The Link Between Cetacean Abundance and Environmental Feature

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Could be environmental feature used to looking for areas of high cetacean abundance?

- **Environmental tolerance**

  It is range of environmental condition, which marine creature can live

- **Environmental favorite**

  Which is the best environment condition for marine creature to live

Could be environmental feature used to looking for areas of cetacean distribution?

Tolerance

	Fish & others	Cetacean
Temperature	Narrow	Wide
Oxygen	Narrow	Wide
Salinity	N.A.	N.A.

Temperature tolerance

- War blood
- Body temperature constant
- Blubber

Could be environmental variable used to looking for areas of cetacean distribution?

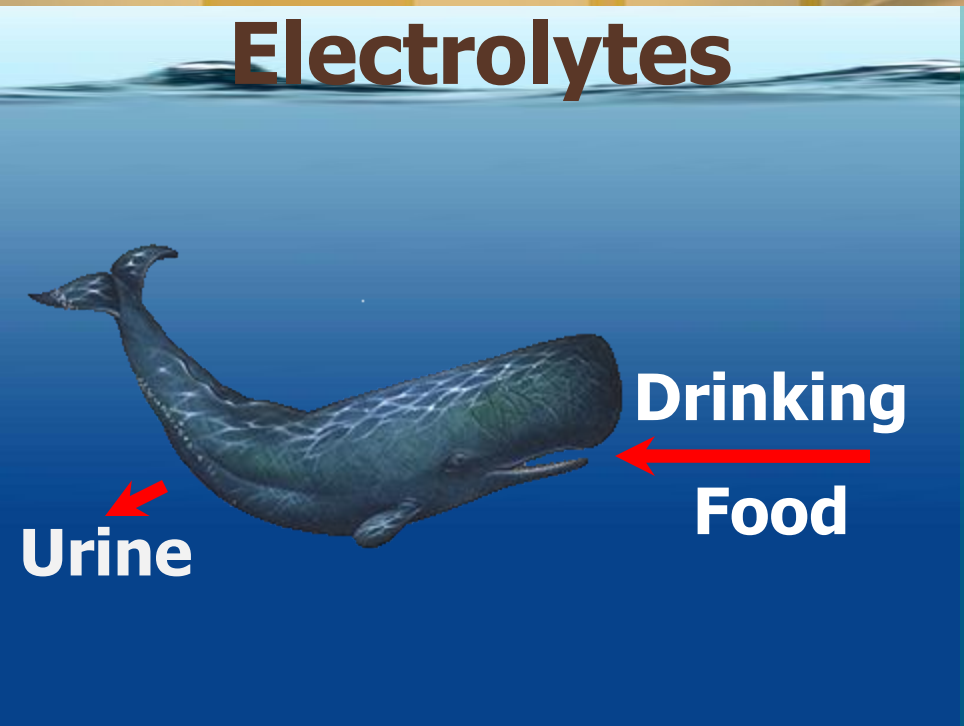
Oxygen tolerance

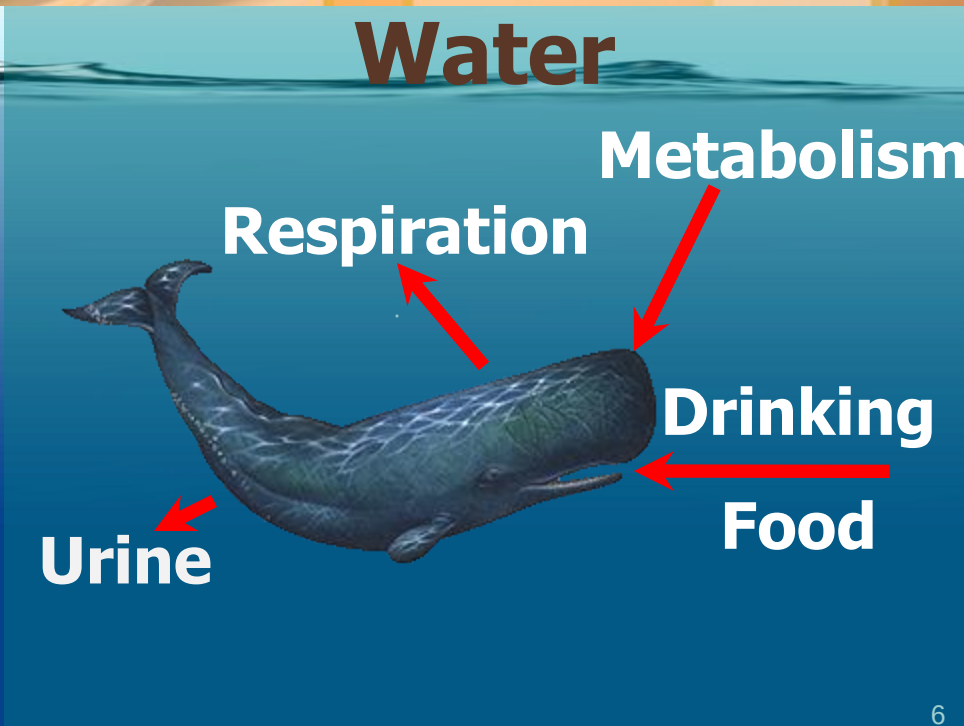
Final electron receptor

Could be environmental variable used to looking for areas of cetacean distribution?

Salinity tolerance

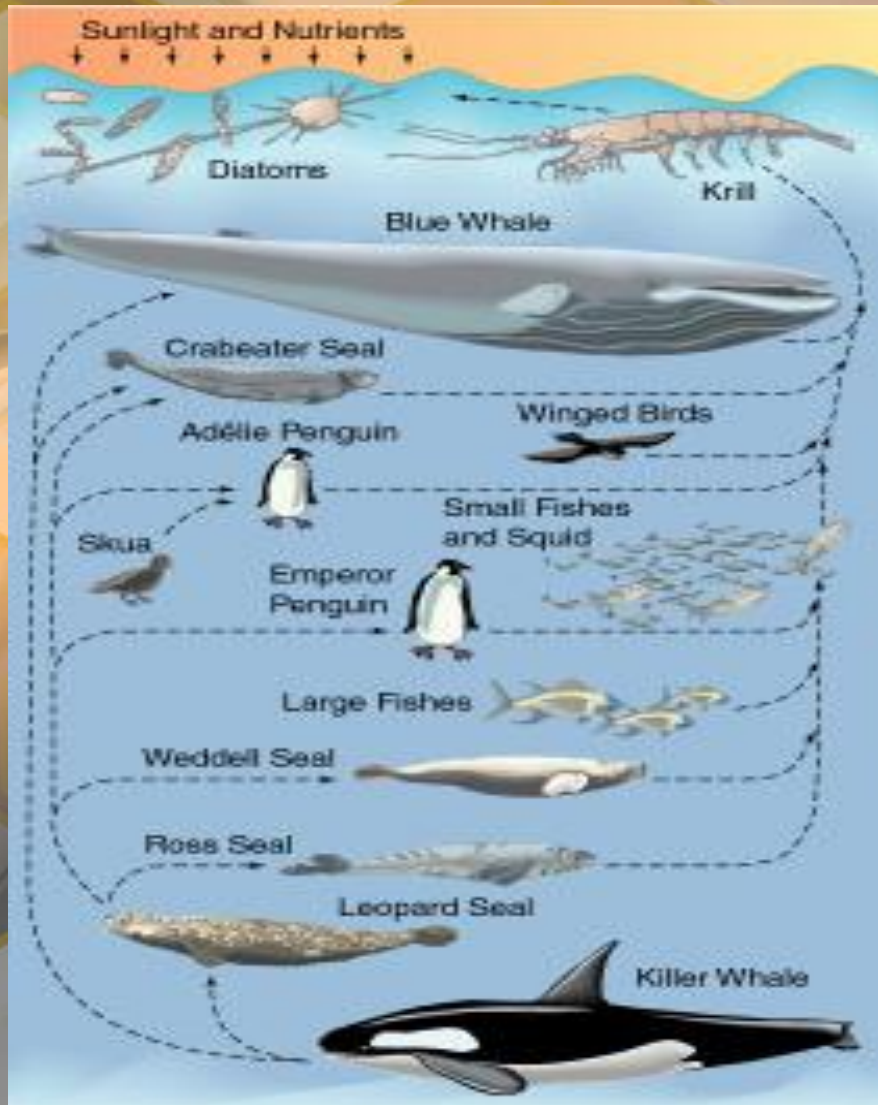
- Develop a specialized kidney





Could be environmental variable used to looking for areas of cetacean distribution?

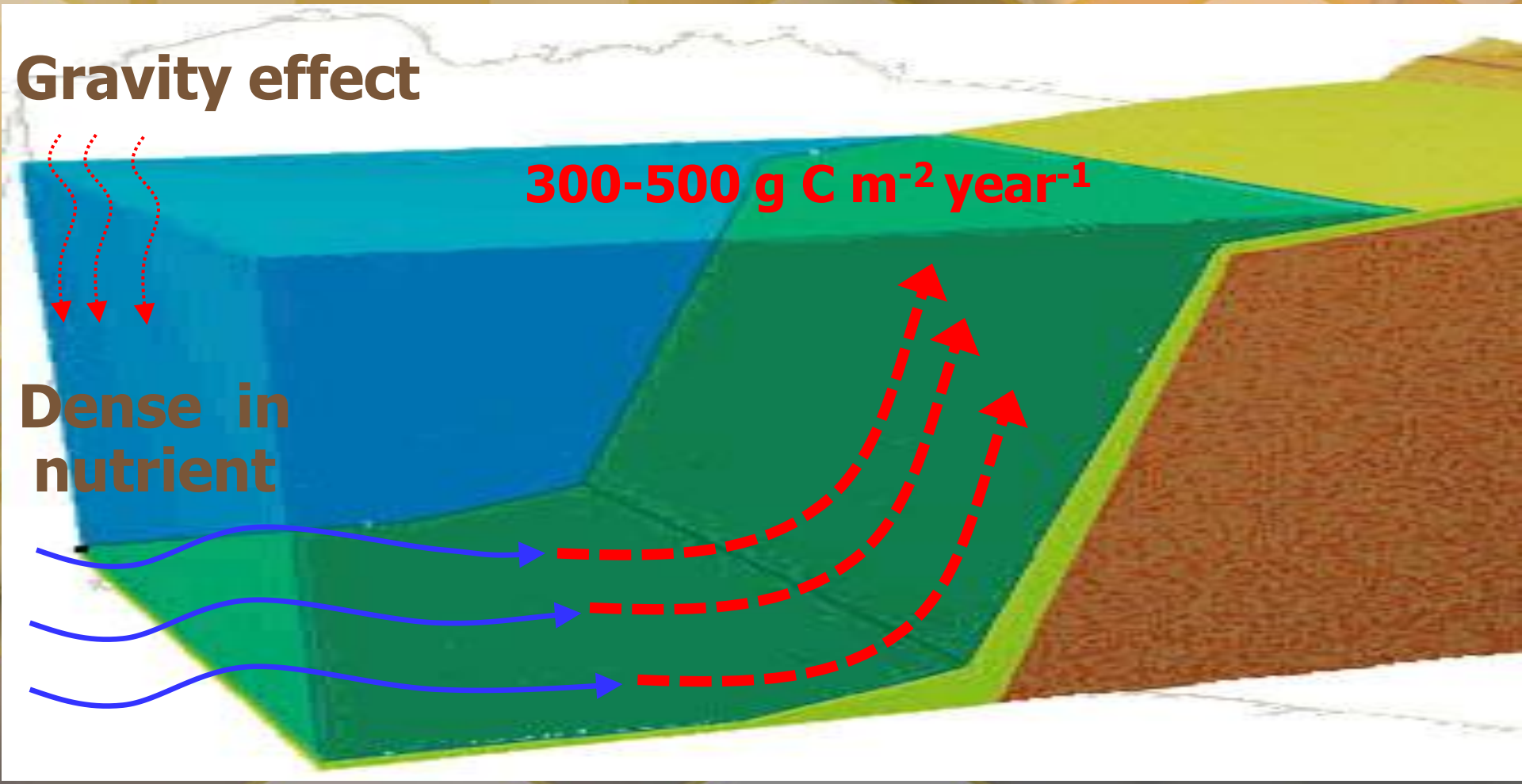
Favorite condition Prey



The link Between cetacean abundabce and environmental feature

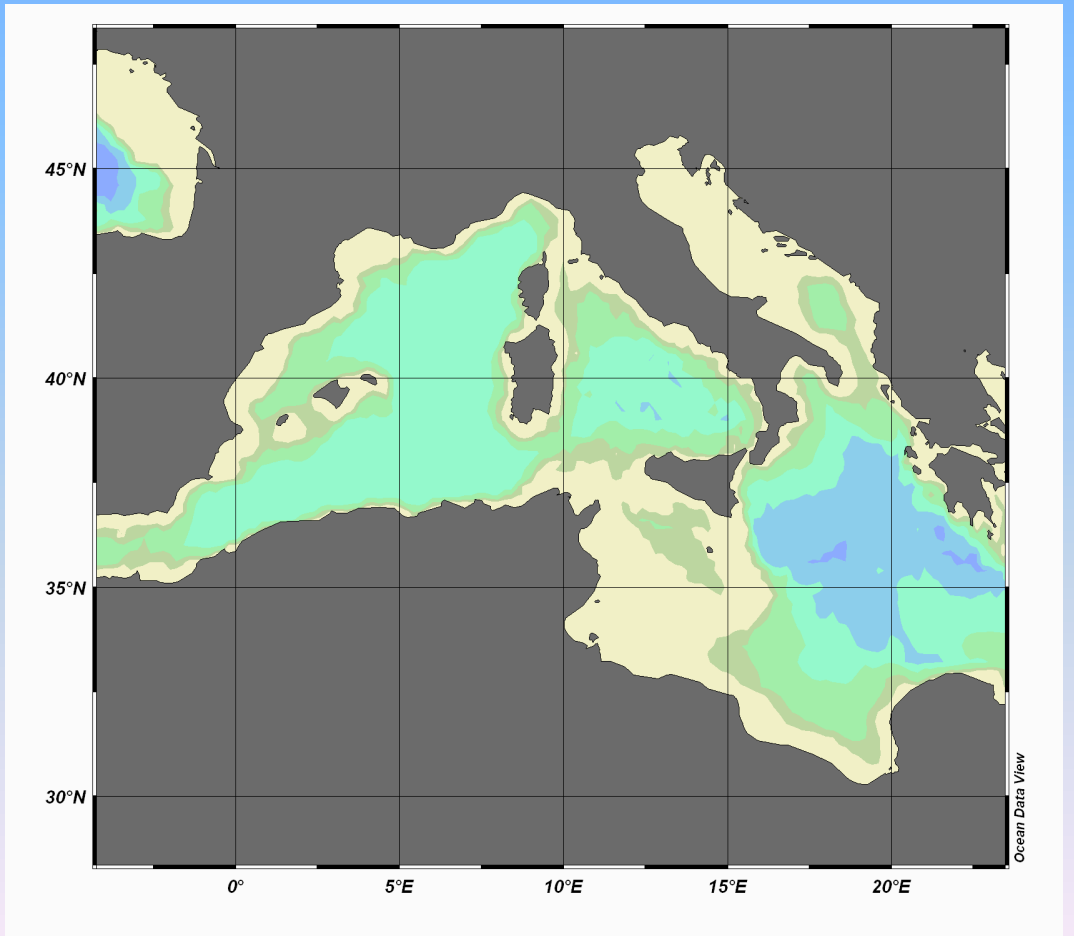
- Slope
- Thermal front
- Chlorophyll-a concentration
- Depth
- River runoff

Slope



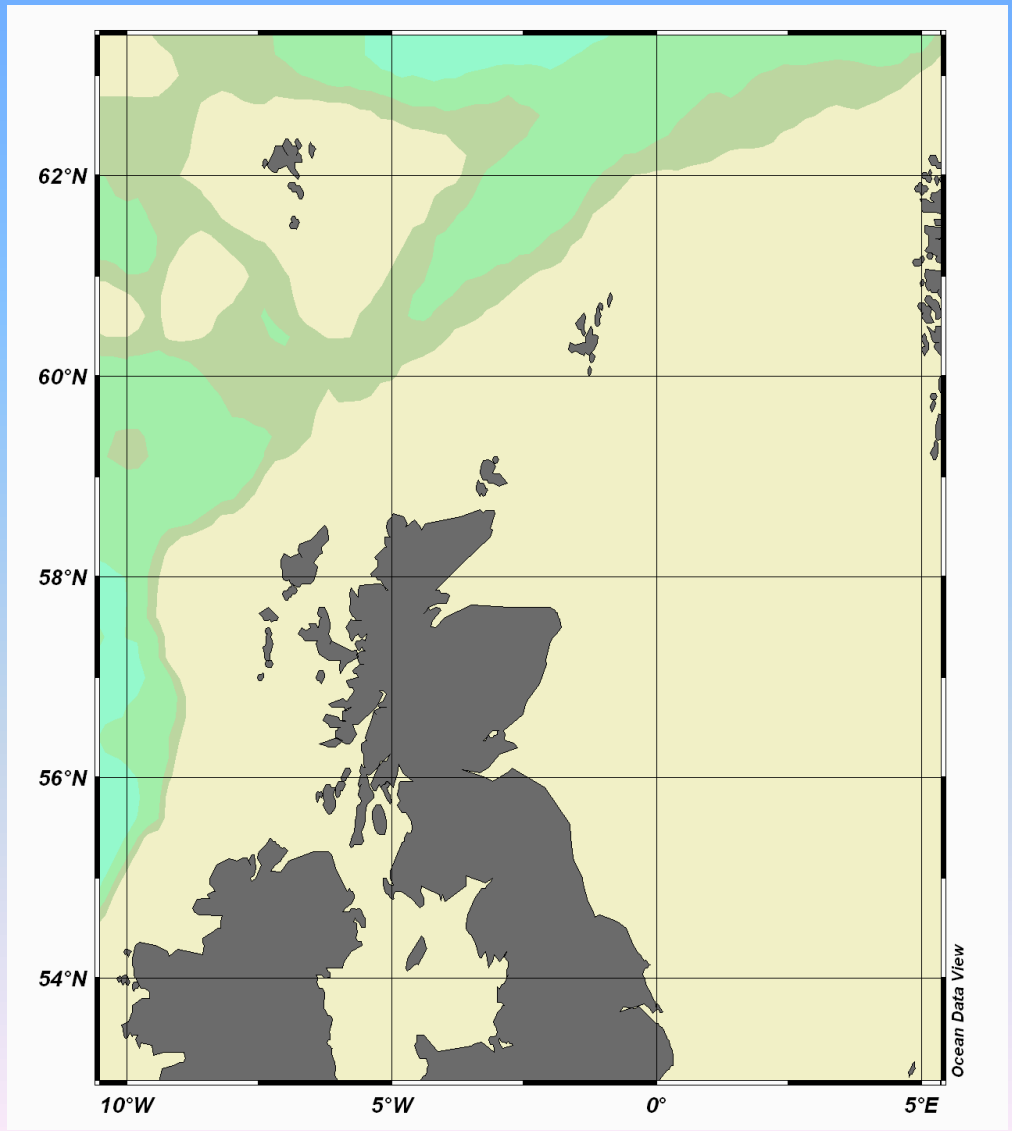
Slope

Risso's dolphin in the Mediterranean Sea (Bonaccorsi and Sacchi, 1999)



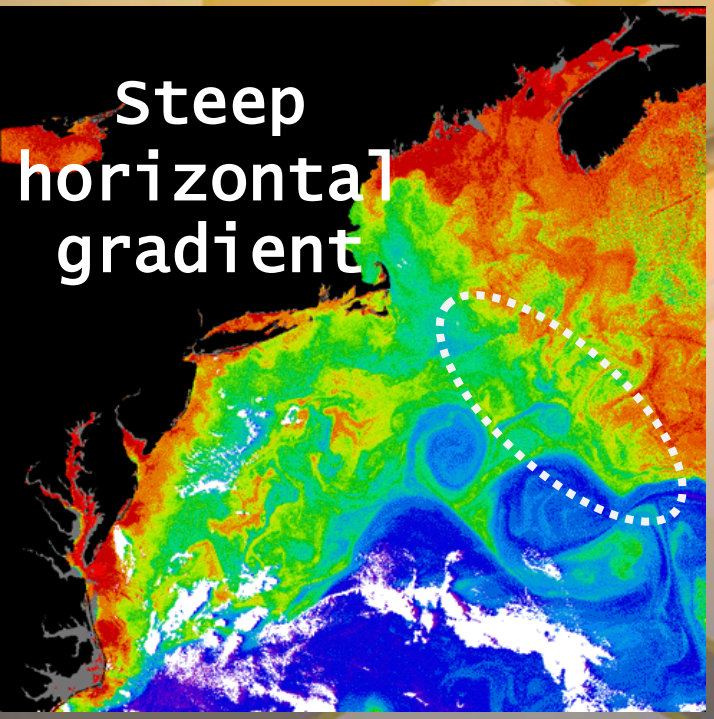
Slope

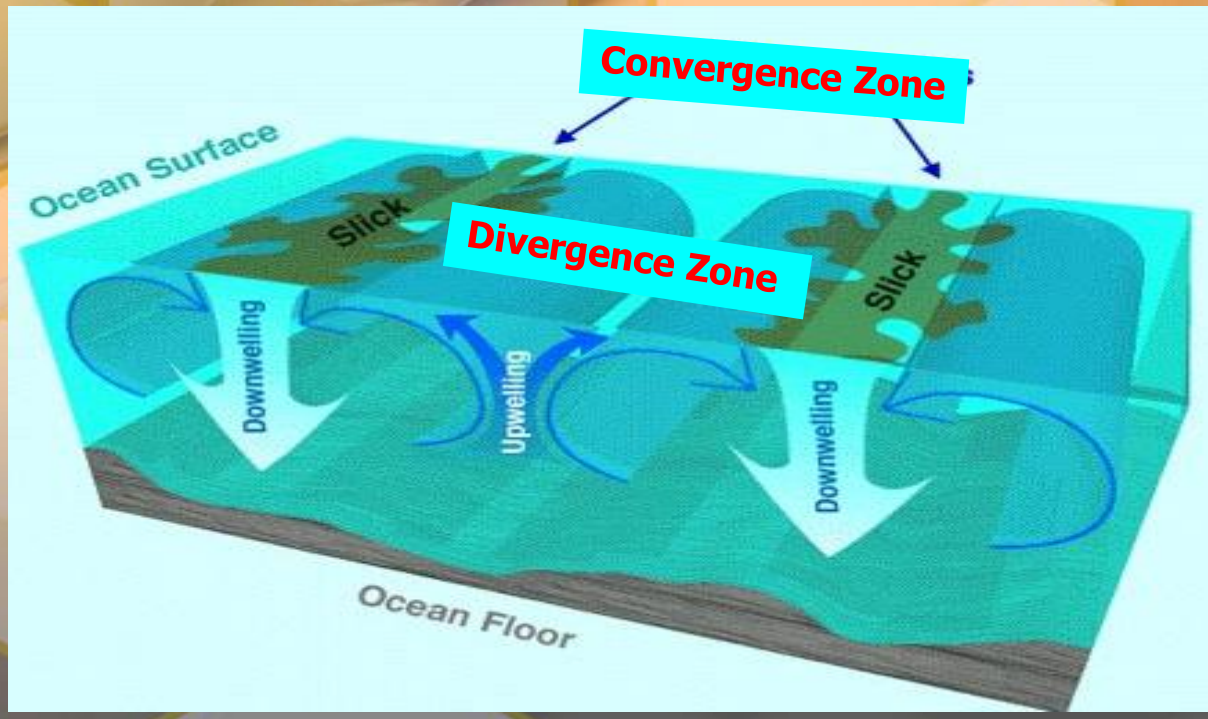
Minke whale in the Outer Moray Firth, Scotland (Tetley, 2004)



Thermal front

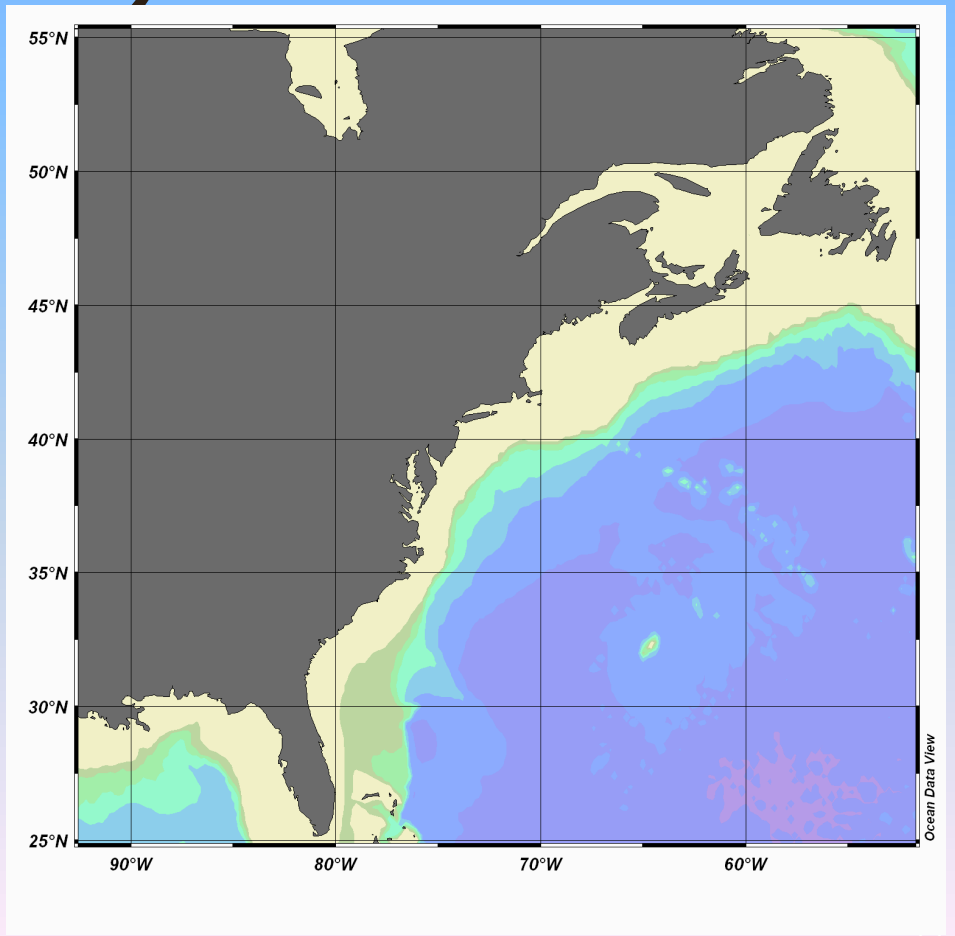
Fronts are the area of farcing between two water mass that have contrasting properties, particularly temperature or salinity





Thermal front

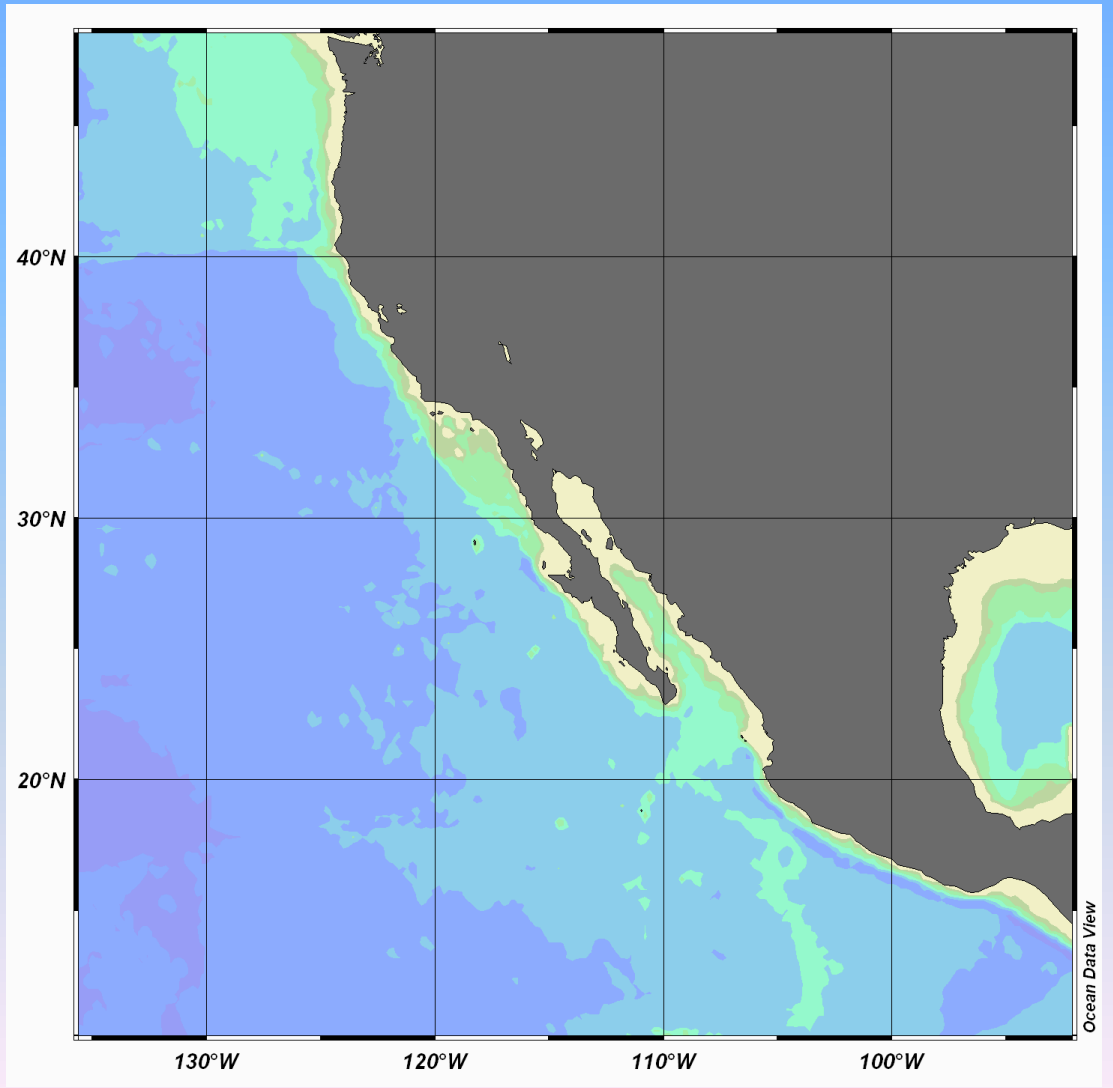
Northern right whale in the Great South Channel, Canada (Brown&Winn, 1989)



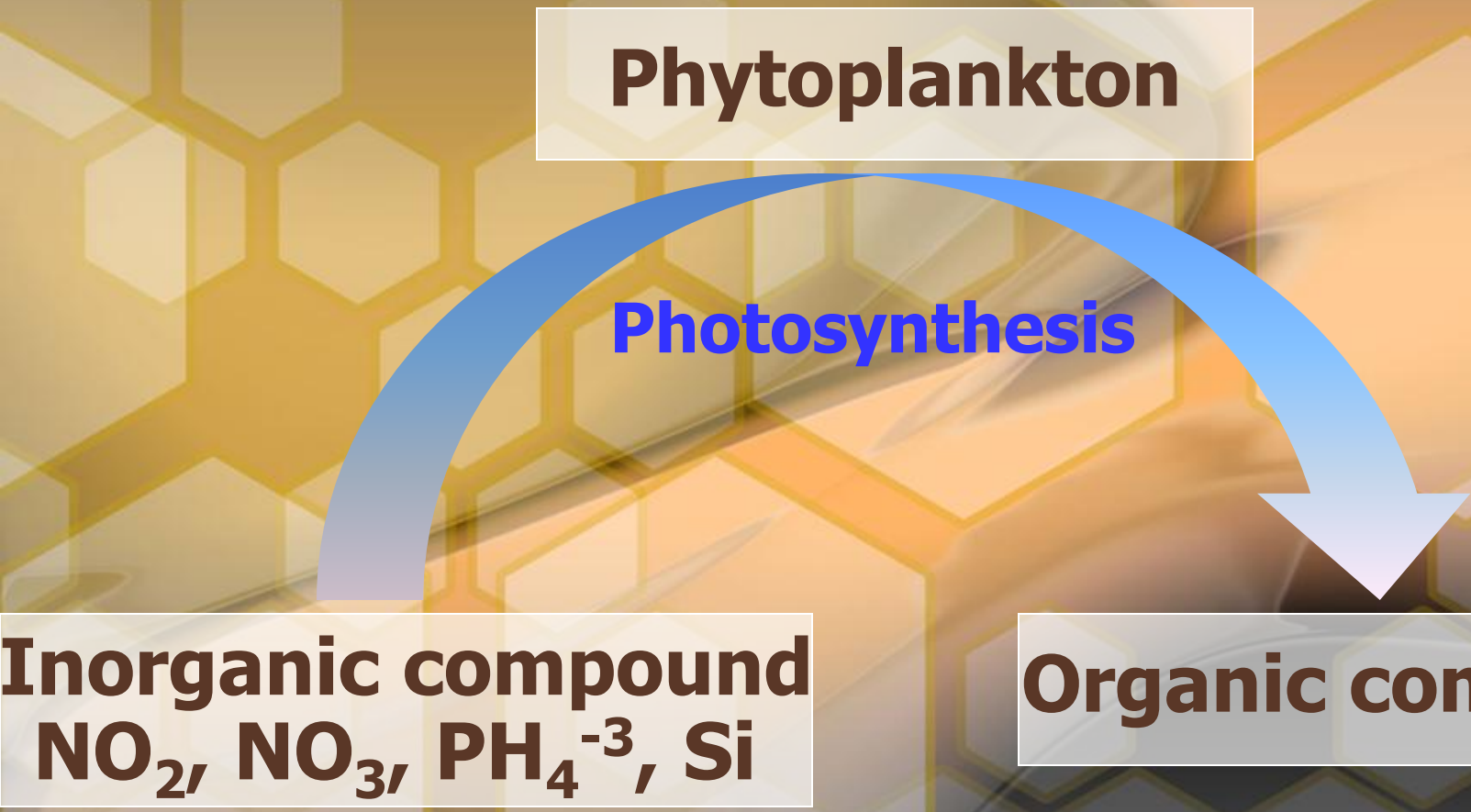
Thermal front

White-sided dolphin in Californian

(Tetley, 2004)



Chlorophyll-a concentration



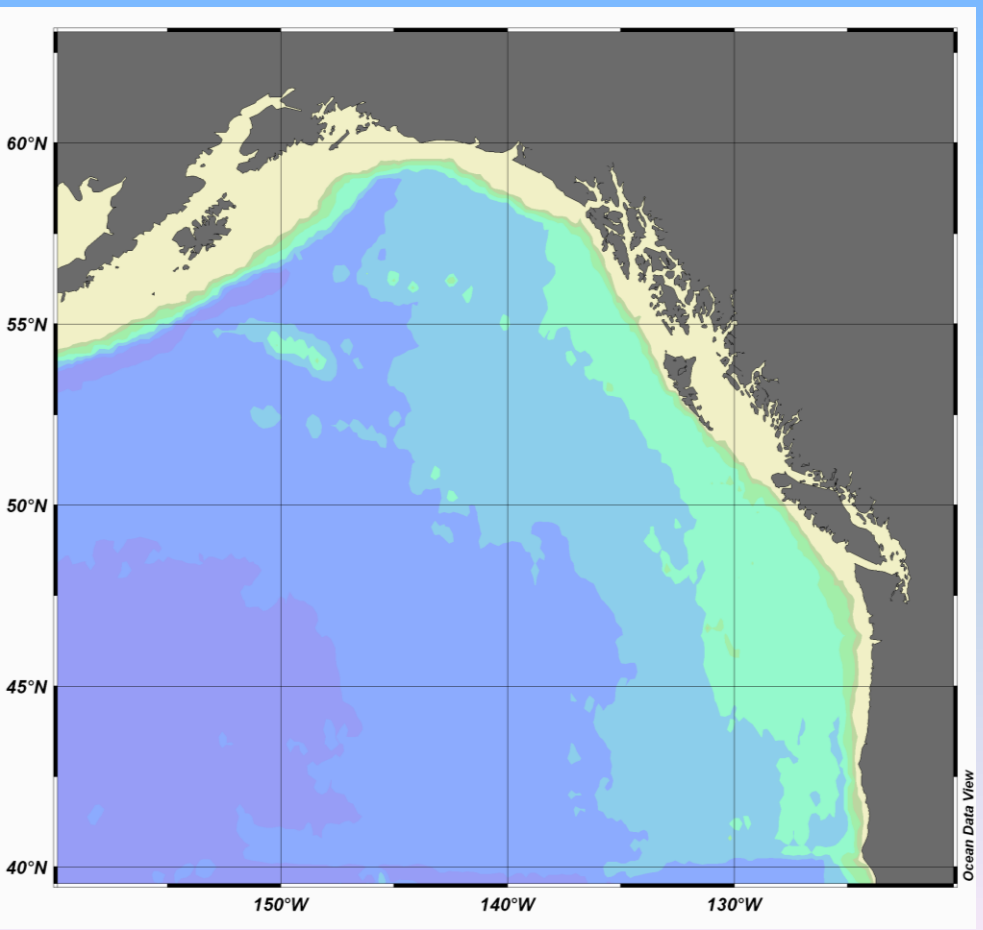
Chlorophyll-a concentration

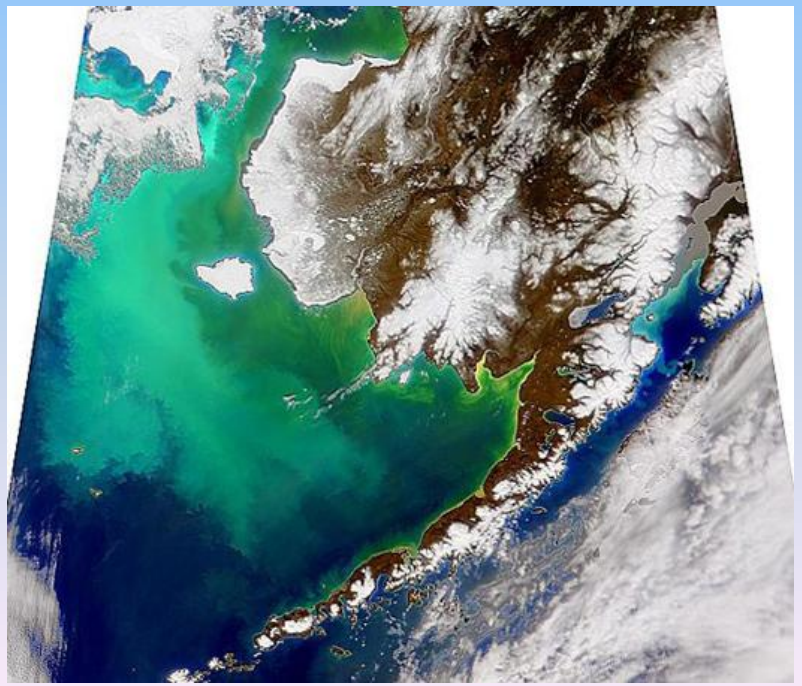
Class	Chlorophyll-a	Chlorophyll-b	Chlorophyll-c
Cyanophyta	X	-	-
Chlorophyta	X	X	-
Chrysophyta	X	-	X
Bacillariophyta	X	-	X
Pyrrophyta	X	-	X
Cryptophyta	X	-	X
Euglenophyta	X	X	-

Chlorophyll-a concentration

Blue whale in the eastern North Pacific

(Burtenshaw *et al*, 2004)





Depth

Harbour porpoise 100 m.

Blue whale 200 m.

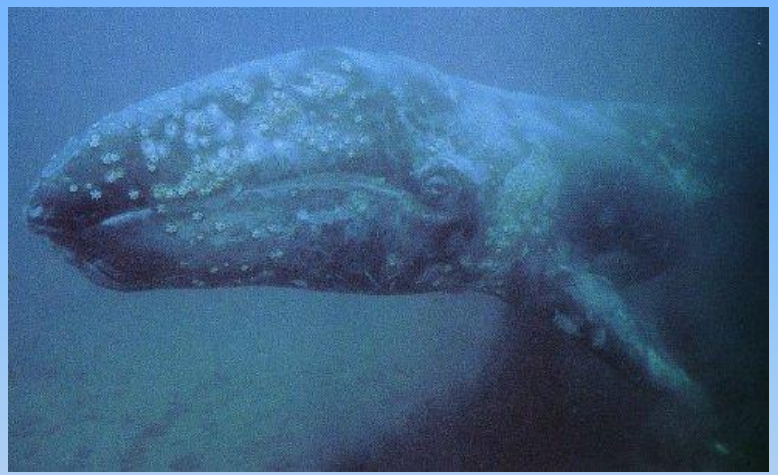
Fin whale 450 m.

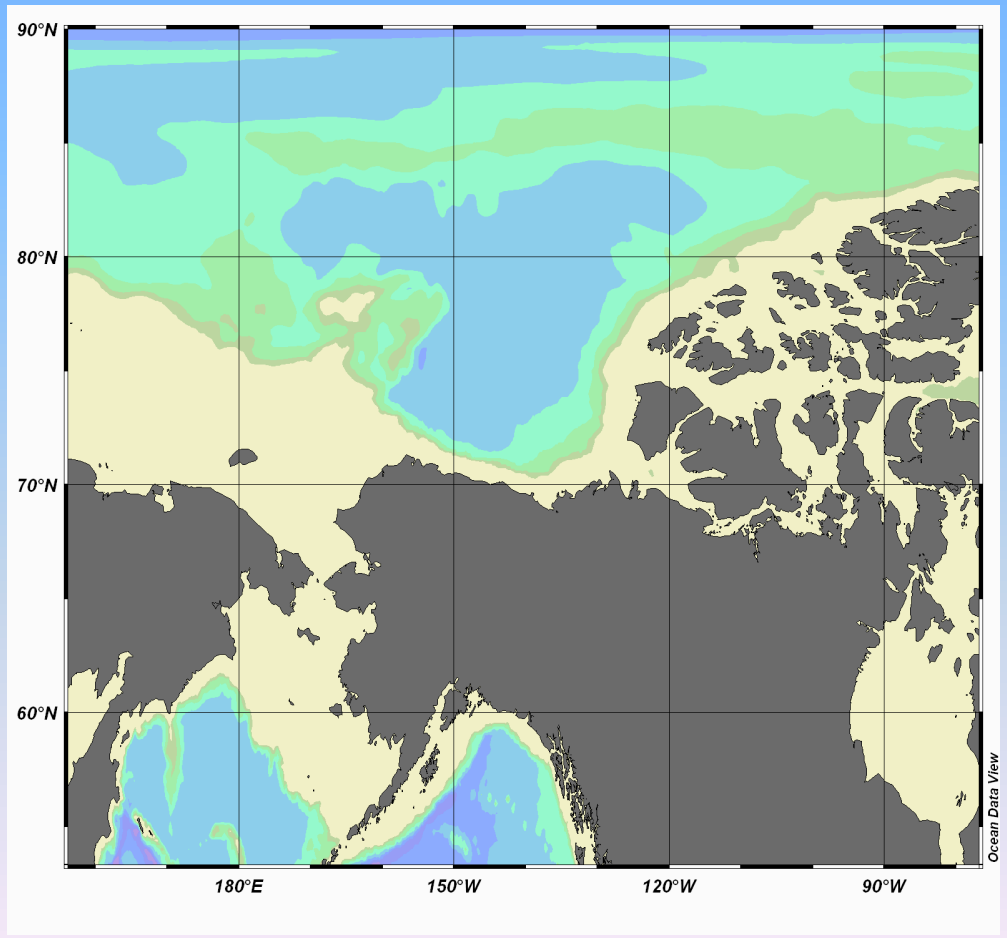
Sperm whale 2000 m.

Cetaceans are limited in their abilities to inhabit the ocean depth by need to return to surface regularly to breathe

Depth

Gray whale and Beluga whale in the Alaskan Arctic (Moore and DeMaster, 1998)





Thank you