

Ontogenetic vertical “migration” in coral-reef fish larvae communities and its consequences for dispersal

Jean-Olivier Irisson

Claire B. Paris

Robert K. Cowen

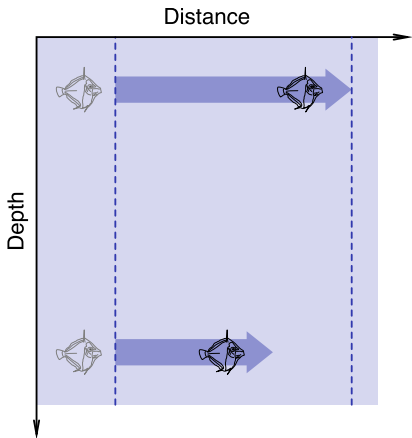
Serge Planes

Centre de Biologie et d'Écologie Tropicale et Méditerranéenne,
Université de Perpignan

Rosenstiel School of Marine and Atmospheric Sciences,
University of Miami

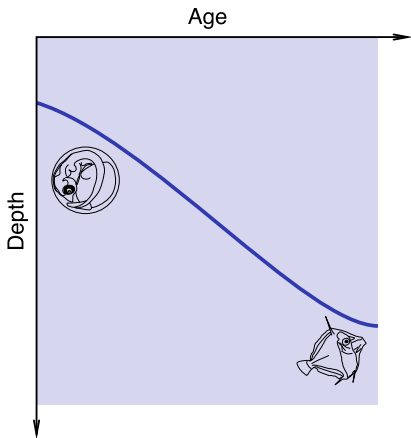
30 Janvier 2009

Impact of vertical position



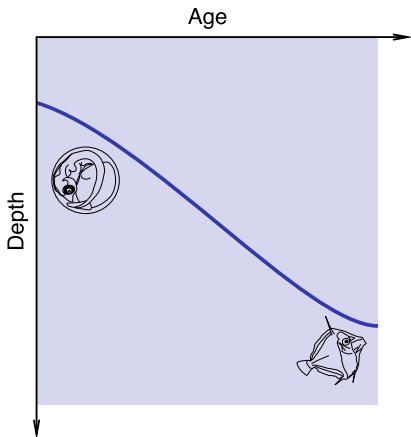
- Current **shear**
- Many **models**
- Little **data**

Impact of vertical position



- Current **shear**
- Many **models**
- Little **data**

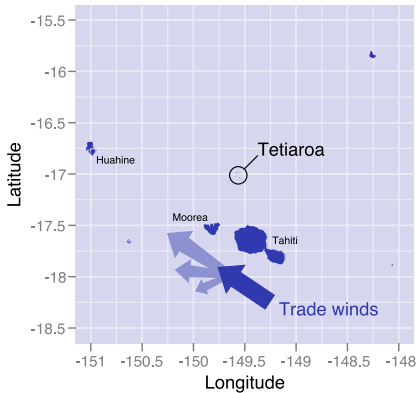
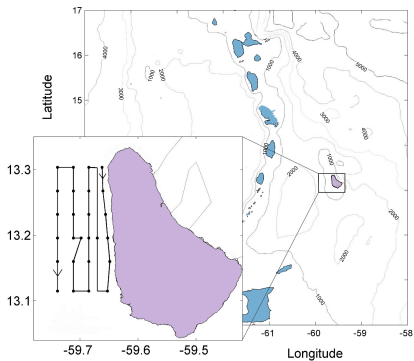
Impact of vertical position



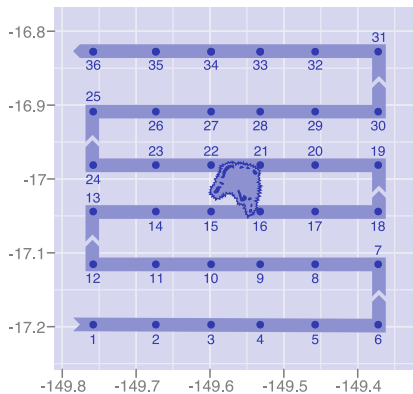
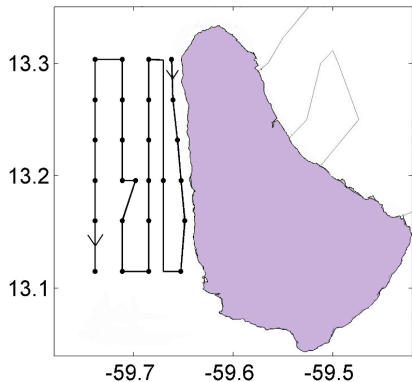
- Current **shear**
- Many **models**
- Little **data**



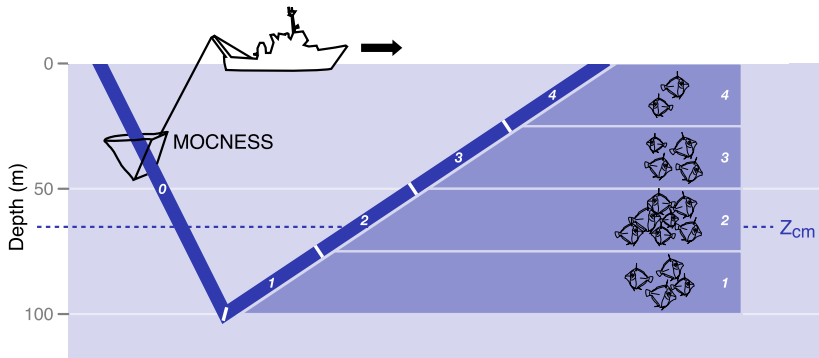
Two similar field studies



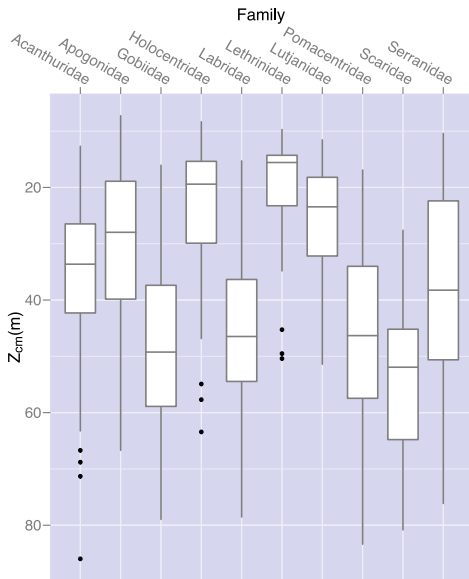
Two similar field studies



Vertically stratified sampling

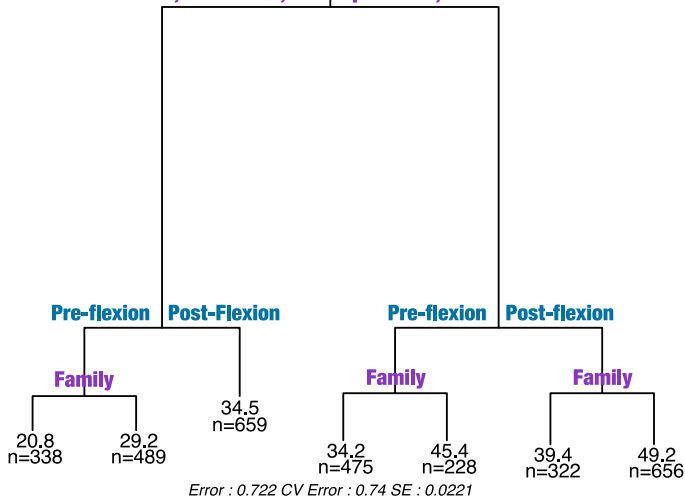


Large taxonomic variations



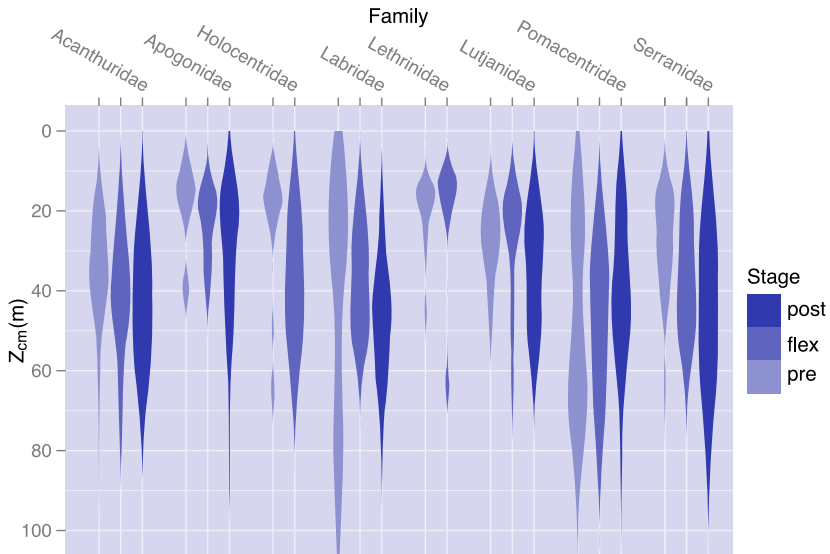
Large taxonomic variations

**Apogonidae, Bleniidae, Bothidae, Gobiidae,
Labridae, Hemulidae, etc. Ophidiidae, etc.**



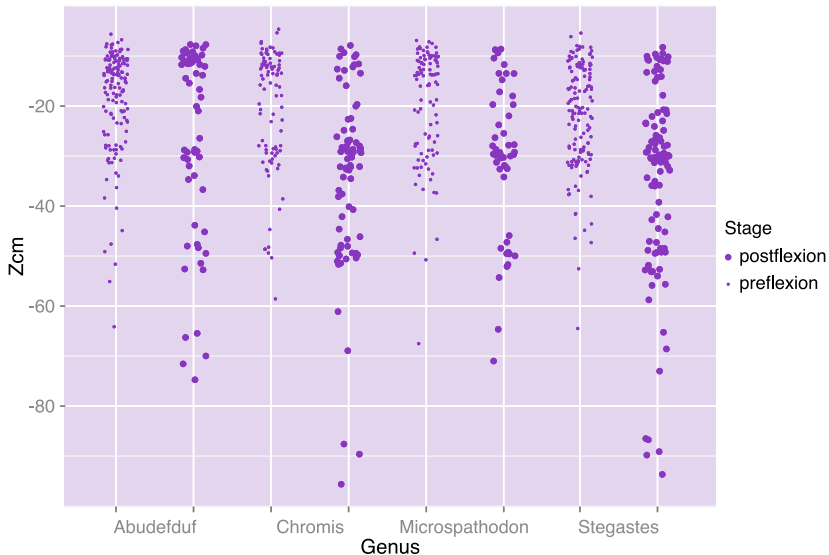


Ontogenetic effect within taxon



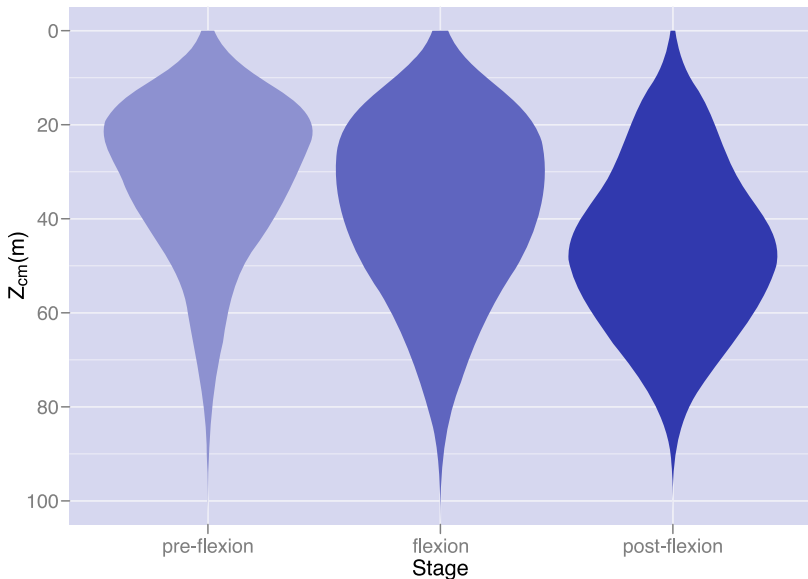


Ontogenetic effect within taxon



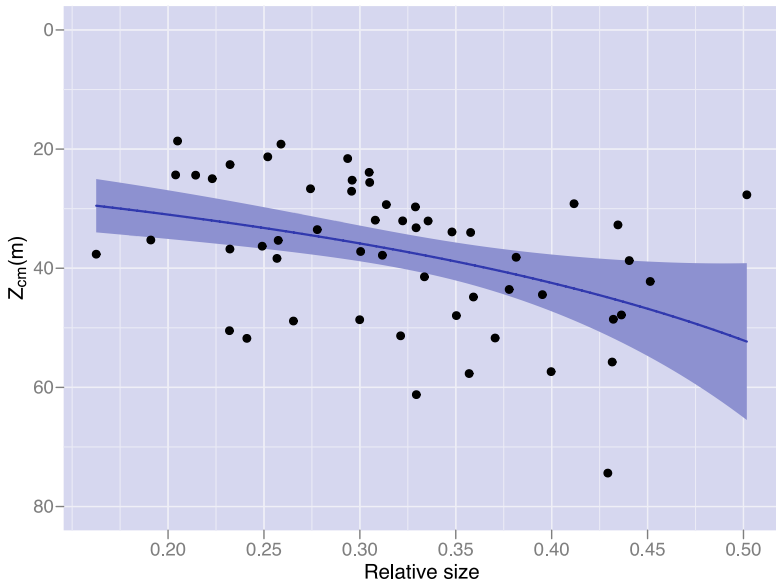


Homogenous across taxa





Homogenous across taxa



Vertical Migration



Observations



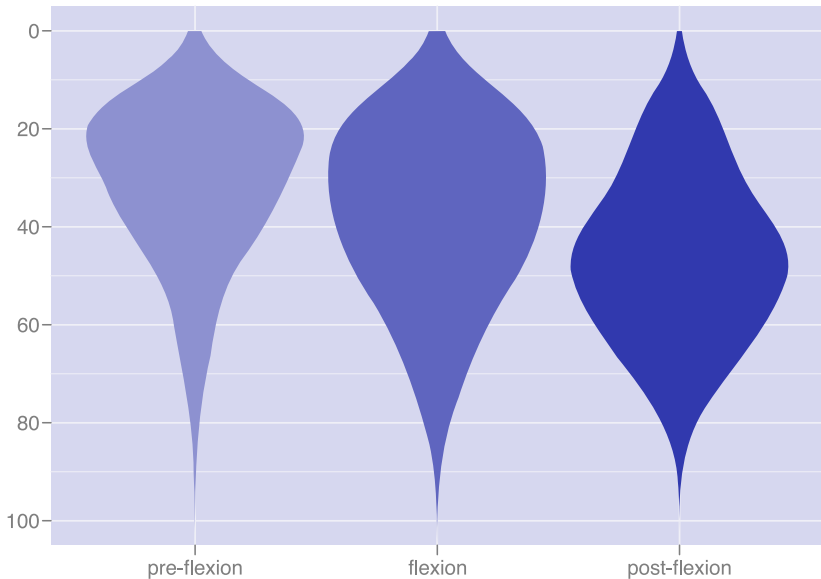
Modelling



Implications

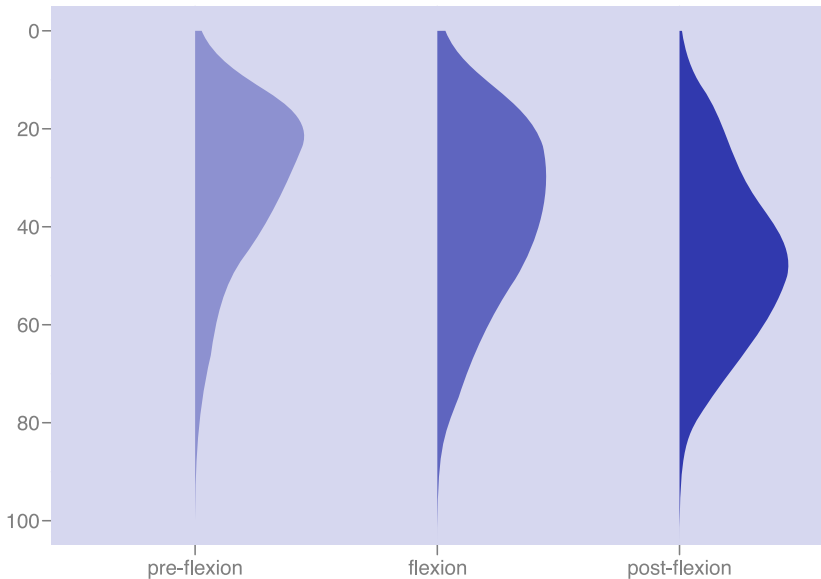


Realistic vertical distributions



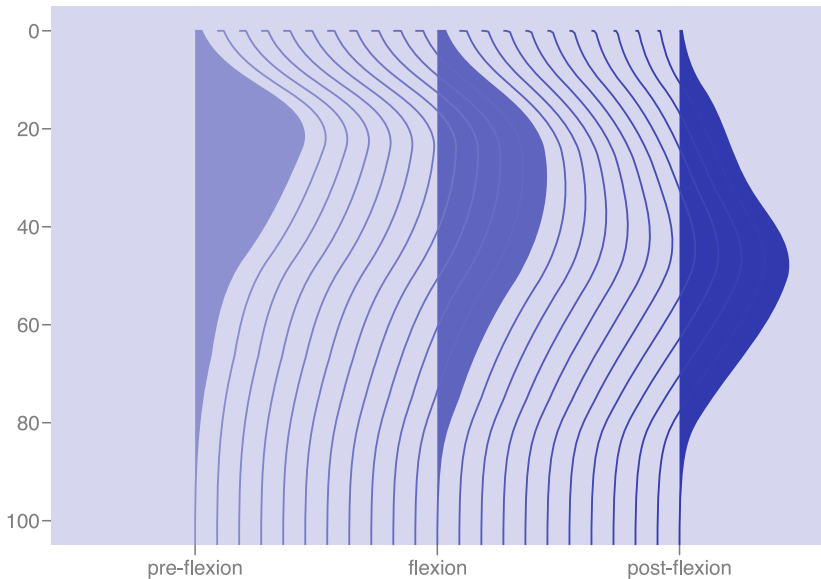


Realistic vertical distributions



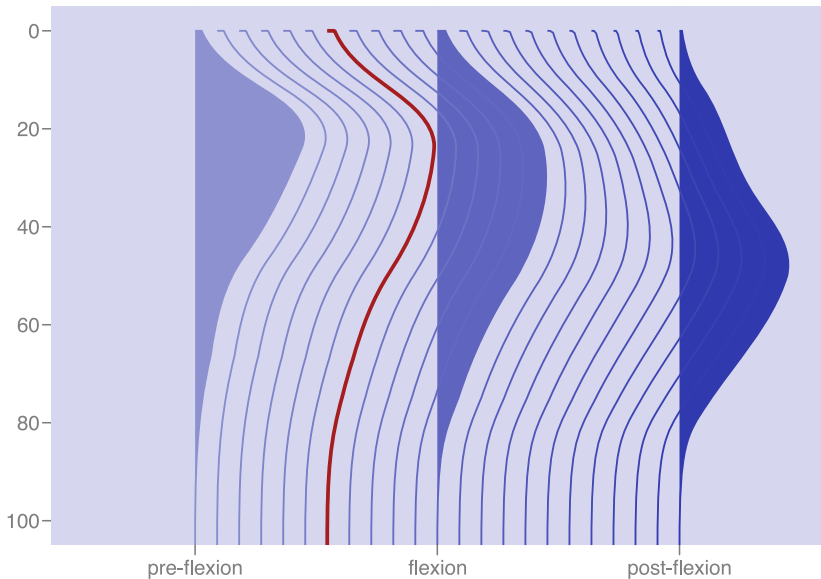


Realistic vertical distributions



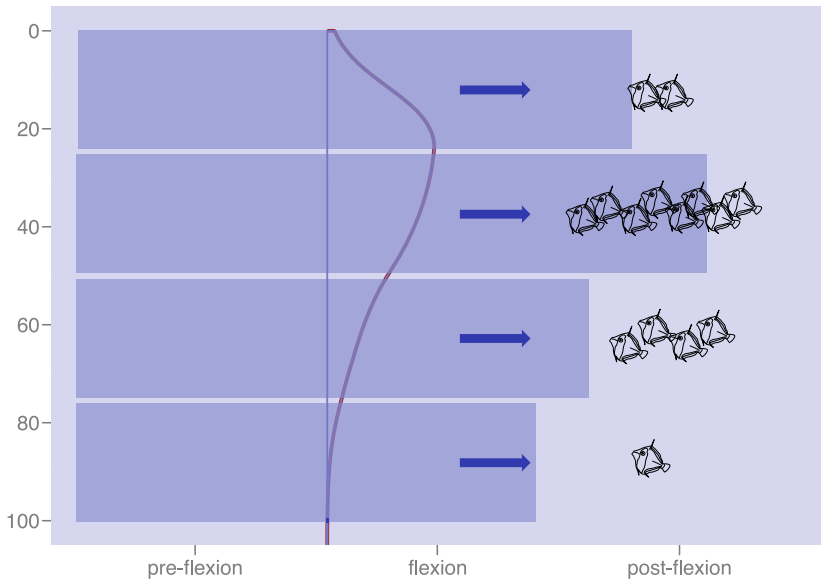


Realistic vertical distributions

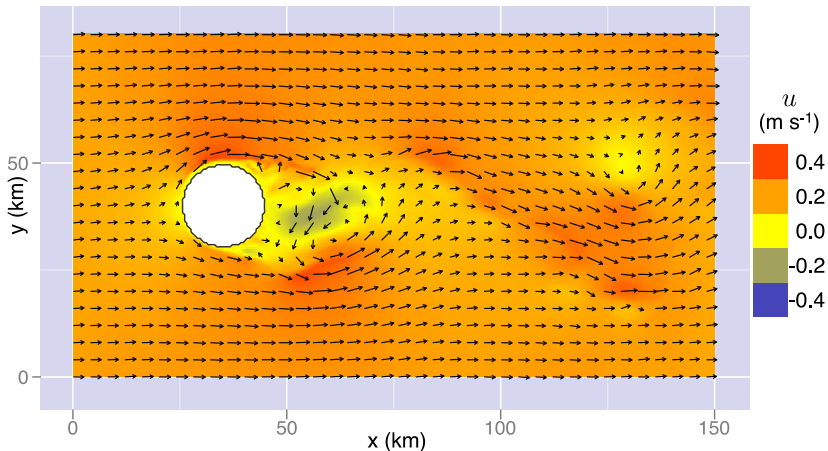




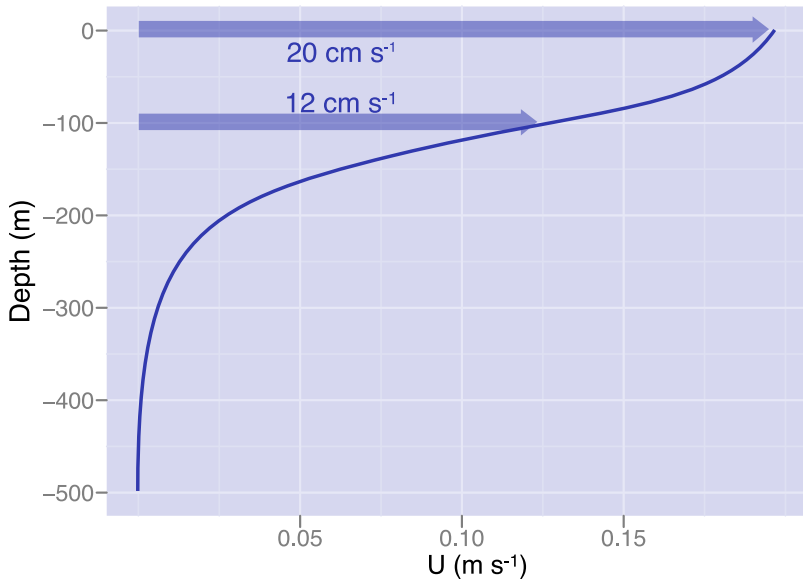
Realistic vertical distributions



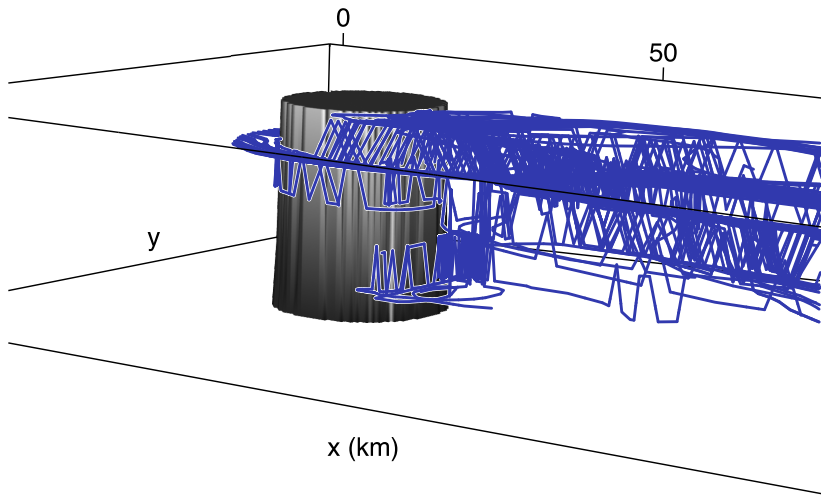
Embedded within a simulated flow field



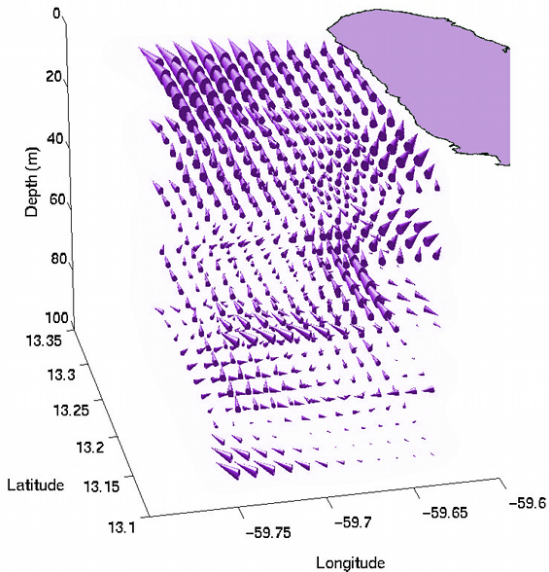
Embedded within a simulated flow field



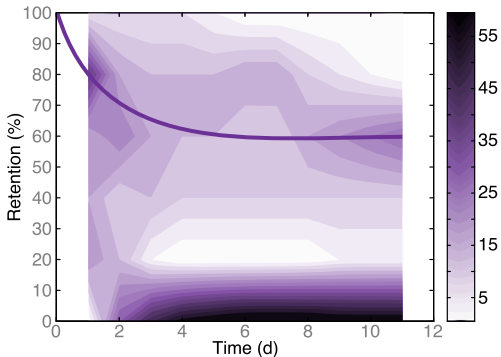
Little difference on trajectories



Interpolation of current field

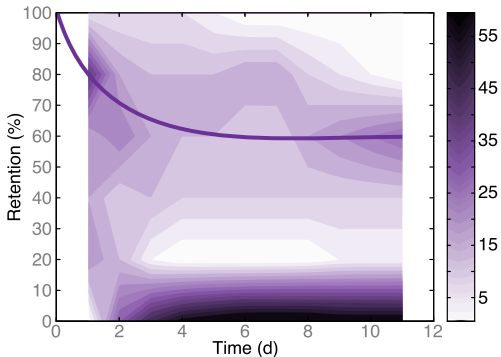


Retention rate



- **Bimodal** distribution of retention
- Depends on **initial** flow conditions
- Vertical migration is **effective**

Retention rate



- **Bimodal** distribution of retention
- Depends on **initial** flow conditions
- Vertical migration is **effective**

Importance of rare events



- **No** large scale, **systematic** influence
- **Extraordinary** cases of retention

What is important? Mean or tails?

Importance of rare events



- **No** large scale, **systematic** influence
- **Extraordinary** cases of retention

What is important? Mean or tails?

Importance of rare events



- **No** large scale, **systematic** influence
- **Extraordinary** cases of retention

What is important? Mean or tails?