



# Changes in Arctic Halocline Waters along the East Siberian Slope and in the Makarov Basin from 2007 to 2020

Cécilia Bertosio<sup>1</sup>★, Christine Provost<sup>1</sup>, **Marylou Athanase**<sup>2\*</sup>, Nathalie Sennéchael<sup>1</sup>, Gilles Garric<sup>3</sup>, Jean-Michel Lellouche<sup>3</sup>,  
Joo-Hong Kim<sup>4</sup>, Kyoung-Ho Cho<sup>4</sup>, and Taewook Park<sup>4</sup>

<sup>1</sup>LOCEAN-IPSL, Sorbonne Université, Paris, France

<sup>2</sup>Alfred-Wegener-Institut, Bremerhaven, Germany

<sup>3</sup>MERCATOR-OCEAN, Toulouse, France

<sup>4</sup>Division of Polar Ocean Sciences, Korea Polar Research Institute, Republic of Korea

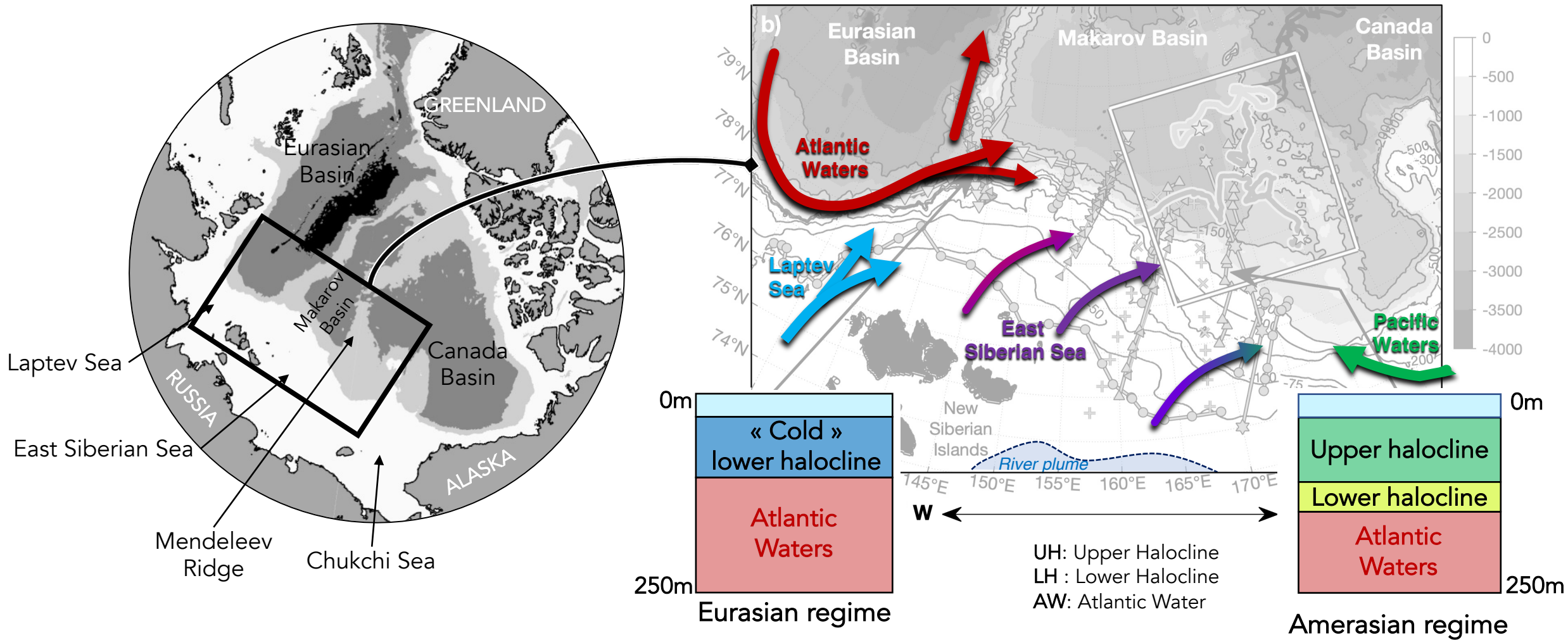
*Under review in JGR: Oceans*

★: [cecilia.bertosio.espci@gmail.com](mailto:cecilia.bertosio.espci@gmail.com)

\*: [marylou.athanase@awi.de](mailto:marylou.athanase@awi.de)



- ❑ Where is located the front between an « Eurasian » halocline regime and an « Amerasian » halocline regime?
- ❑ What is the interannual evolution of the front between the two halocline regimes ?



# Data along the ESS and in the MB

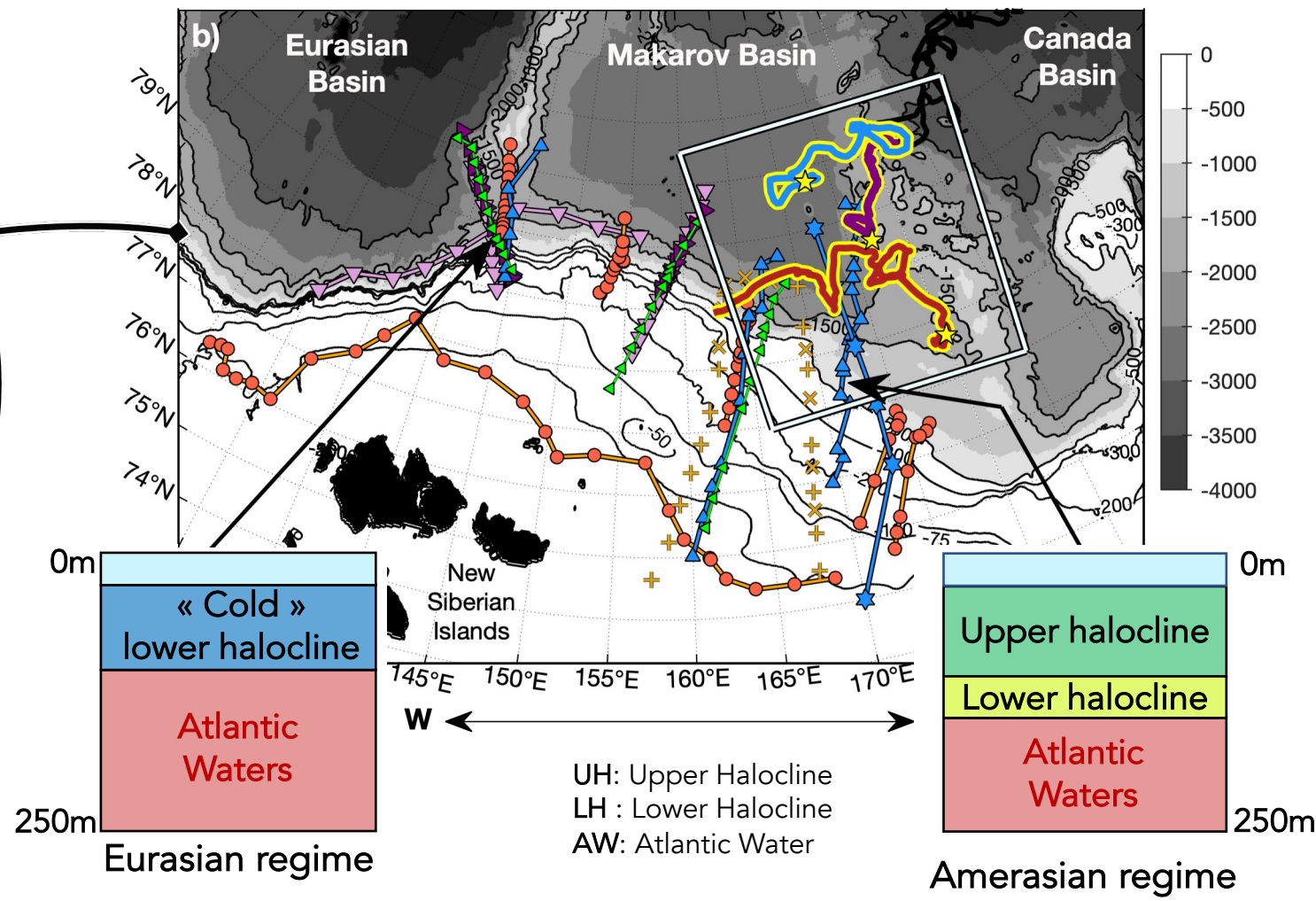
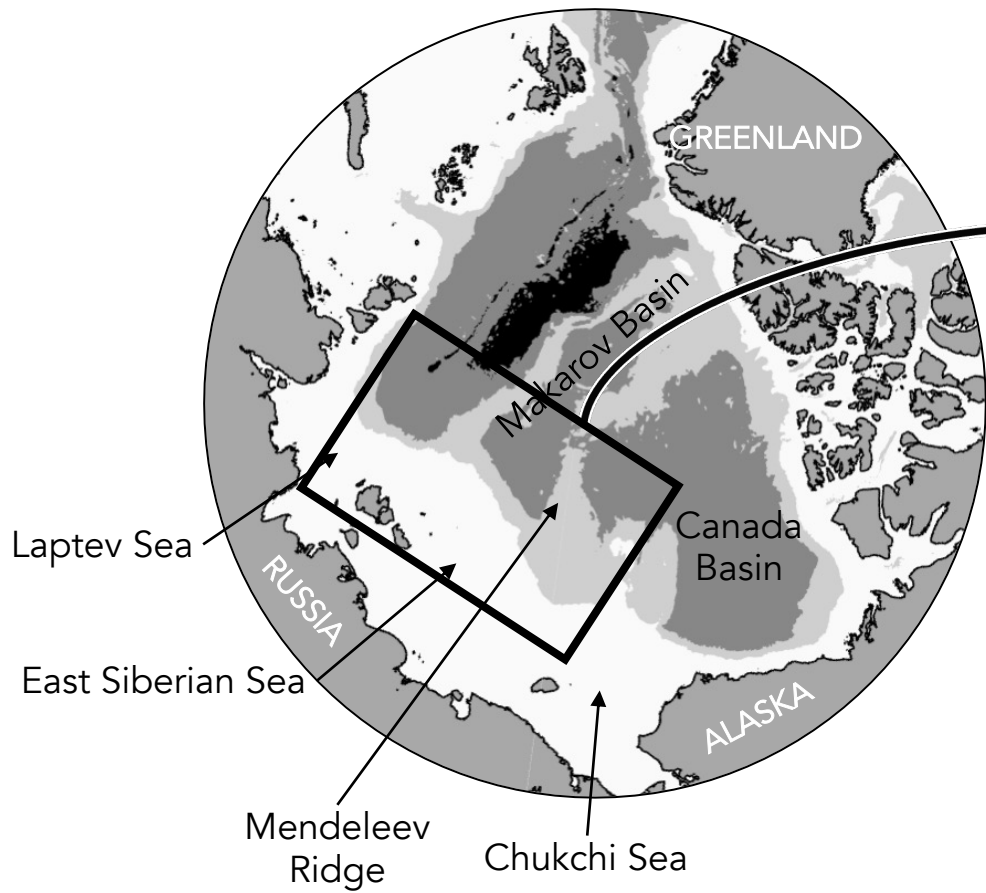
- |                 |                     |
|-----------------|---------------------|
| ▽ NABOS (2007)  | ★ ARAON (2015)      |
| ▼ NABOS (2008)  | × La-77 XCTD (2016) |
| ▬ ITP29 (2008)  | + La-77 CTD (2016)  |
| ● SWERUS (2014) | ▬ IAOS25 (2017)     |
| ▲ NABOS (2015)  | ◀ NABOS (2018)      |
| ▬ IAOS15 (2015) |                     |

+

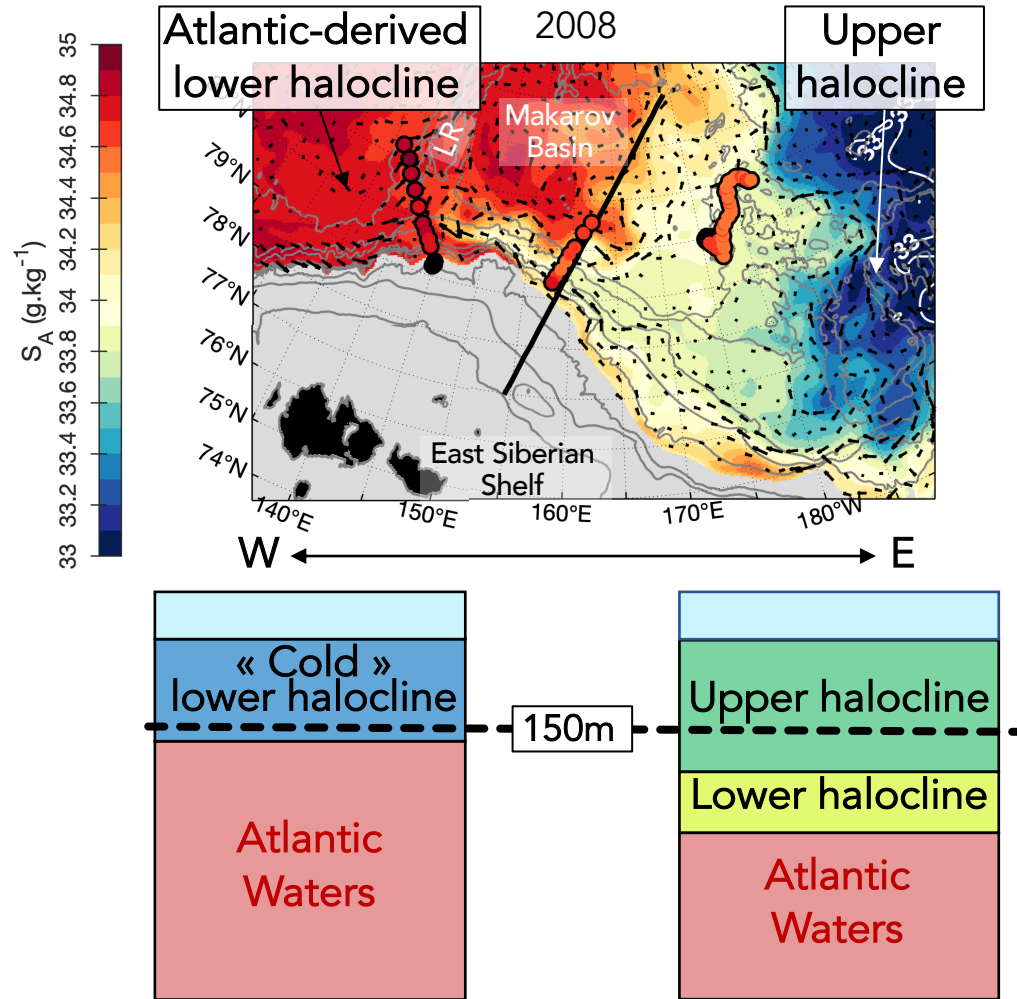


**MERCATOR OCEAN**  
INTERNATIONAL

1/12° operational model

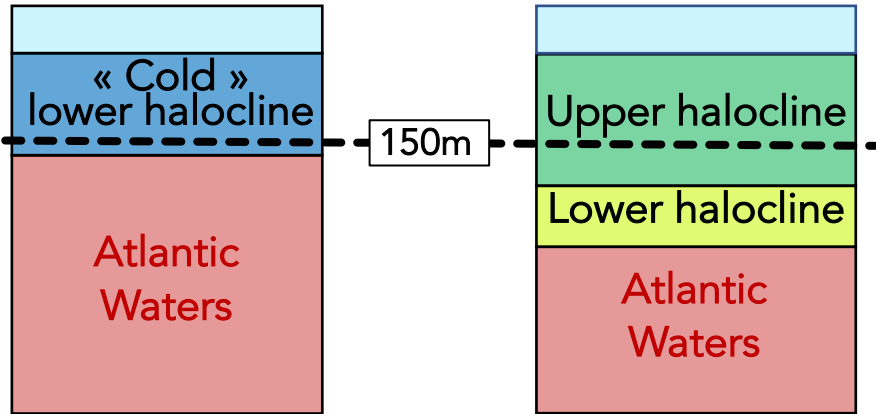
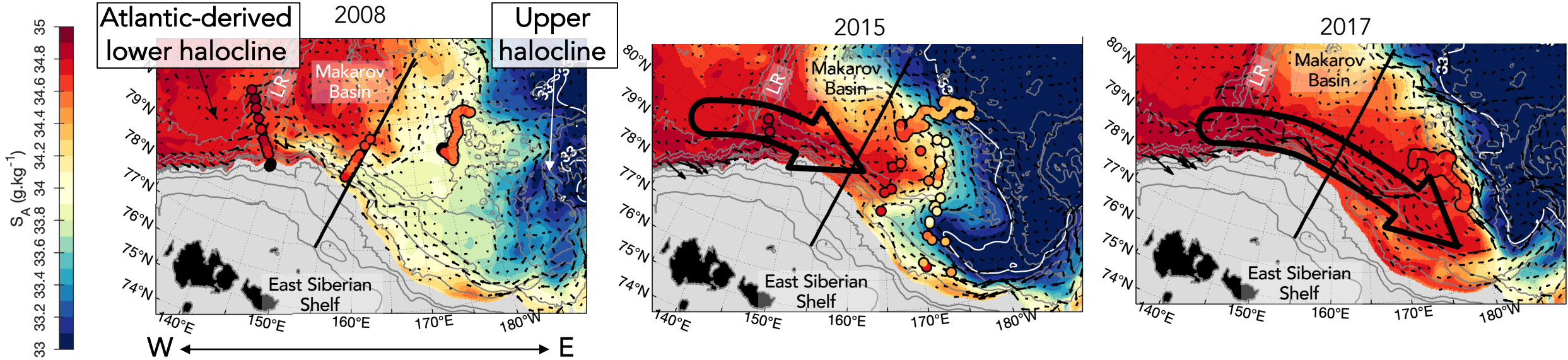


## Salinity at 150m





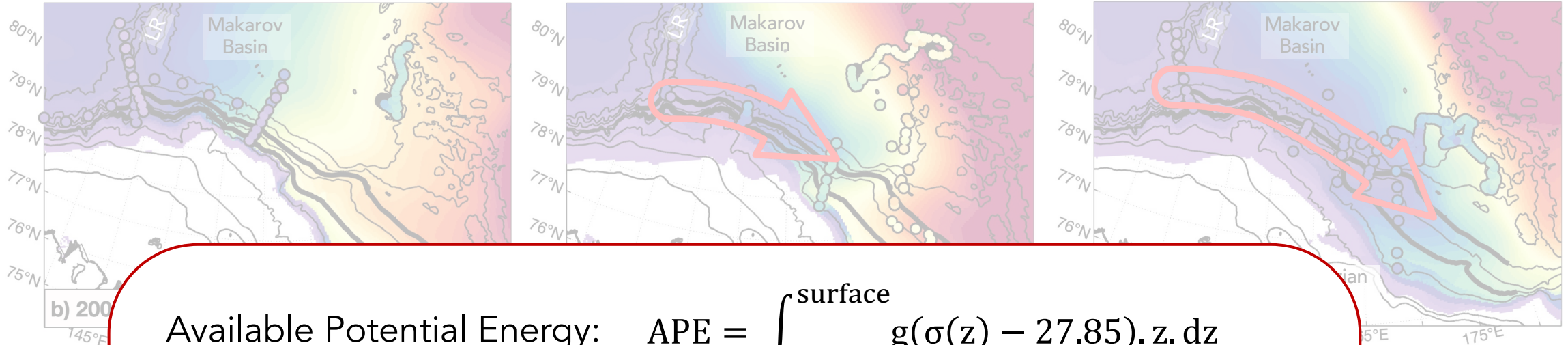
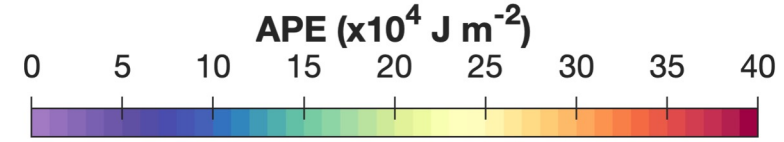
## Salinity at 150m



Progression of salty Atlantic derived lower halocline

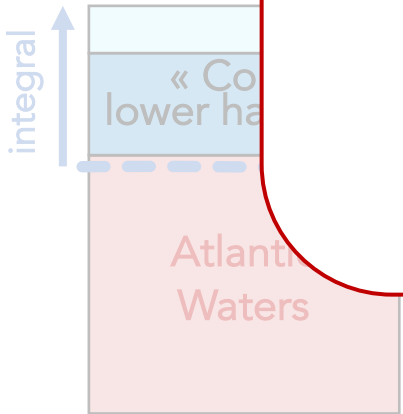


integral indicator of  
**Available Potential Energy (APE) = halocline strength**



Available Potential Energy: 
$$APE = \int_{27.85}^{\text{surface}} g(\sigma(z) - 27.85) \cdot z \cdot dz$$

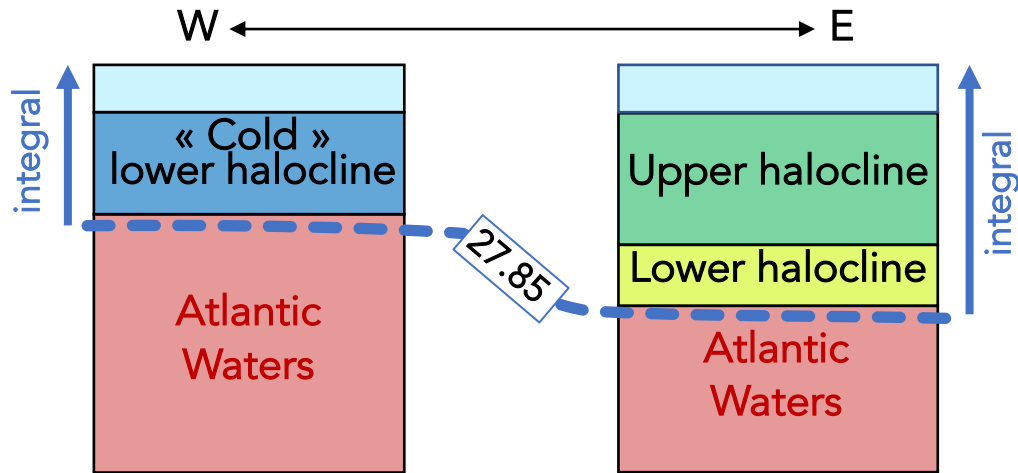
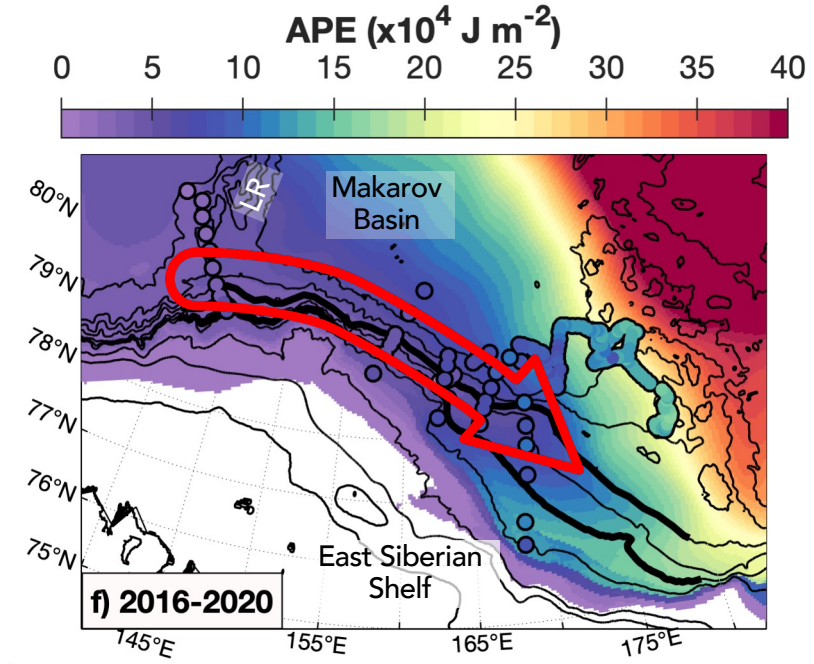
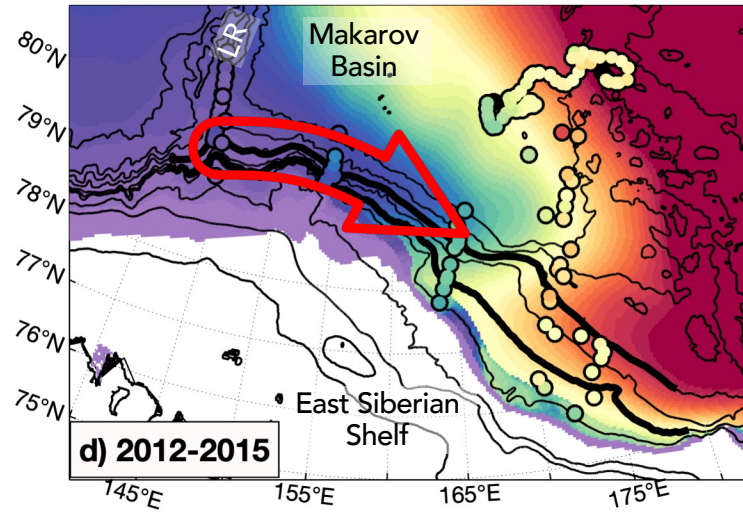
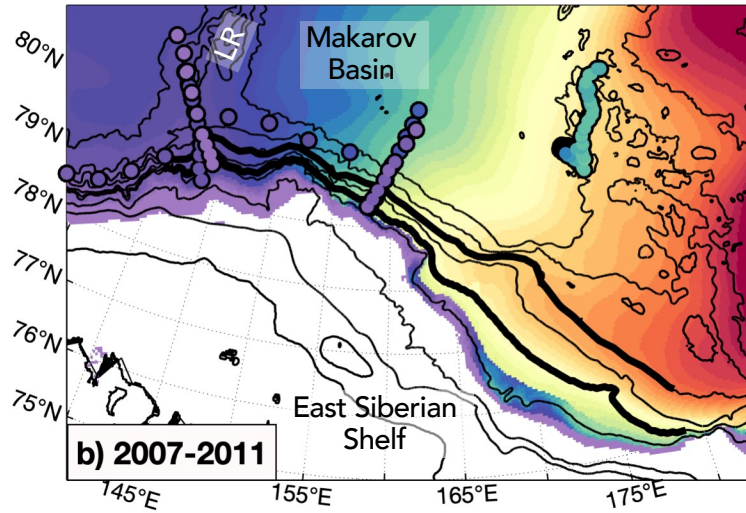
Large APE ↔ strong halocline  
 Low APE ↔ weaker halocline



strong halocline  
 (stratified)



Available Potential Energy (APE) = halocline strength  
 integral indicator of

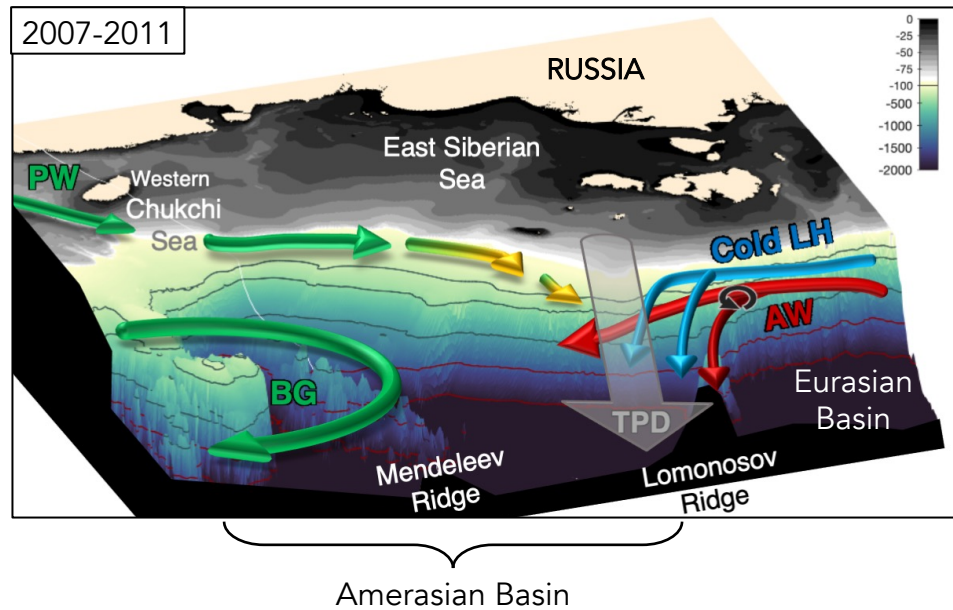


Progression of salty **Atlantic derived lower halocline**

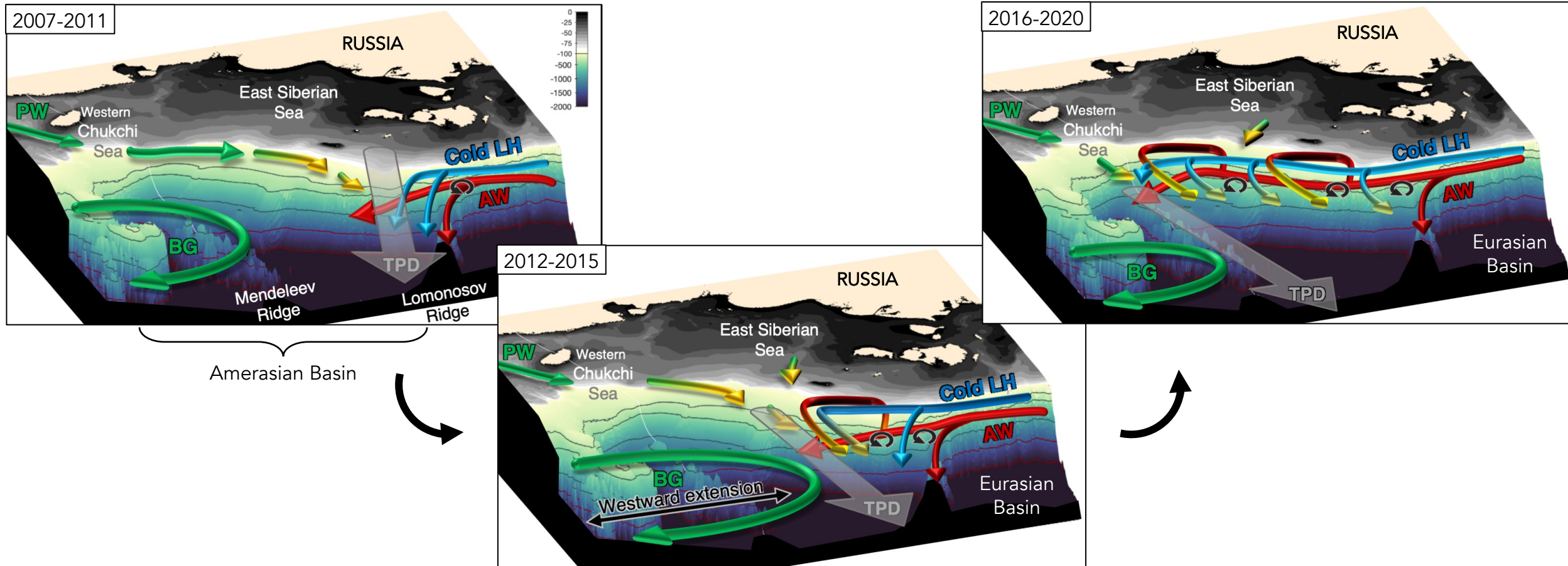
Atlantic derived → weaker (less strongly stratified)



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➔ Progression of Atlantic-derived lower halocline towards Amerasian Basin

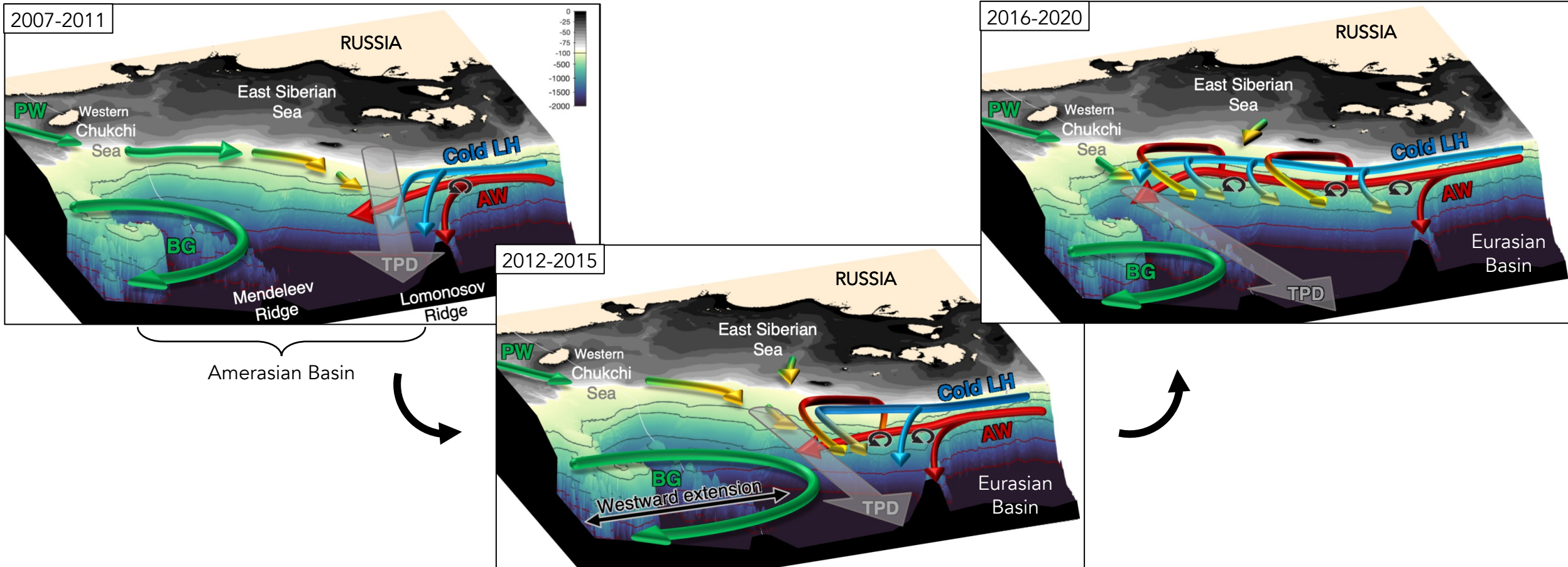


# Summary

➔ Read more:

Changes in Arctic freshwater distribution  
 Bertosio et al. (2022a)  
 accepted in JGR: Oceans

Changes in Arctic Halocline Waters  
 Bertosio et al. (2022b)  
 Under review in JGR: Oceans



➔ Progression of Atlantic-derived lower halocline towards Amerasian Basin