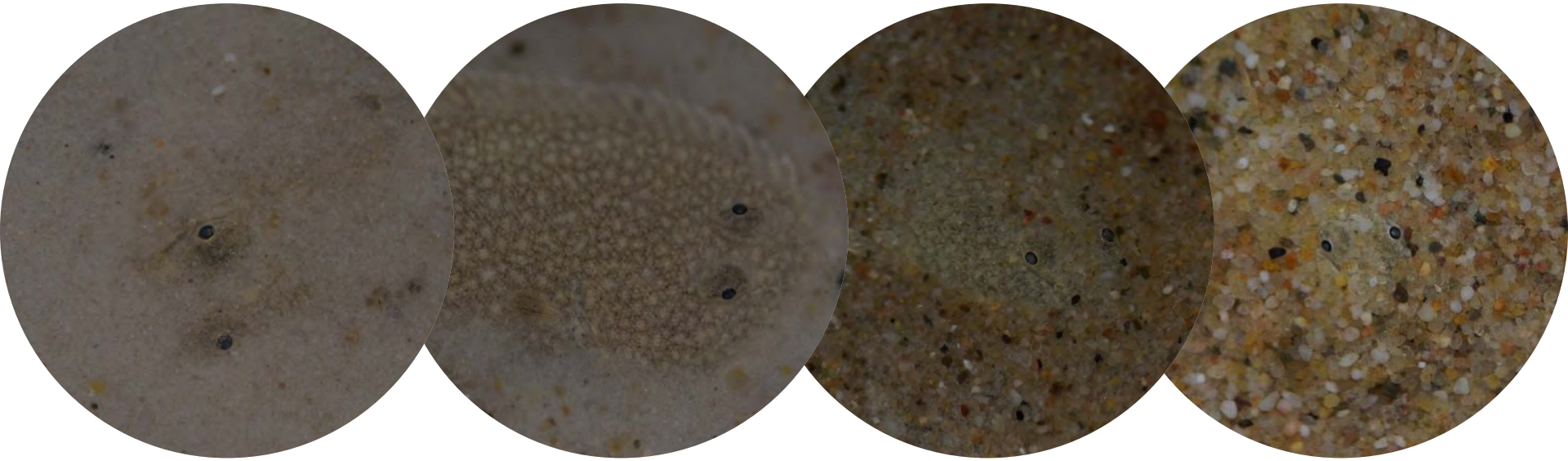
Sediment preference of juvenile flatfish

Marjolein Post



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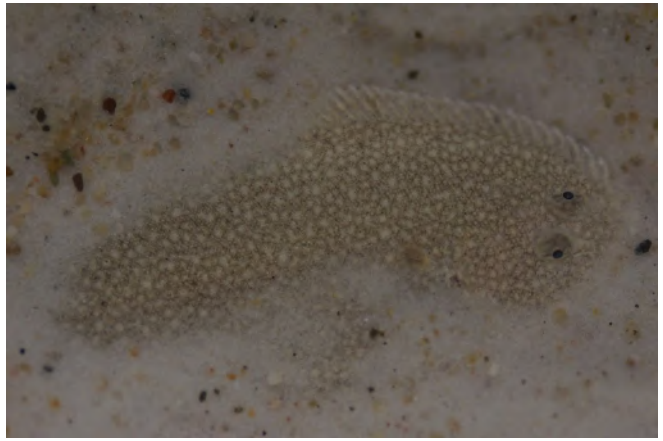
Introduction

- Coastal sea is an important flatfish nursery
- Increase in sand nourishments
- Direct effect on nursery habitat



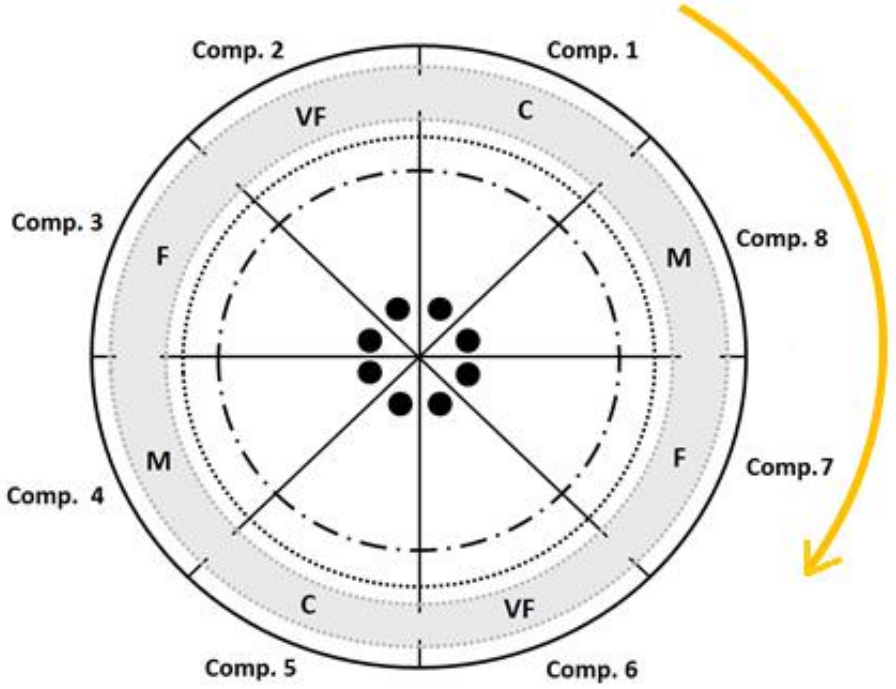
How is sediment affecting juvenile flatfish?

Juvenile habitat preference

- Shallow depths
  - Higher temperature
- Shelter
  - Lower predation pressure
- Fine sediments
  - Burial and food abundance

Innate sediment preference

- Sediment preference of juvenile sole
  - Circular preference chamber with 4 sediment types
  - Two temperature regimes
  - Settlement size (41 mm-92 mm)



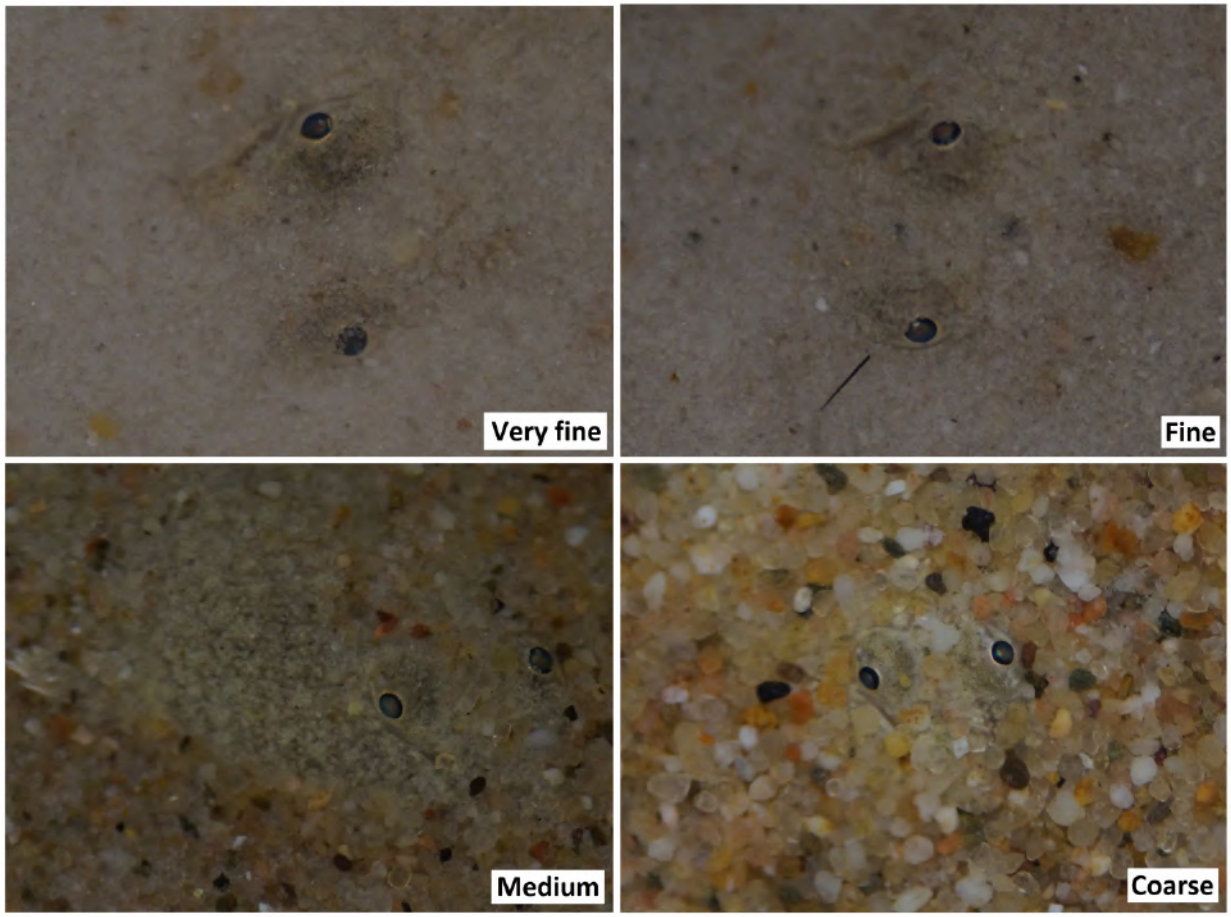
Sediment grain sizes

Very fine sand (63-125 µm)

Fine sand (125-250 µm)

Medium sand (250-500 µm)

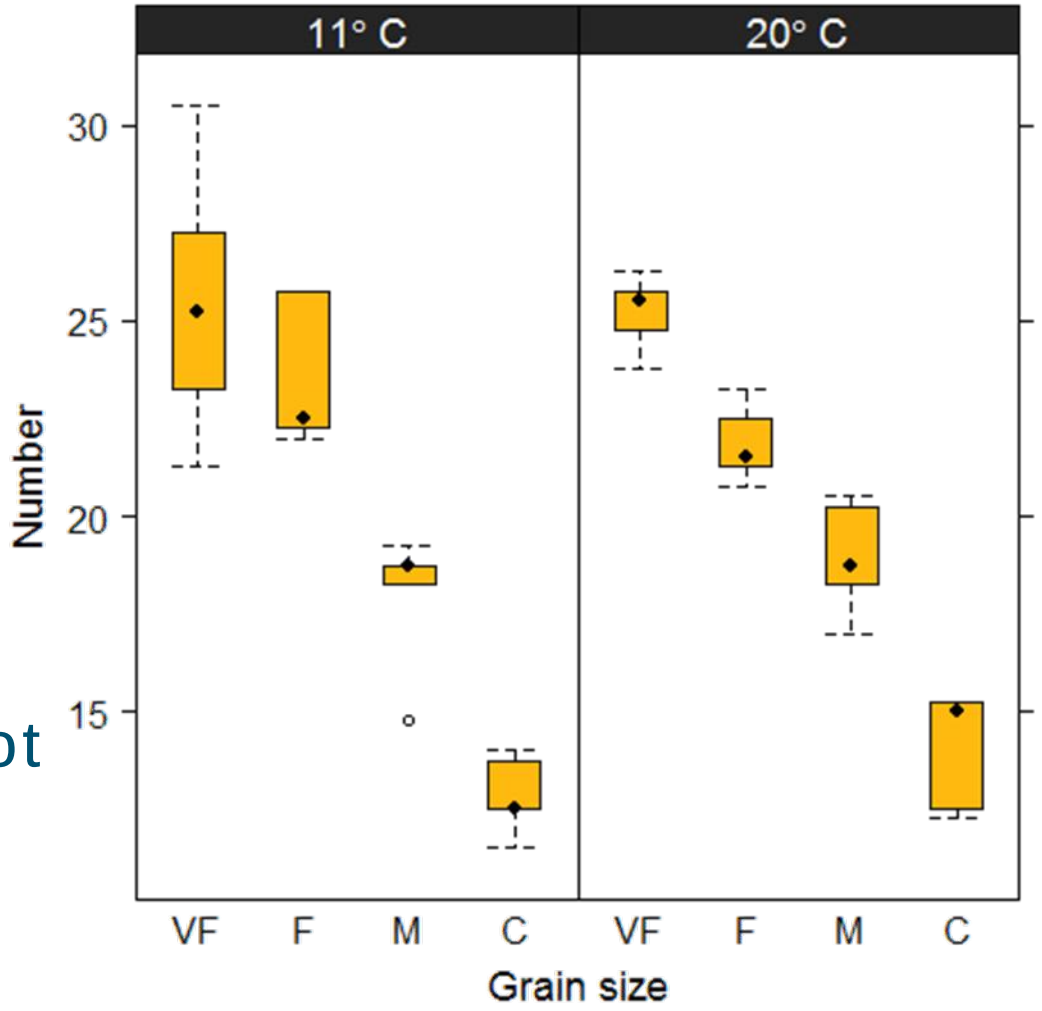
Coarse sand (500-1000 µm)



Sediment preference

- Overall significant sediment preference for finer sediments
- No temperature effect

Food availability not included



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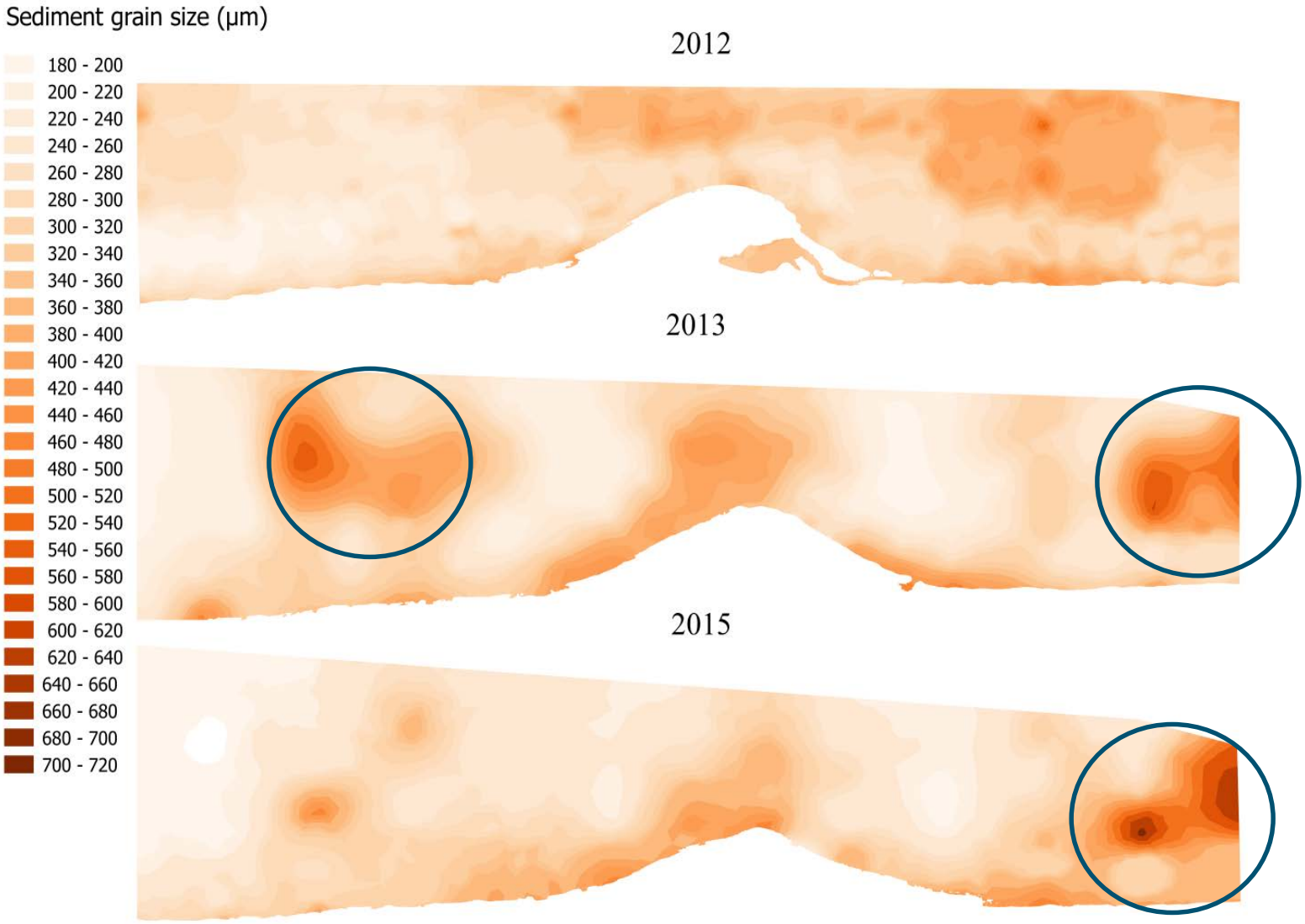
Sediment preference in the field

- Sediment coarsening around the Sand Engine



Methods

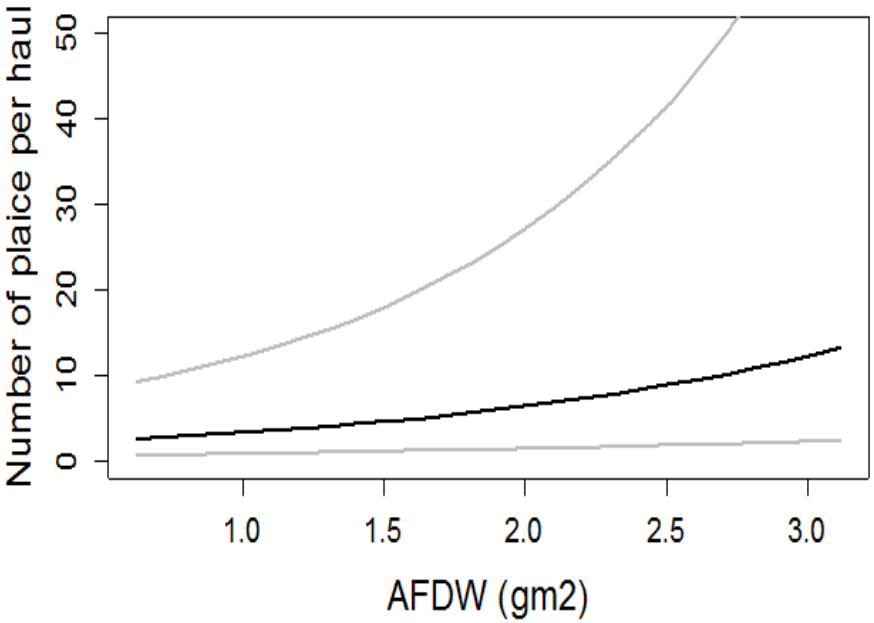
- 0-group plaice and sole
- Fish sampling season

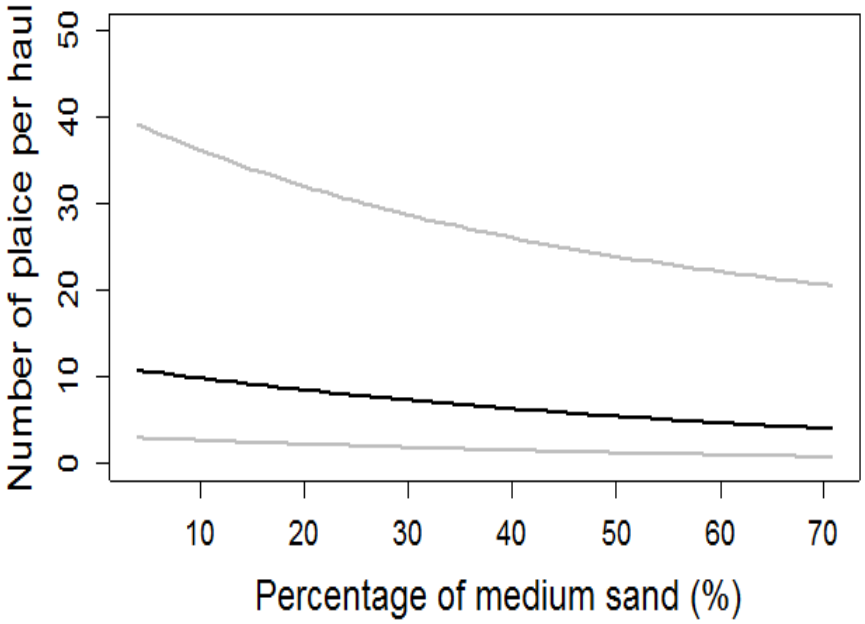
  2012: August/September
  2013: October

  2015: October
- Selected prey species based on diet studies
- Percentage of medium sand (250-500µm)
- Depth
- Statistics
  - Zero inflated glmm's

Juvenile plaice

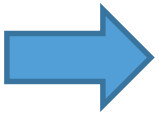
- Increased abundance with higher prey biomass
  - Also related to juvenile sole abundance
- Negative relation with medium sand





Discussion

- Sediment coarsening
  - Related to a decreasing abundance of plaice
  - Grain size of the Dutch coast went from 210 µm to 320 µm
- Sediment colour
- Local variability in prey biomass
  - Associated with sediment type
  - Related to juvenile plaice and sole abundance



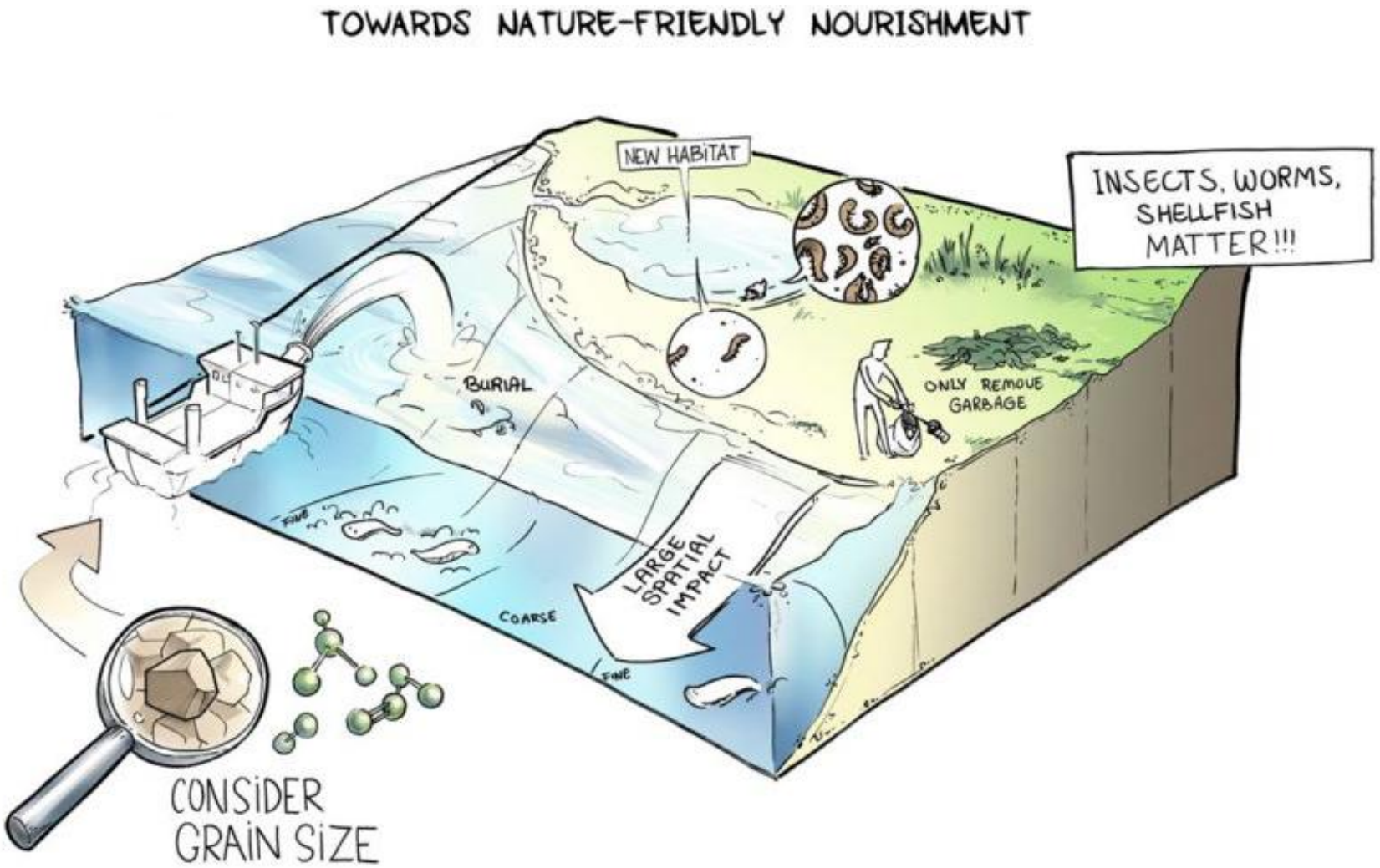
Mismatch in sediment type could hamper the recovery of benthic prey species

Sediment mismatch during nourishment

- Coarser sediments could delay the recovery of the benthic community after an event
  - Seasonal timing of nourishment
  - Recruitment season of benthos

- Starvation could inhibit juvenile flatfish growth
  - Smaller fish
    - DEB model
    - Consequences for recruitment and survival

Thank you!



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