Predictive dispersal: Lagrangian modelling using knowledge on larval dispersal

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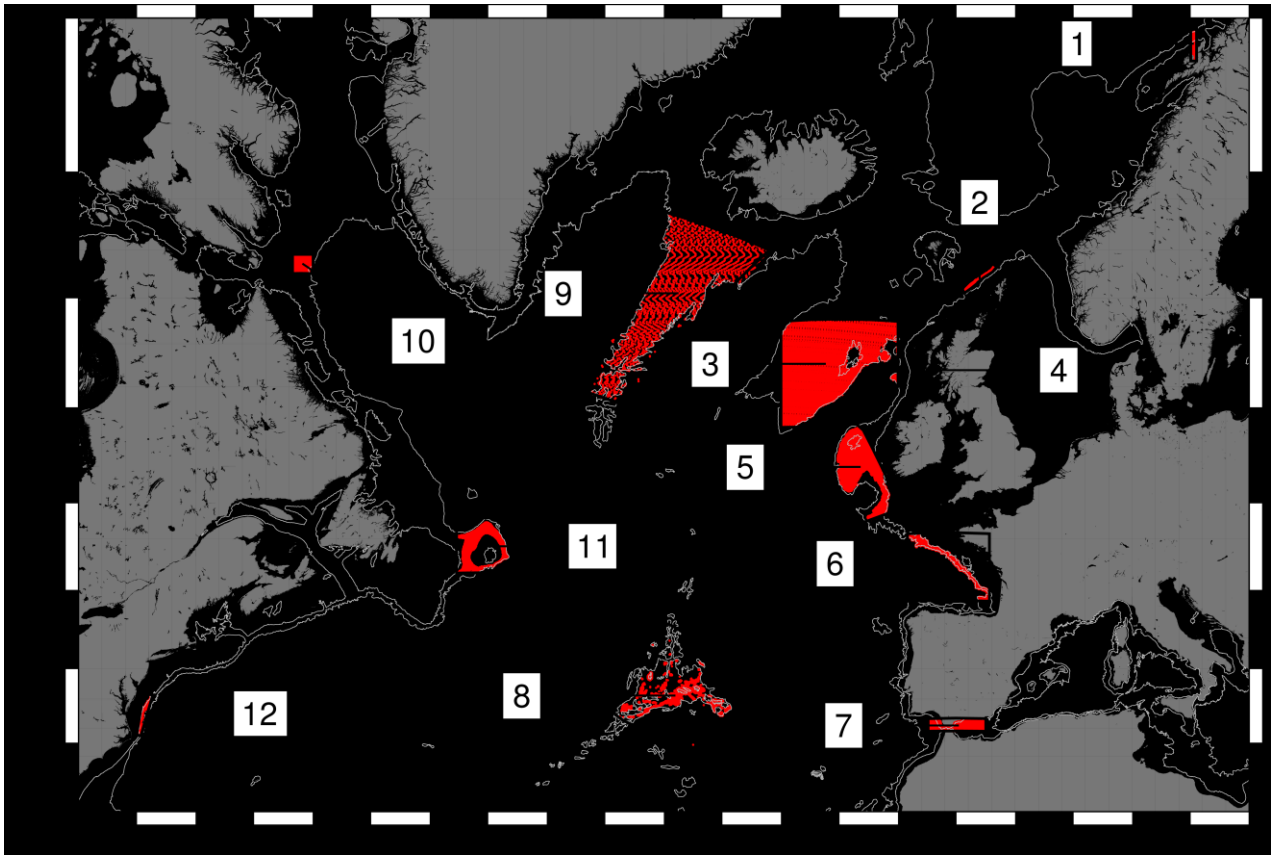
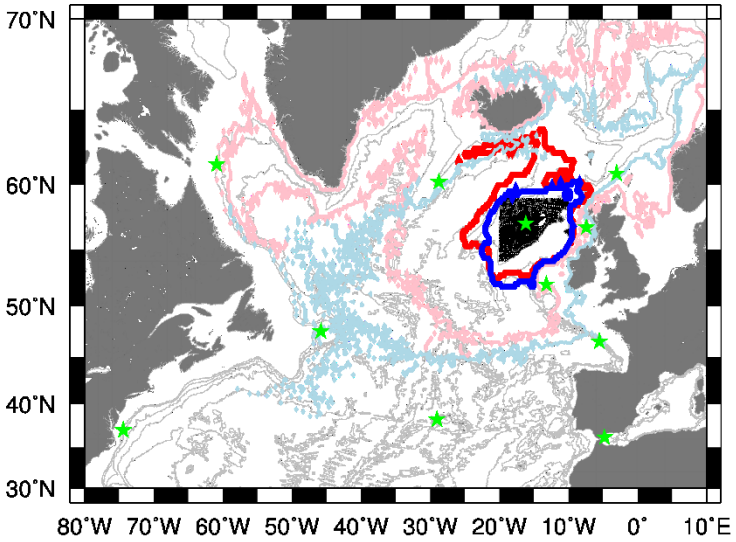
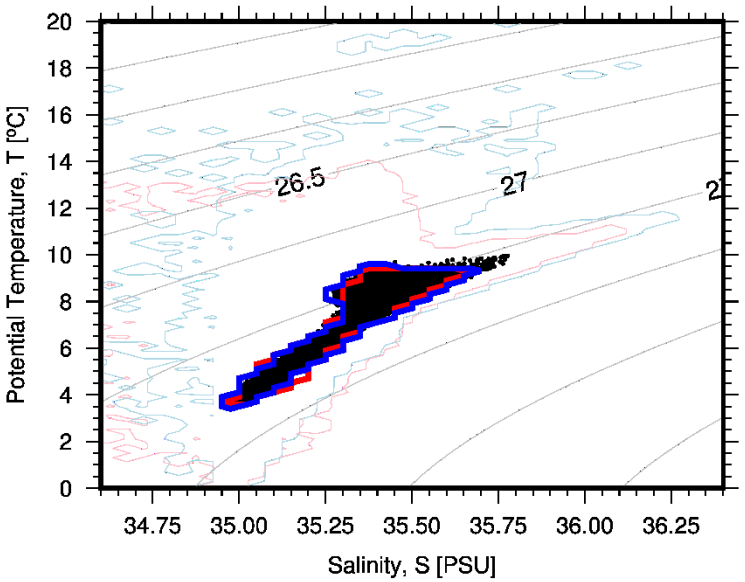
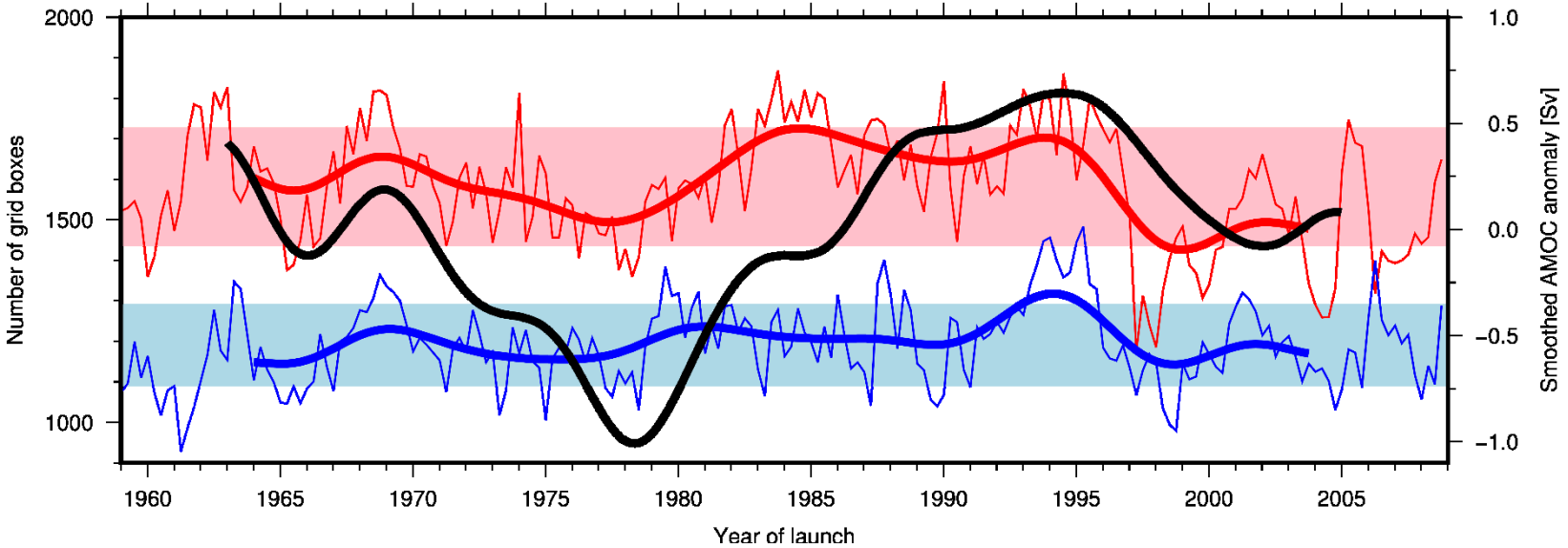
Modelled larval tracks from Case Study sites



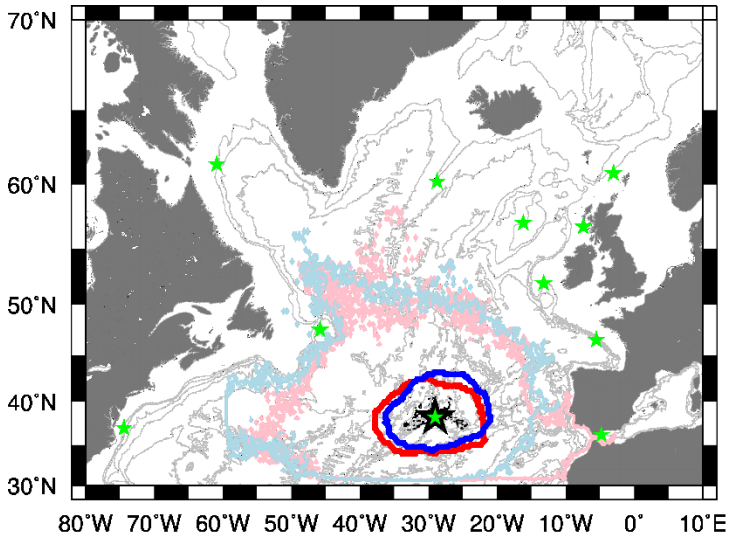
Rockall bank. Passive particles. 1-year tracks. Releases over 50 years.

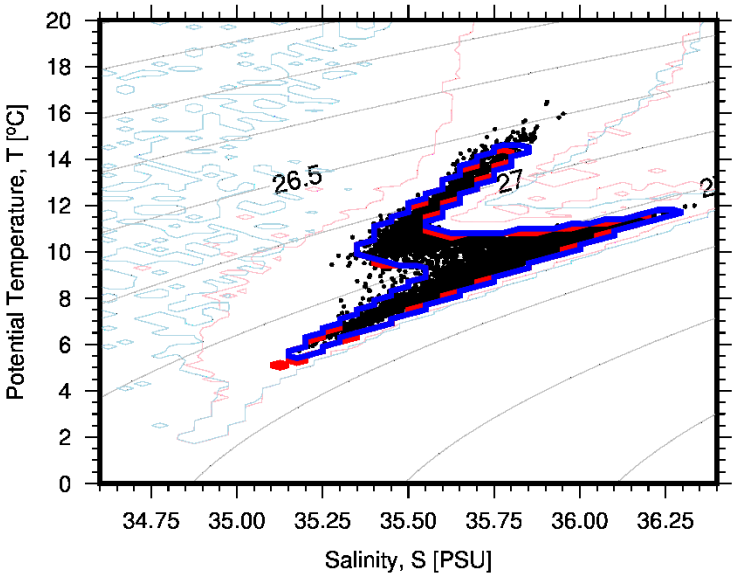


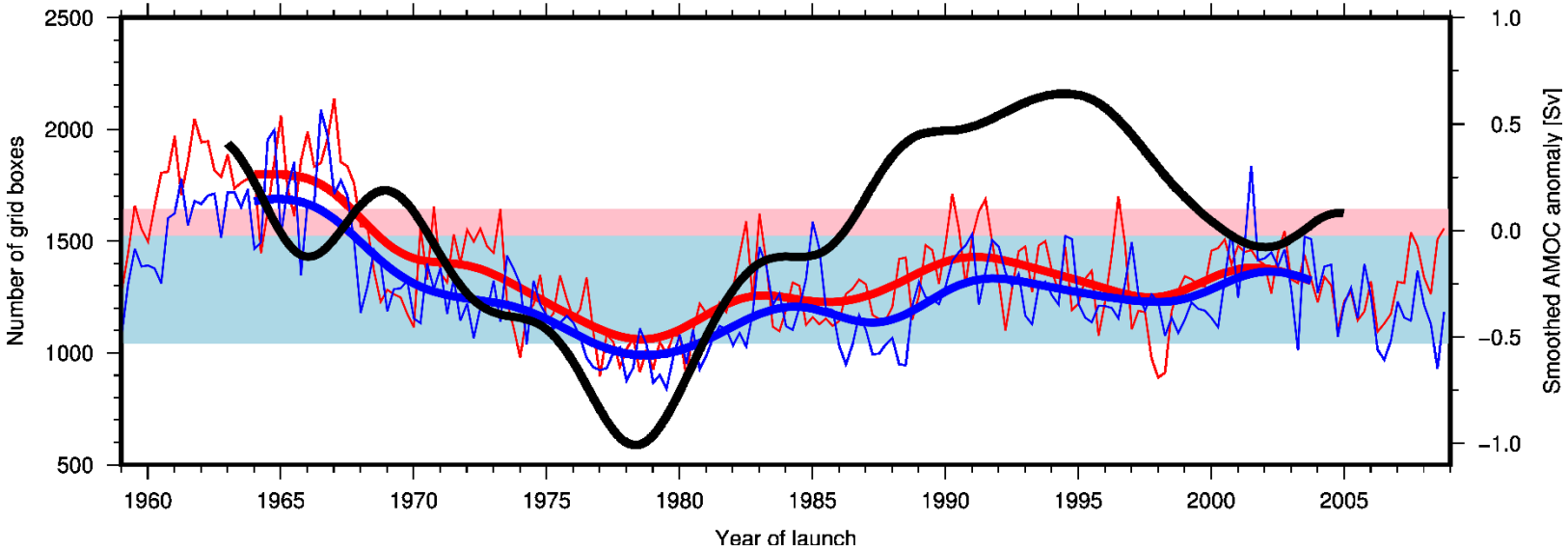




Azores. Passive particles. 1-year tracks. Releases over 50 years.







Remaining ATLAS deliverables including particle tracking modelling:

D1.6 : Biologically realistic Lagrangian connectivity. *Month 32 (December 31 2018)*
Report prepared on the impact of biological parameters on the Lagrangian connectivity of N Atlantic ecosystems.

Task 1.3 Quantify ocean transport pathways and connectivity of water masses at basin and regional management scales (M1-M48): Basin-scale horizontal circulation and vertical mixing of water masses and particle dispersal quantified using the VIKING20 model.

D4.4 : Biological mediation of dispersal in benthos and fish. *Month 36 (April 20 2019)*
Report on how life history traits of selected benthos and fish may mediate dispersal potential and genetic connectivity.

Task 4.2 Predicted and realised dispersal: influence of history and life history traits on connectivity as predicted through VIKING20/regional oceanographic models versus assessed through genomics approach (M6-M36).

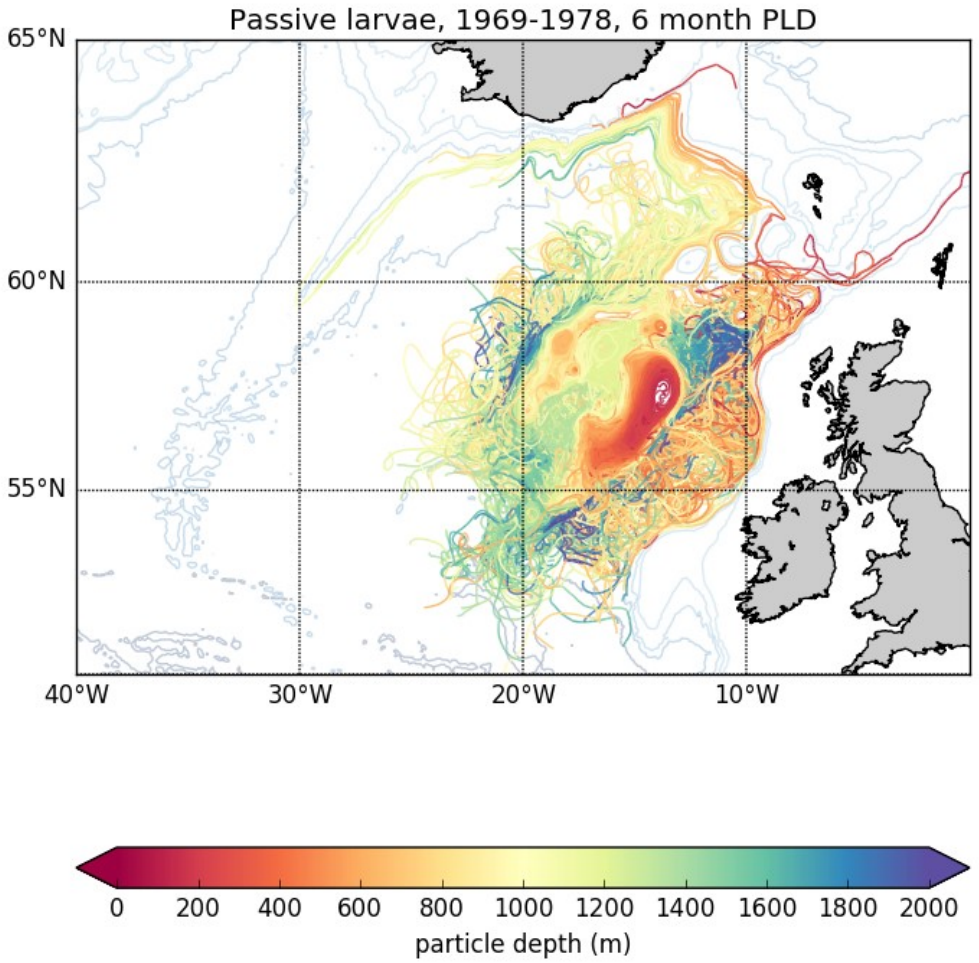
Larval behaviour parameters to be used

Variable	Min	Max	Comments
Age maturity	0 days	10 days	Reach full swim speed
Age competence	4 days	42 days	Begin to head downwards (> age maturity)
Upward speed	0.2 mms^{-1}	1.0 mms^{-1}	
Downward speed	0.2 mms^{-1}	1.0 mms^{-1}	
Target depth	10 m	150 m	

NOTE: Pelagic larval duration (PLD). All runs will be 'long', 6-12 months. Different PLD can be selected by cutting tracks at set age.

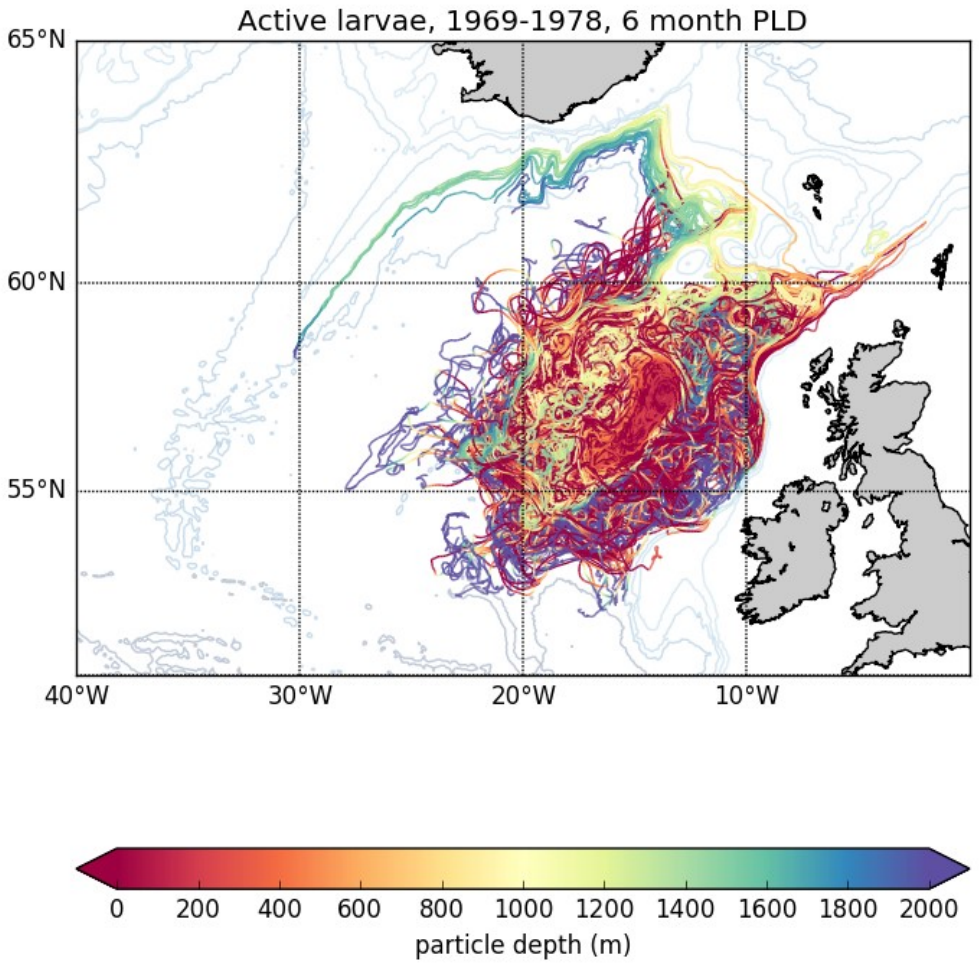
Each variable will be tested individually, giving 2^5 (= 32) runs for 5 variables.

- Passive larvae
- Case Study 3
- Rockall Bank
- 10 years
- PLD 180 days

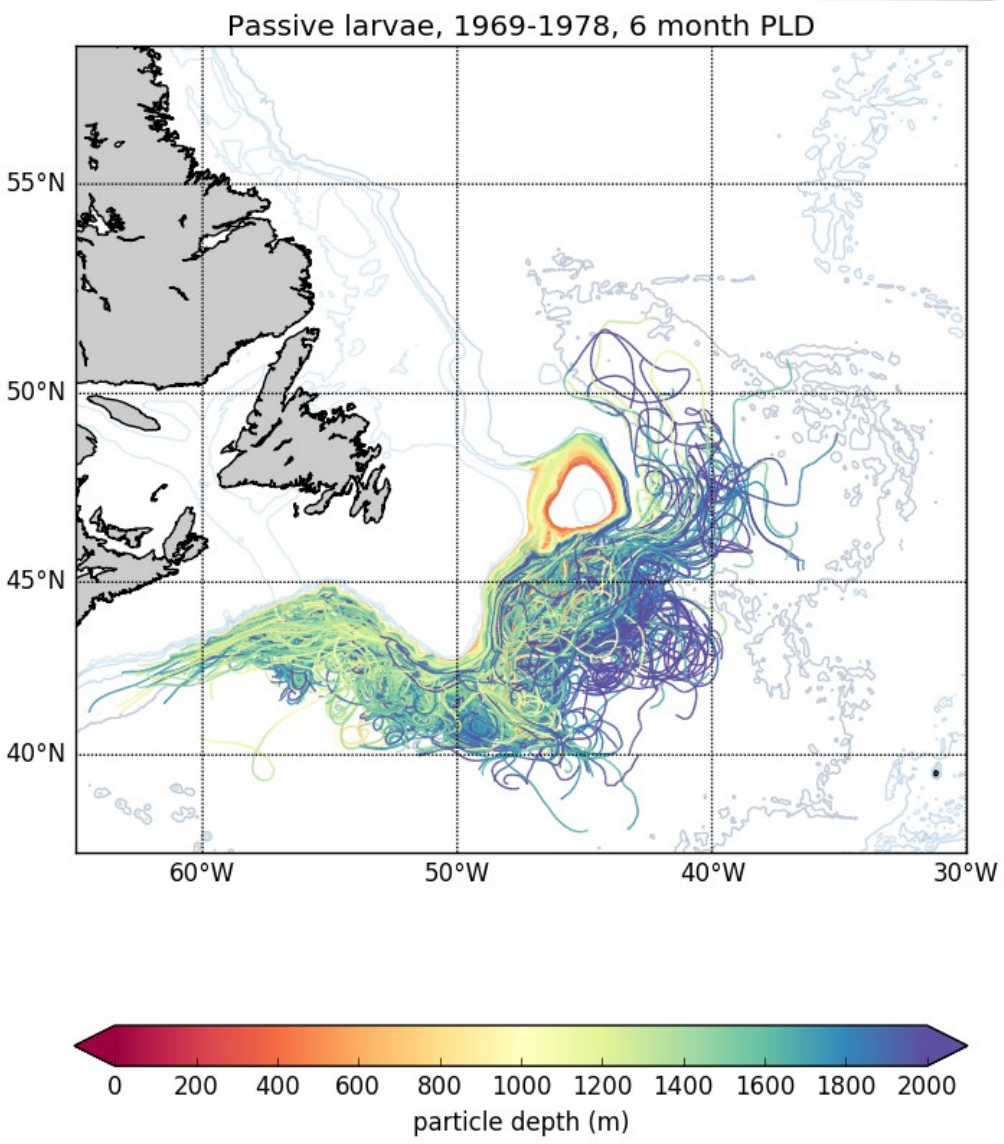


- Active larvae
- Case Study 3
- Rockall Bank
- 10 years
- PLD 180 days

Larvae swim upwards to surface, drift in top 20 m then swim downwards from 42 days old

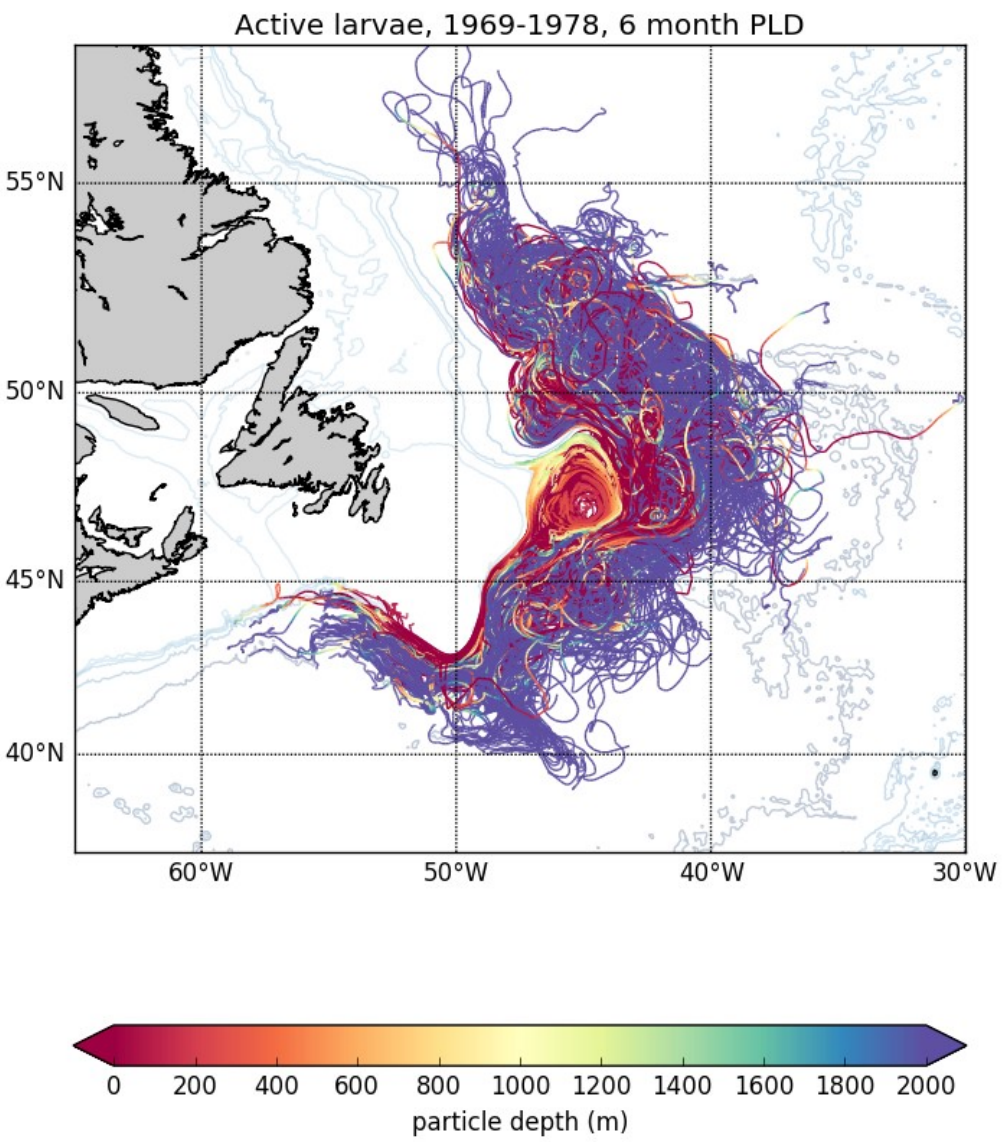


- Passive larvae
- Case Study 1
- Flemish Cap
- 10 years
- PLD 180 days



- Active larvae
- Case Study 11
- Flemish Cap
- 10 years
- PLD 180 days

Larvae swim upwards to surface, drift in top 20 m then swim downwards from 42 days old



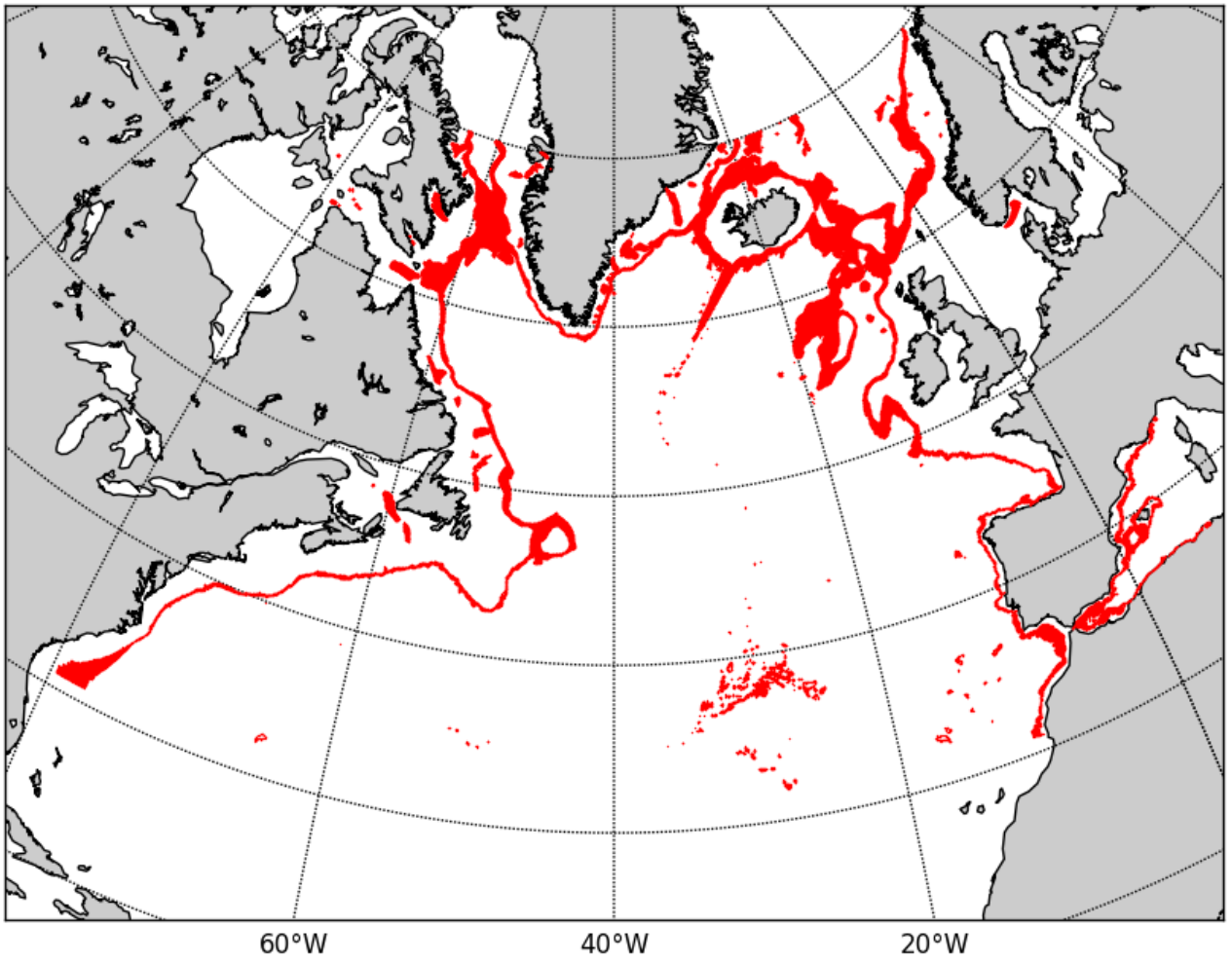
Connectivity

500 – 1200 m

1 year monthly release

1 larvae from each model gridsquare in depth range

1300000 larvae

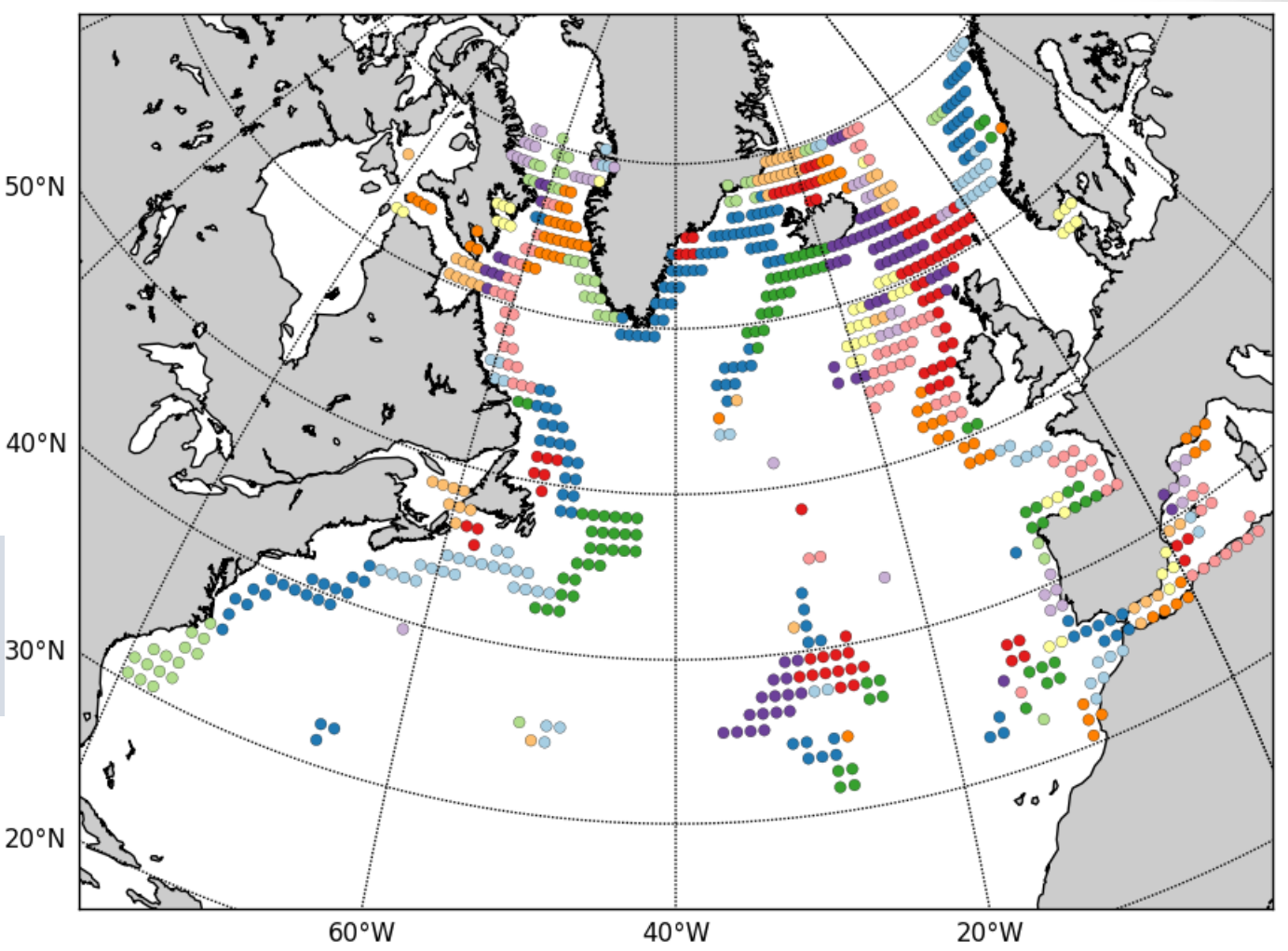


Connected clusters

Passive larvae

10 day PLD

Colour changes where connections are weaker

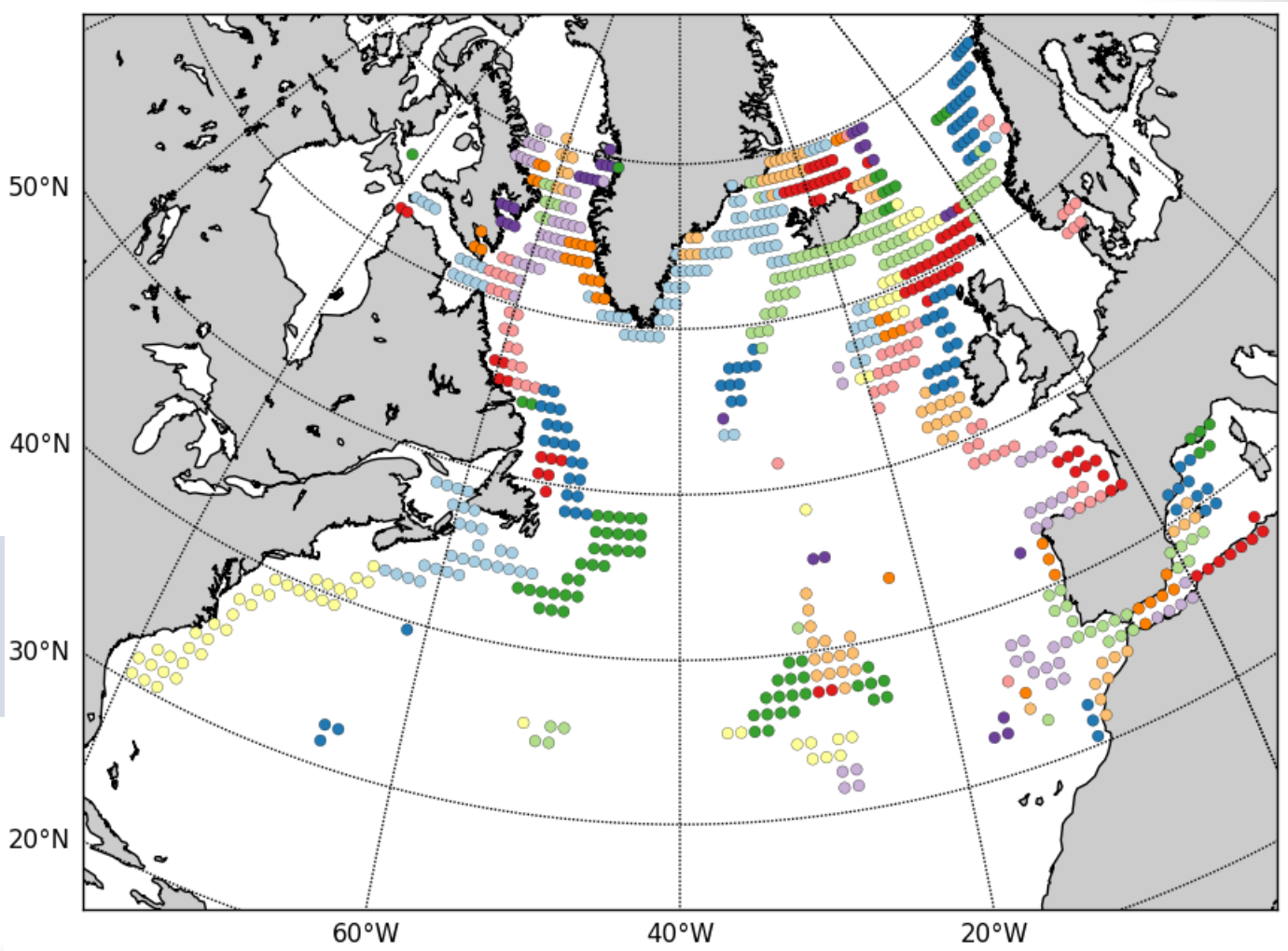


Connected clusters

Passive larvae

20 day PLD

Colour changes where connections are weaker

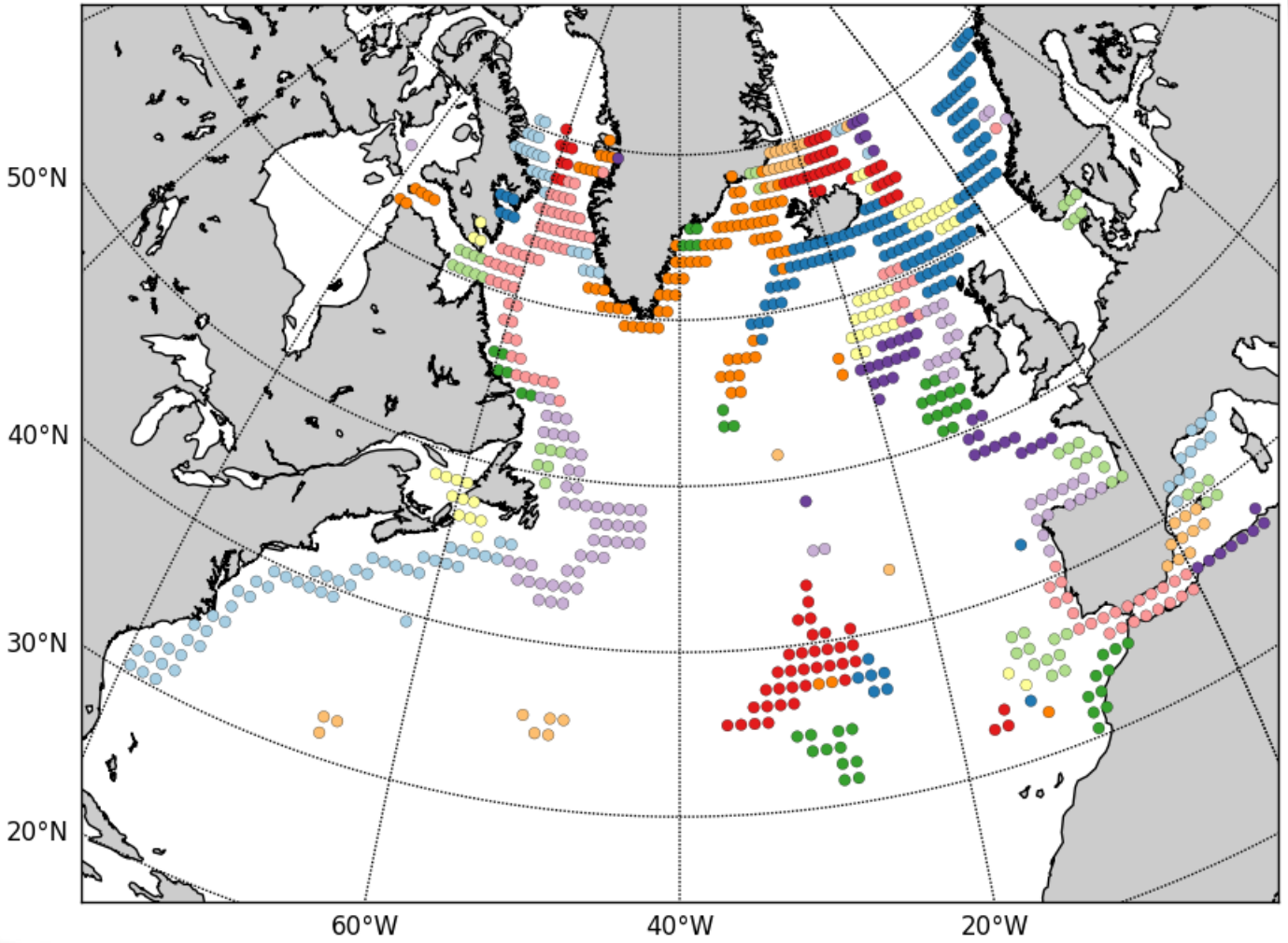


Connected clusters

Passive larvae

40 day PLD

Colour changes where connections are weaker

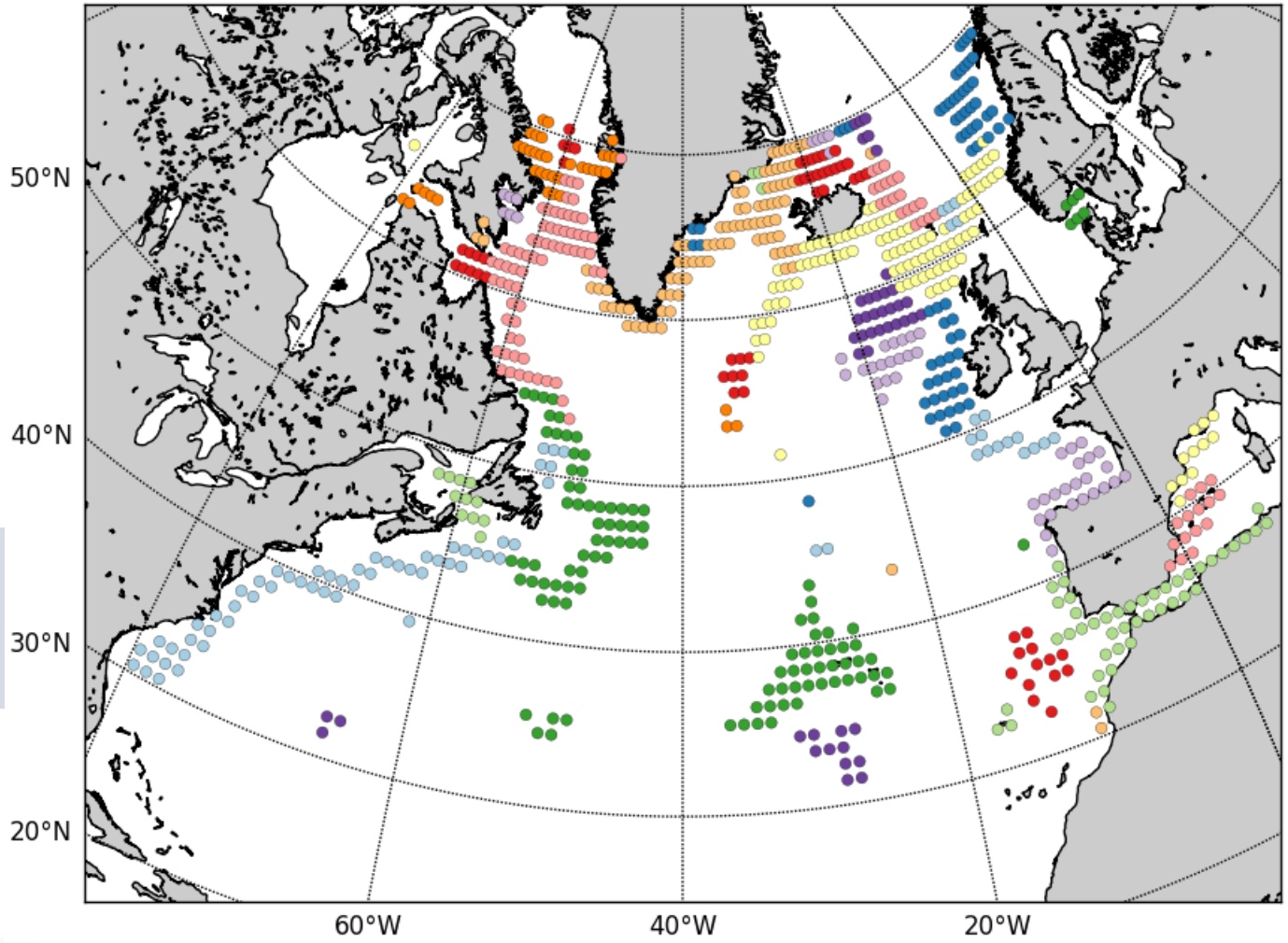


Connected clusters

Passive larvae

80 day PLD

Colour changes where connections are weaker

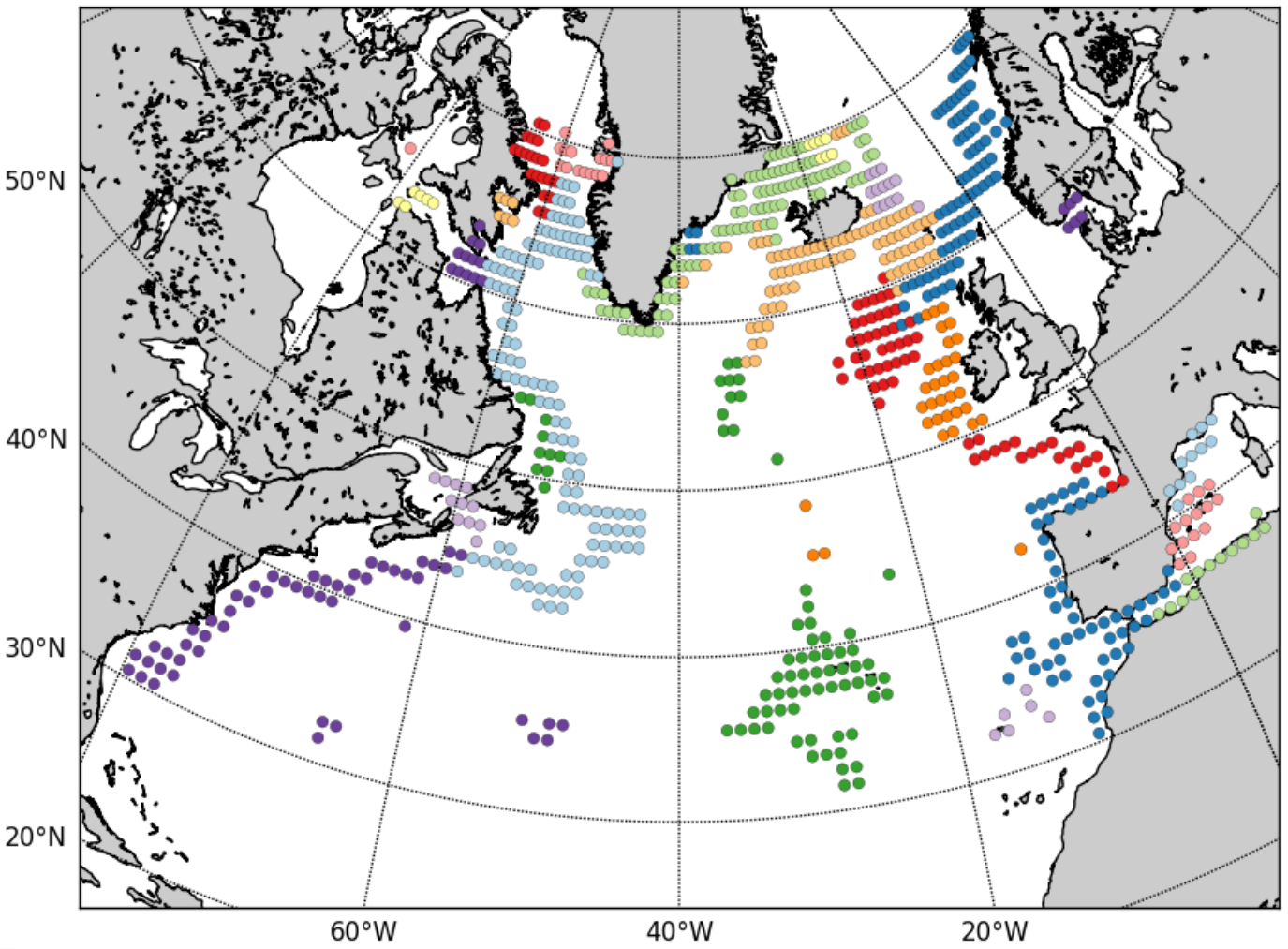


Connected clusters

Passive larvae

180 day PLD

Colour changes where connections are weaker



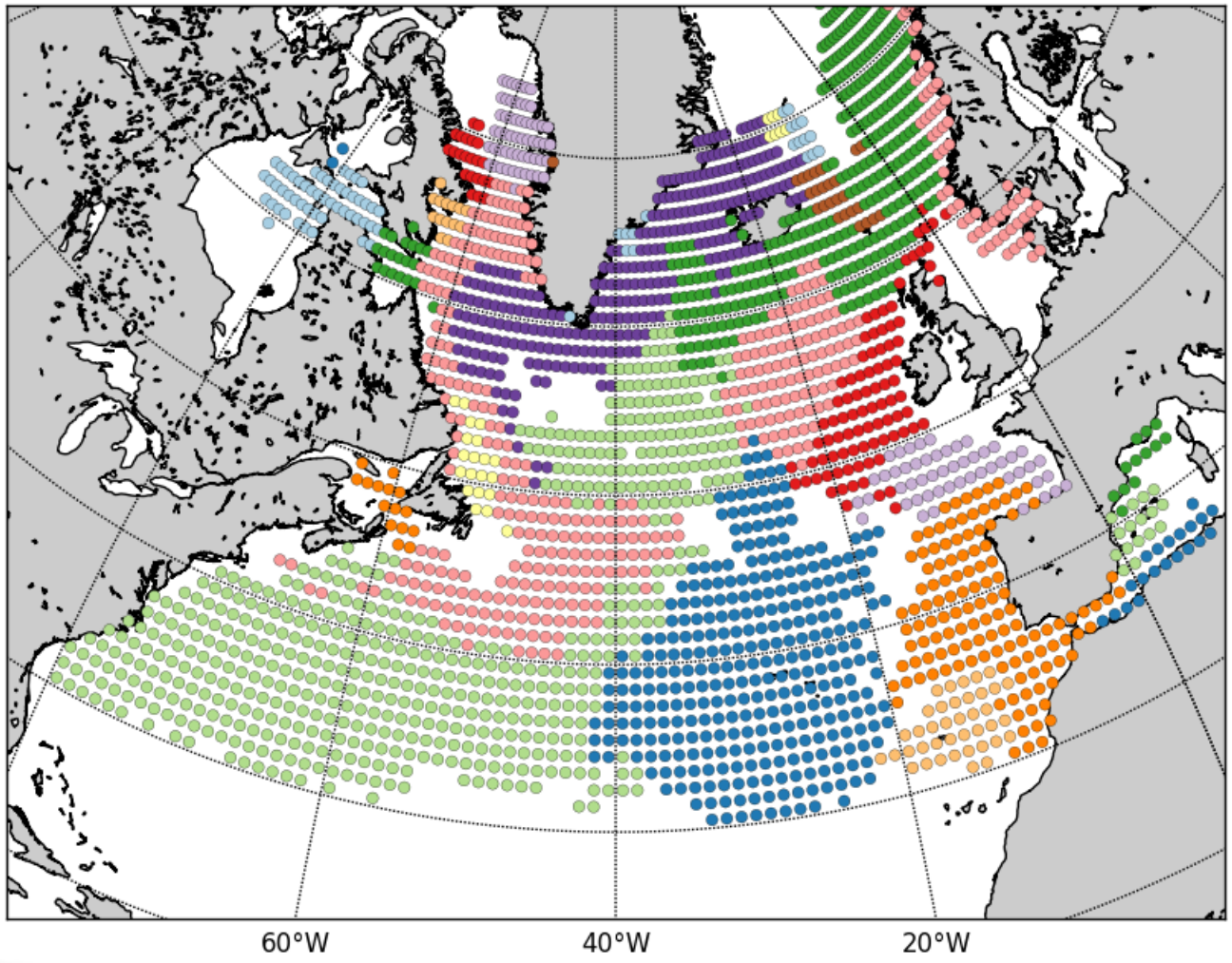
Connected clusters

Passive larvae

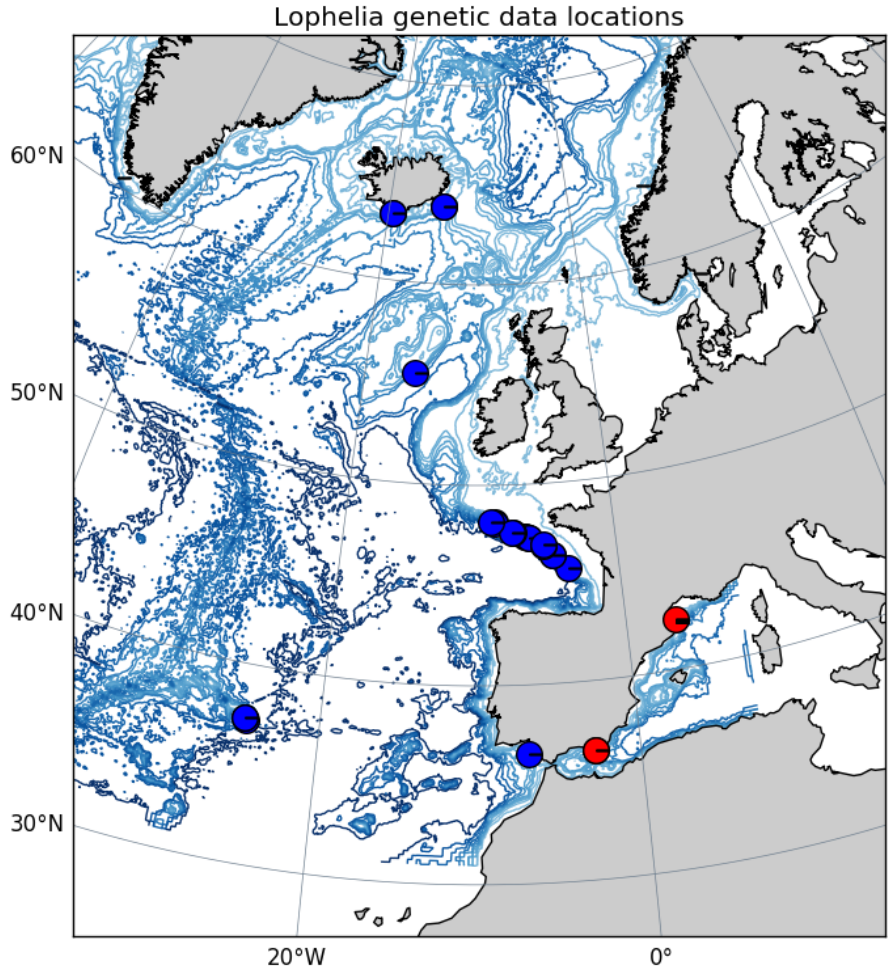
180 day PLD

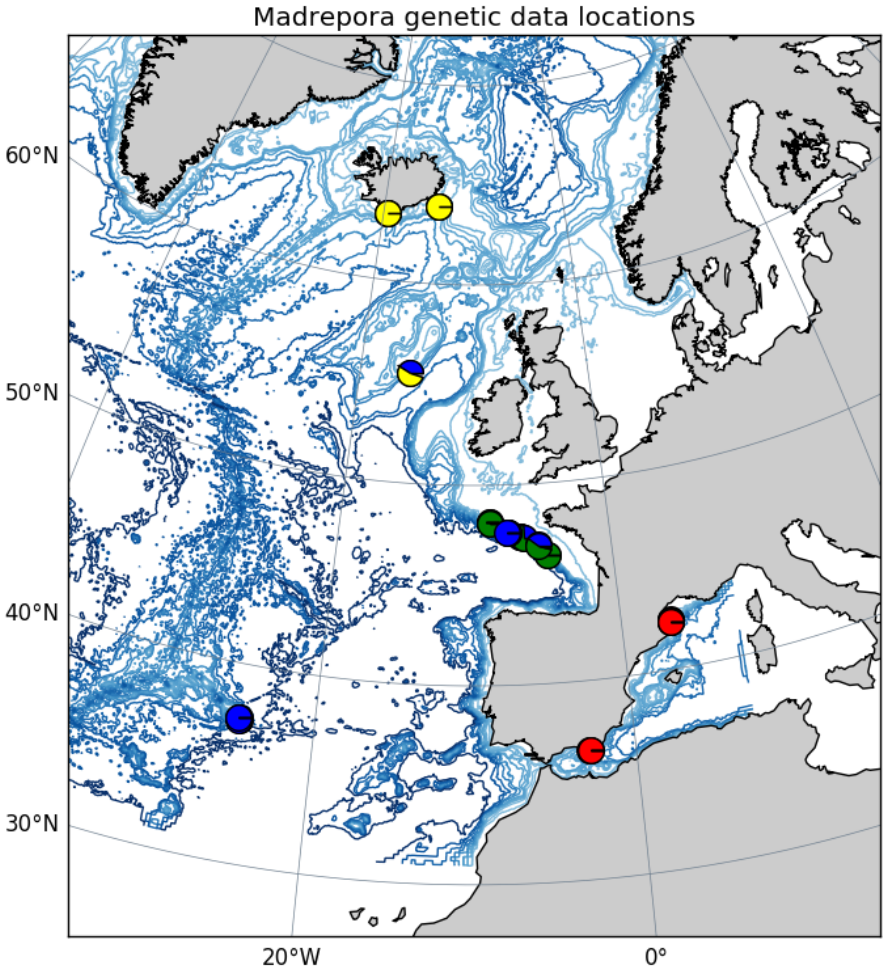
All larvae

Colour changes where connections are weaker



Bay of Biscay – modelled and genetic connectivity





Bay of Biscay – modelled and genetic connectivity