



Seamount Effects on Micronekton at a Subtropical Central Pacific Seamount*

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Pelagic Fisheries Research Program



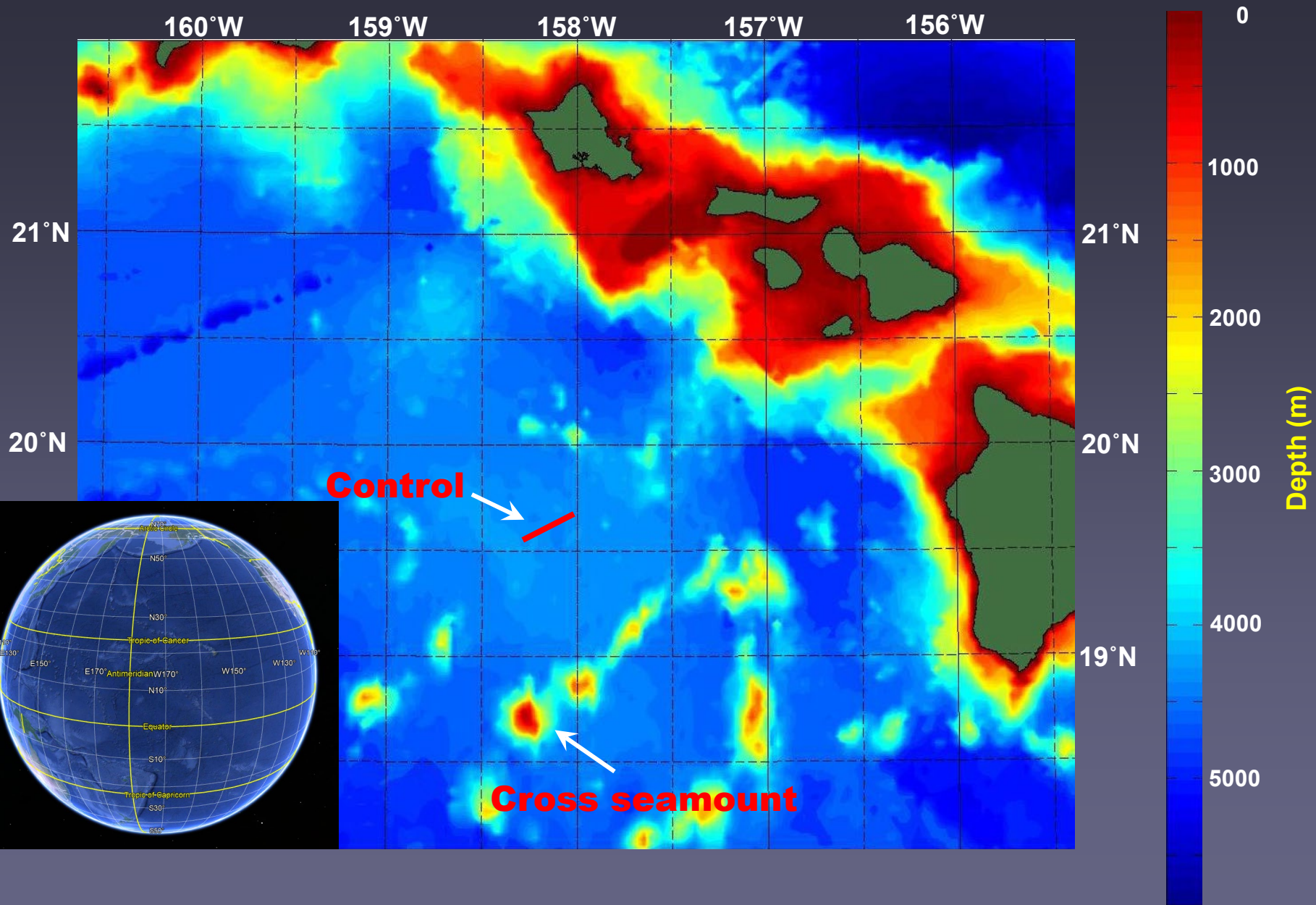
*Réka Domokos (2022) Deep-Sea Research I., 186

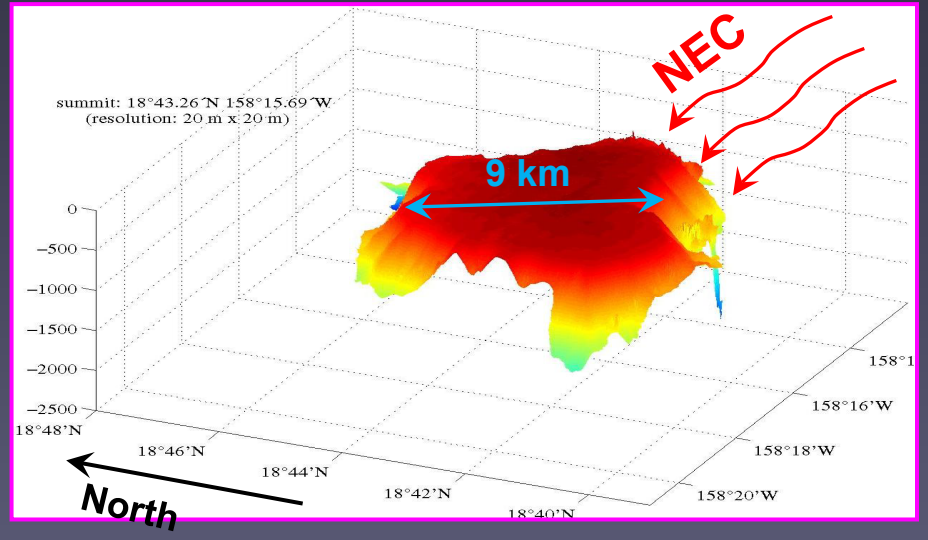
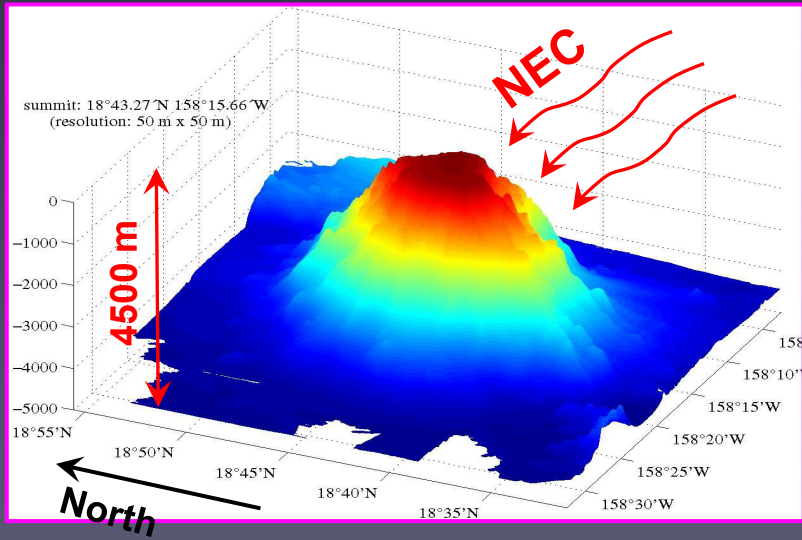
<https://doi.org/10.1016/j.dsr.2022.103829>



Focus: intermediate depth seamounts

- Intermediate seamounts are typically
 - not chlorophyll enhancing
 - support enhanced biomass and diversity
 - what are the mechanisms?







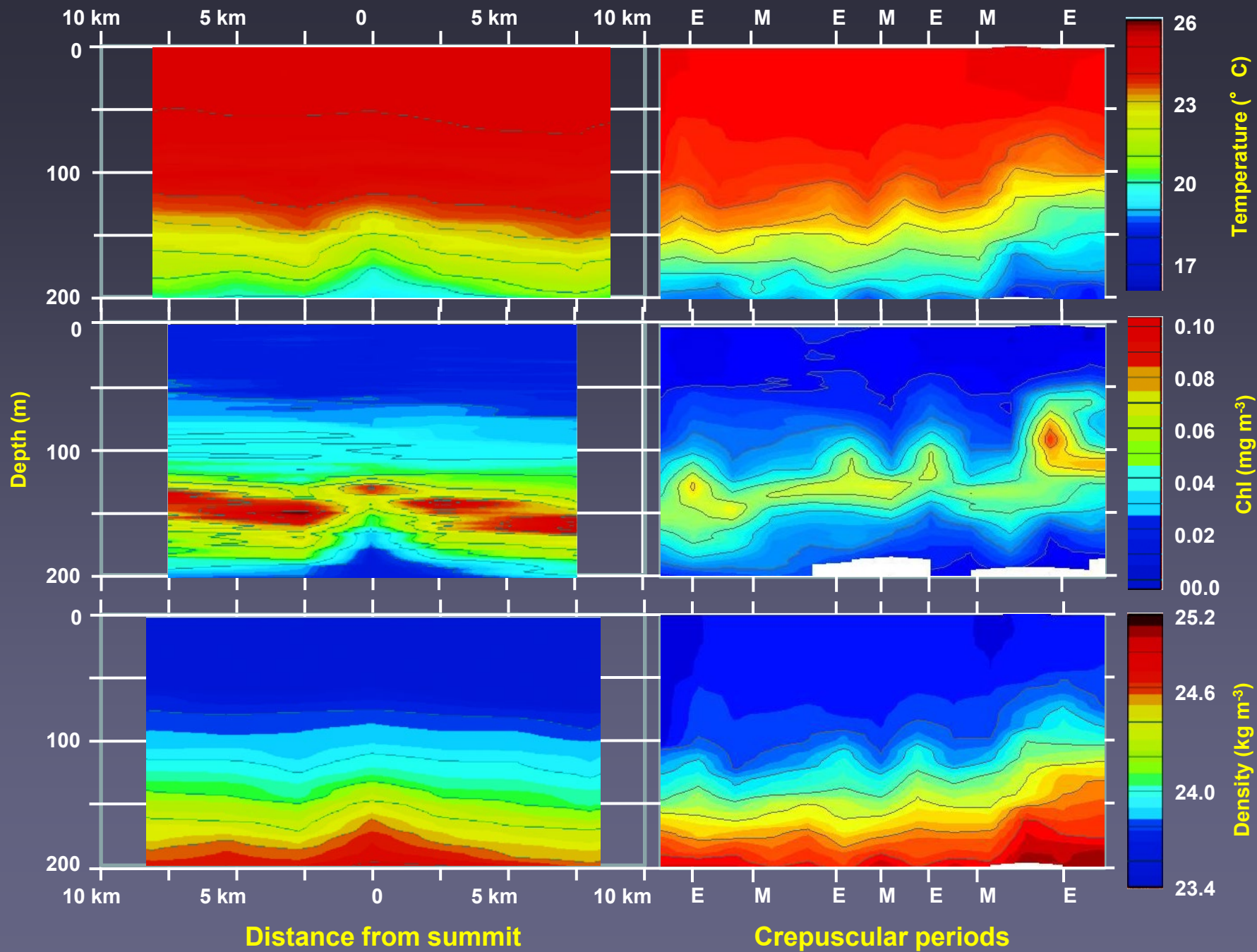
Cross Seamount





- **Juvenile bigeye targeted by local fishers**
 - **meeting/navigational/orientation stop?**
 - **foraging spot?**
- **Is chlorophyll or forage biomass/composition enhanced/changed at Cross?**

NOAA Ship *Oscar Elton Sette*



- **Three springtime surveys (2005, 2007, 2009)**
- **Micronekton:**
 - **Simrad EK60 system (38, 70, & 120 kHz)**
- **Environment:**
 - **ADCP (75 kHz)**
 - **CTD (Temp, Sal, O₂, ρ, Chl-a)**



0 – 200 m 
 200 – 400 m 
 400 – 600 m 
 600 – 800 m 

2005

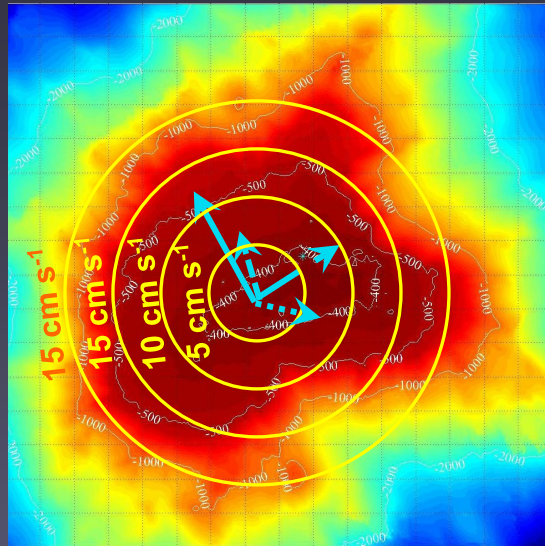
2007

2008

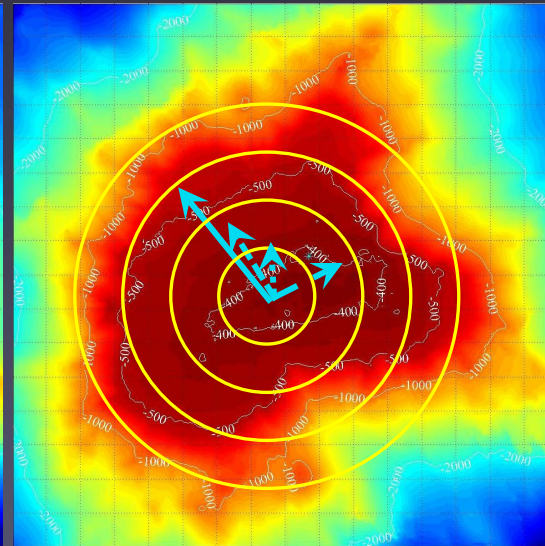
18°46'N

18°43'N

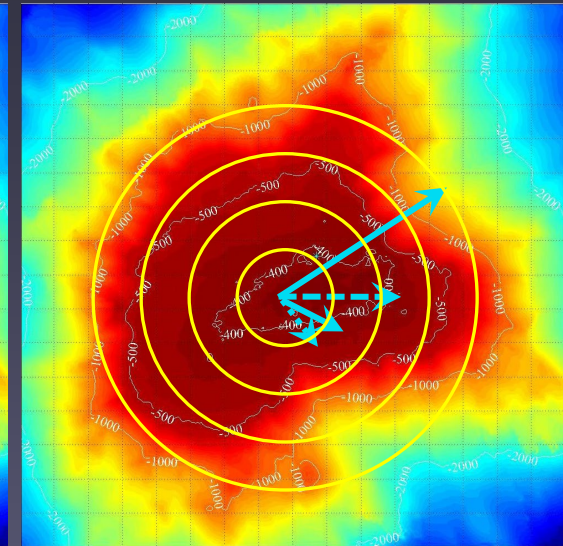
18°40'N



cyclonic flow (2005)



anticyclonic flow (2007)



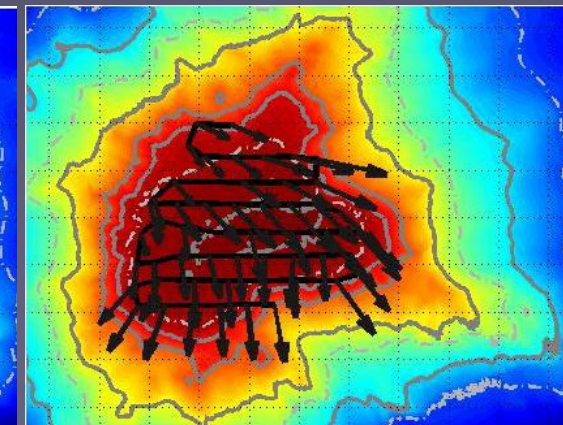
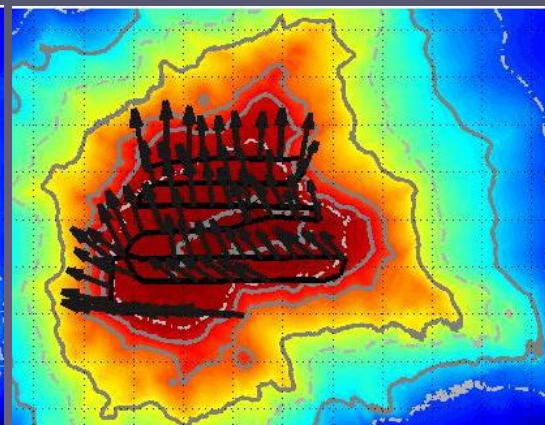
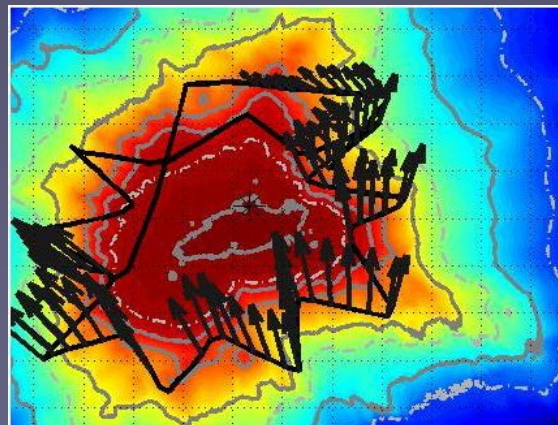
anticyclonic flow (2008)

18°46'N

18°44'N

18°42'N

18°40'N



0 – 200 m

158°20'W

158°15'W

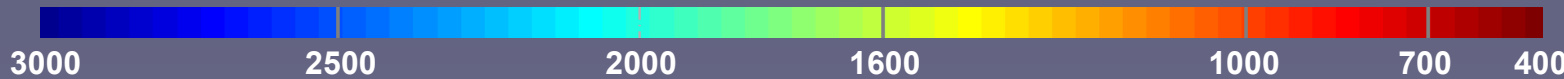
158°10'W

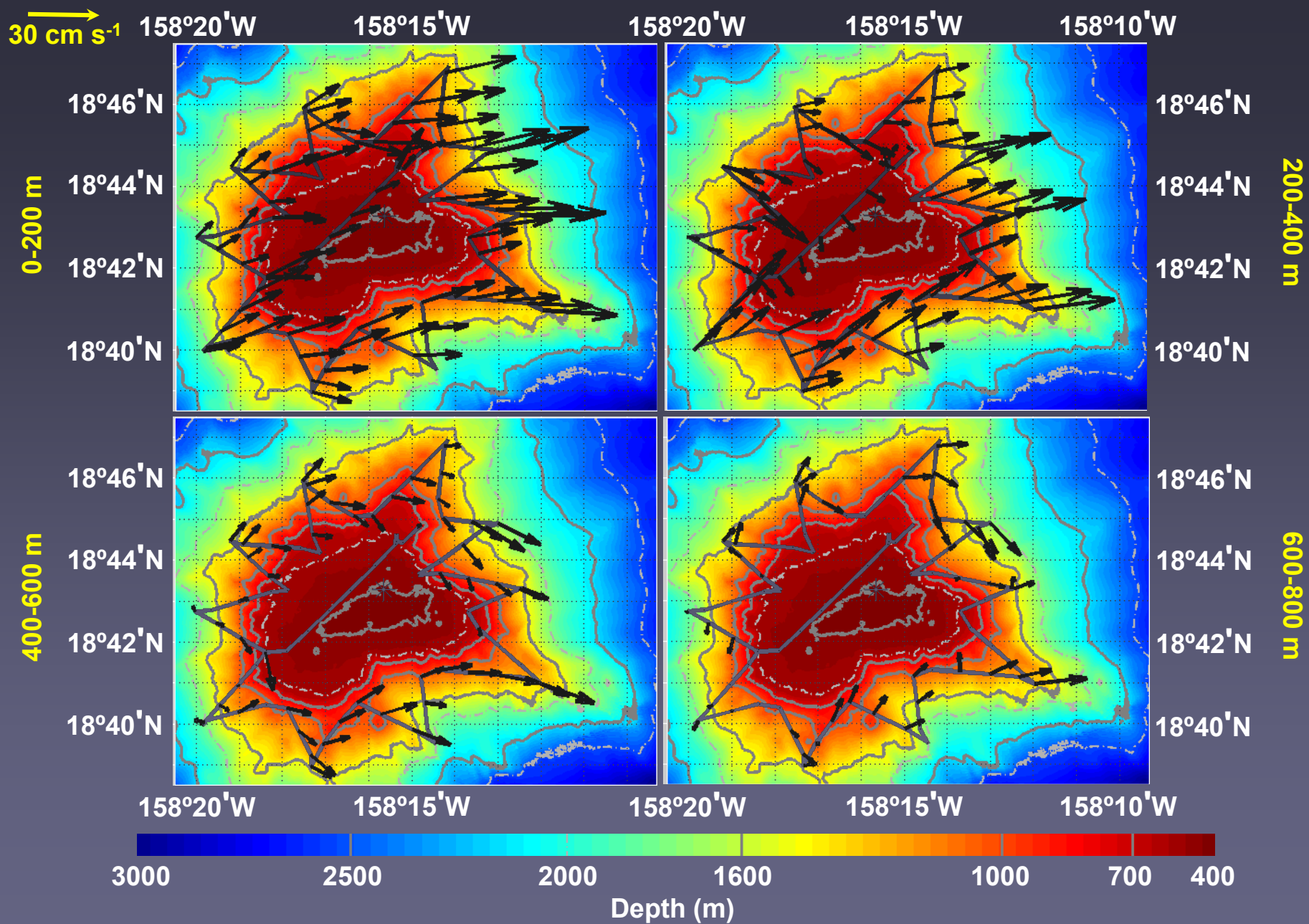
158°15'W

158°10'W

158°15'W

158°10'W





Taylor cap conditions: $R0 \leq \sim 0.17$, blocking parameter, $2 < BI < 10$ (BI), and Burger number, $B \gg 1$

Cross: $0.11 \leq R0 \leq 0.15$, $6.1 \leq BI \leq 8.3$, and $B = 9.5 \cdot 10^4$

Daytime

Cross Seamount

Control

5km

10km

5km

10km

15km

38kHz

70kHz

0m

200m

400m

600m

800m

1000m

200m

400m

600m

800m

11:30

11:45

12:00

13:00

13:15

13:30

13:45

-80

-77

-74

-71

-68

-65

-62

-59

-56

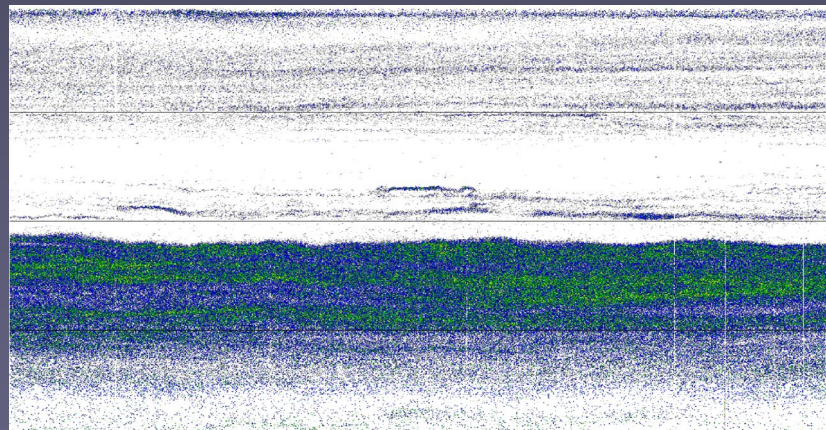
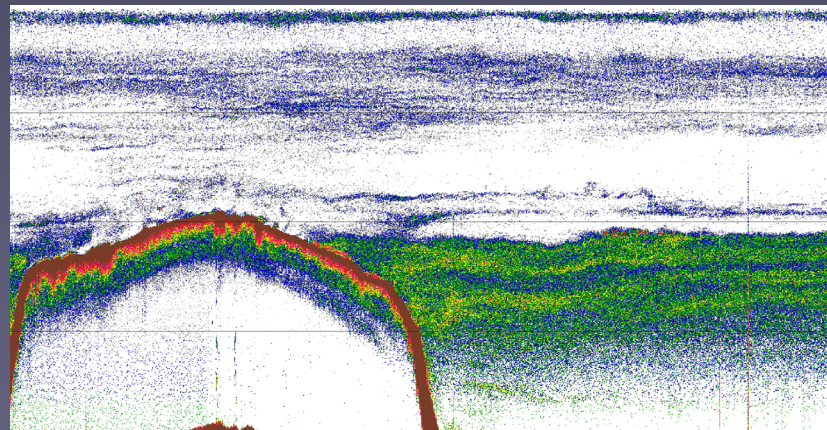
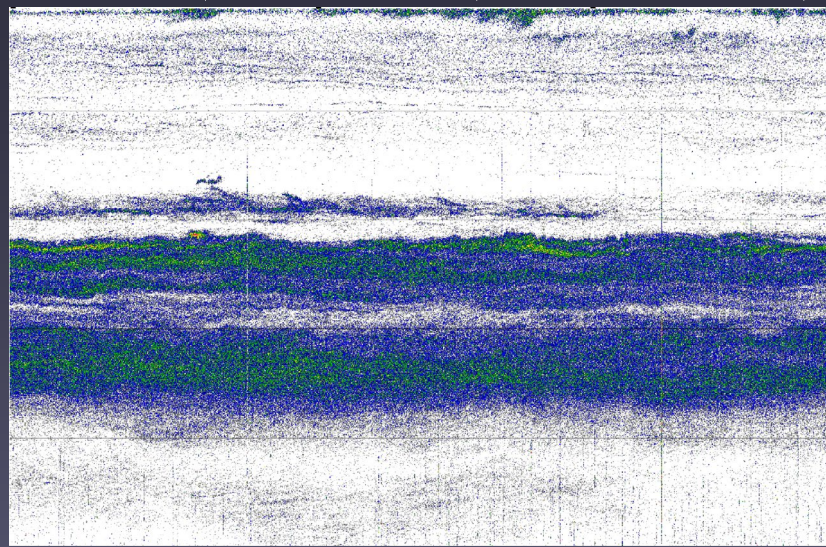
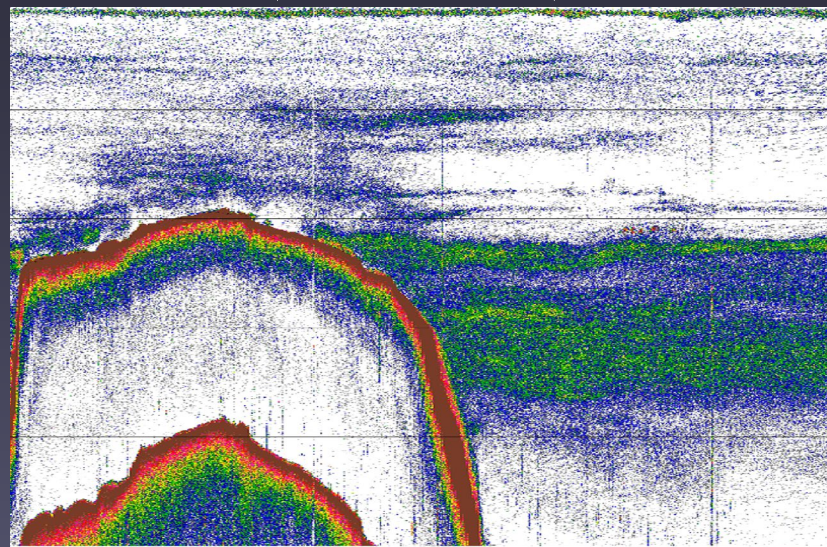
-53

-50

-47

-44

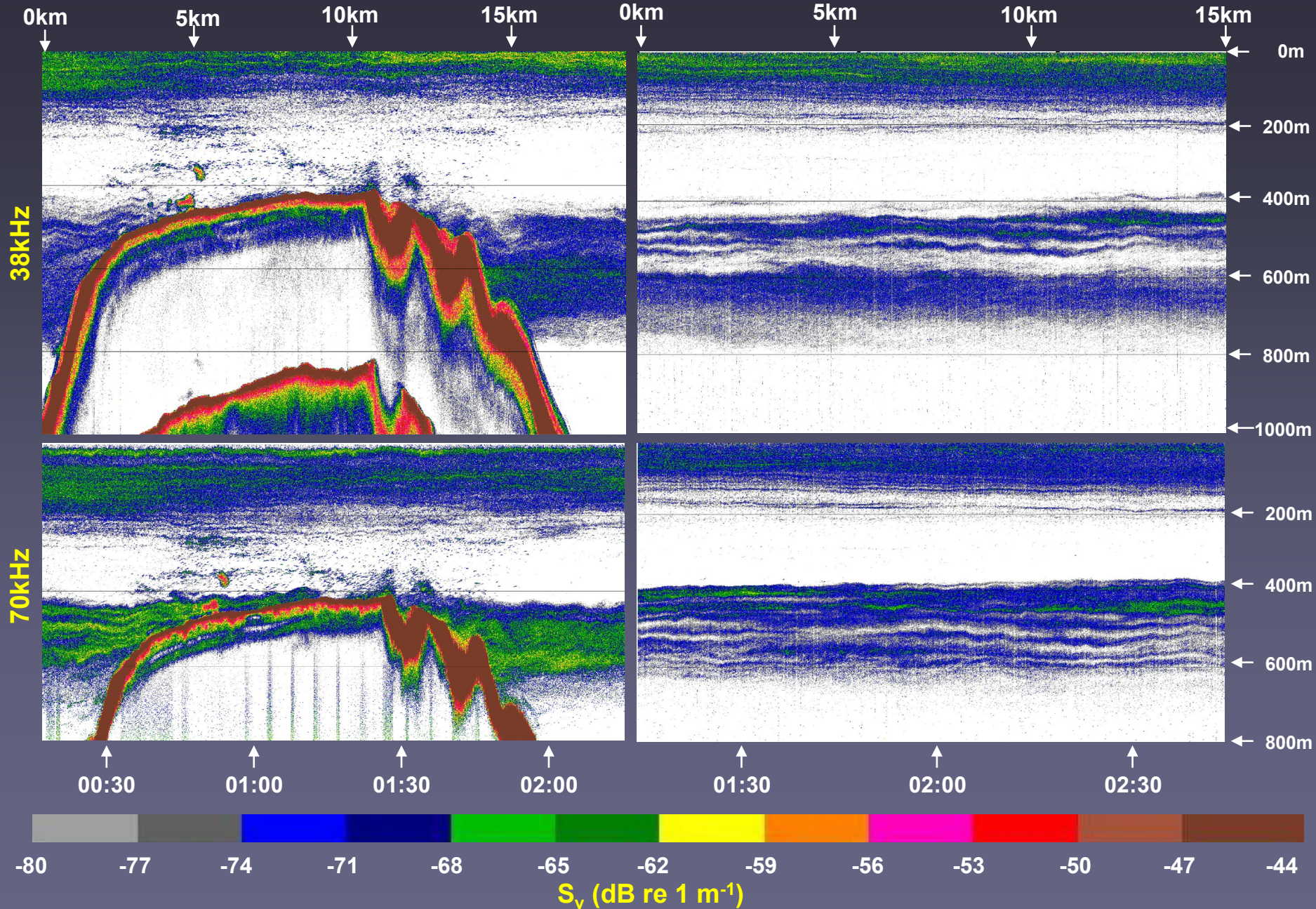
S_v (dB re 1 m⁻¹)



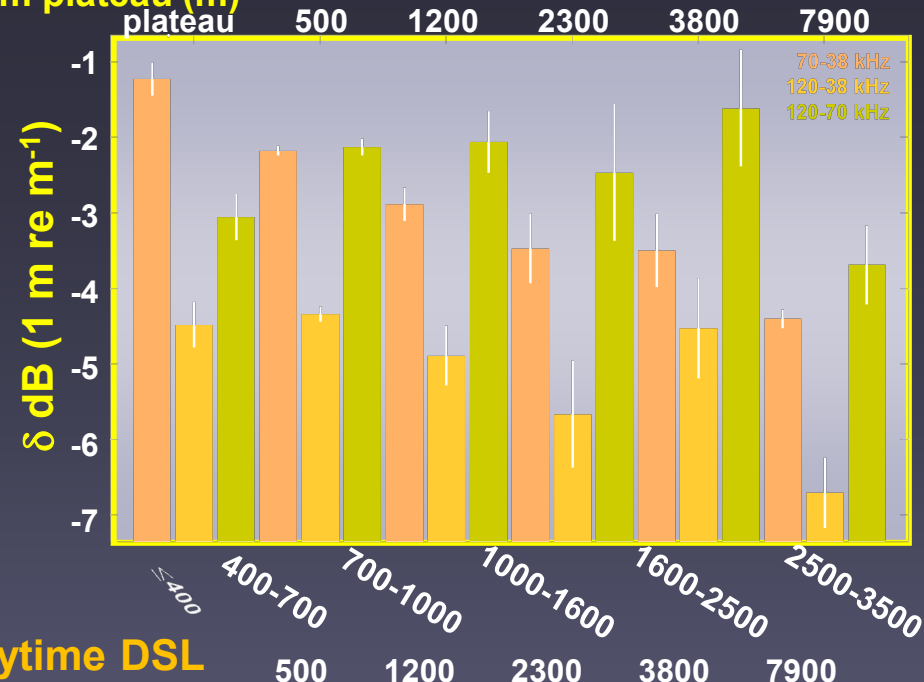
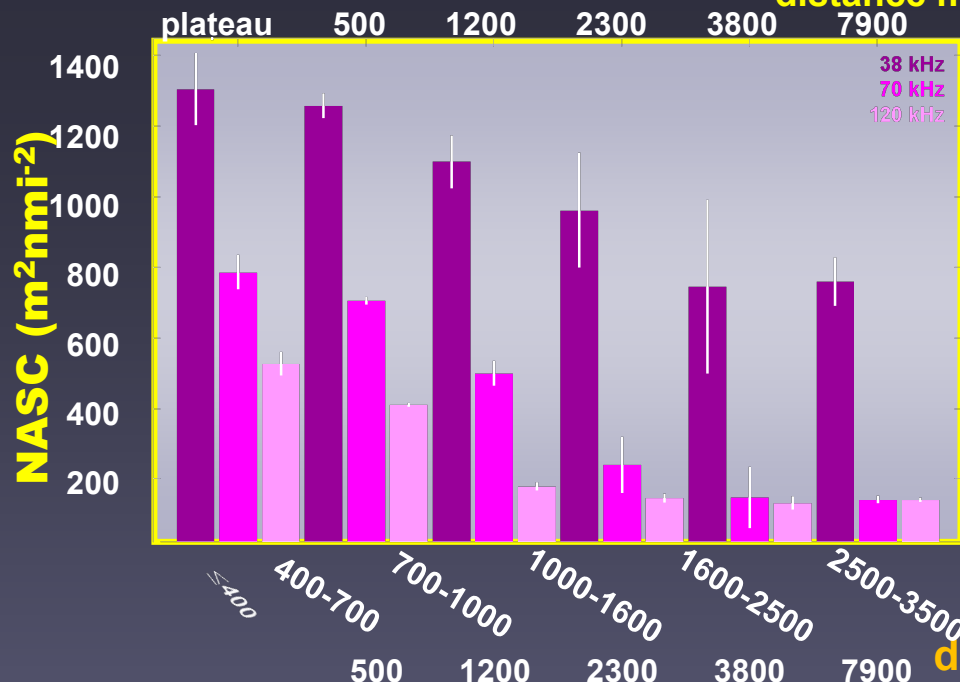
Nighttime

Cross Seamount

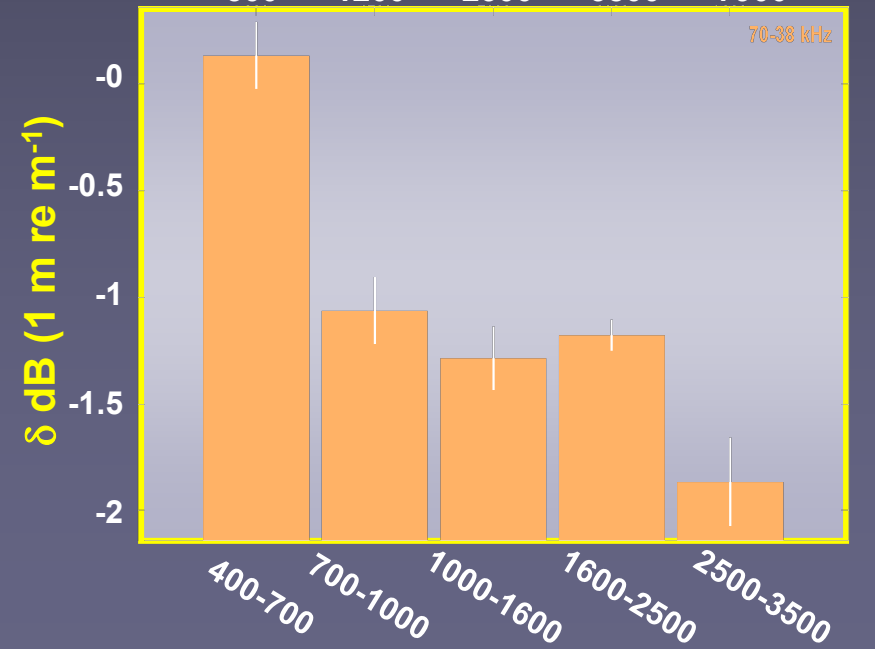
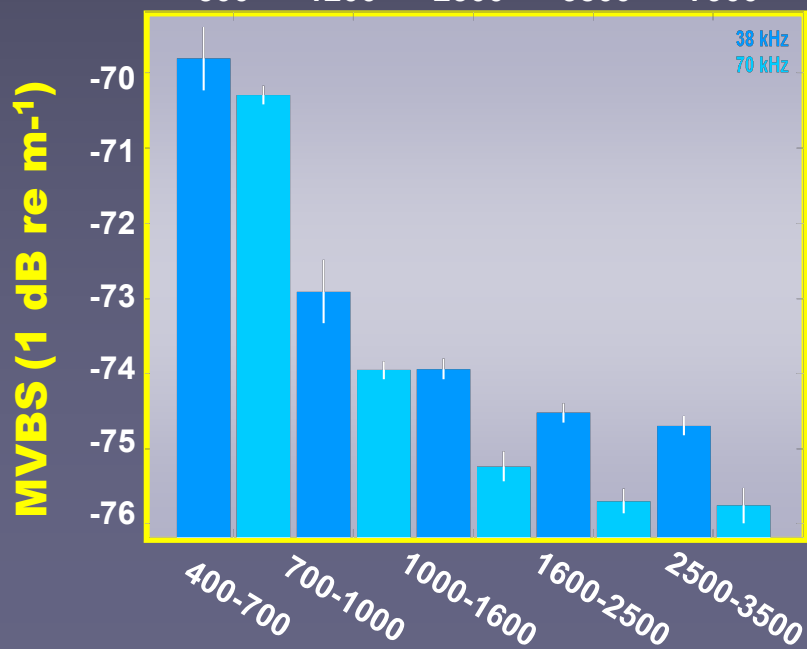
Control



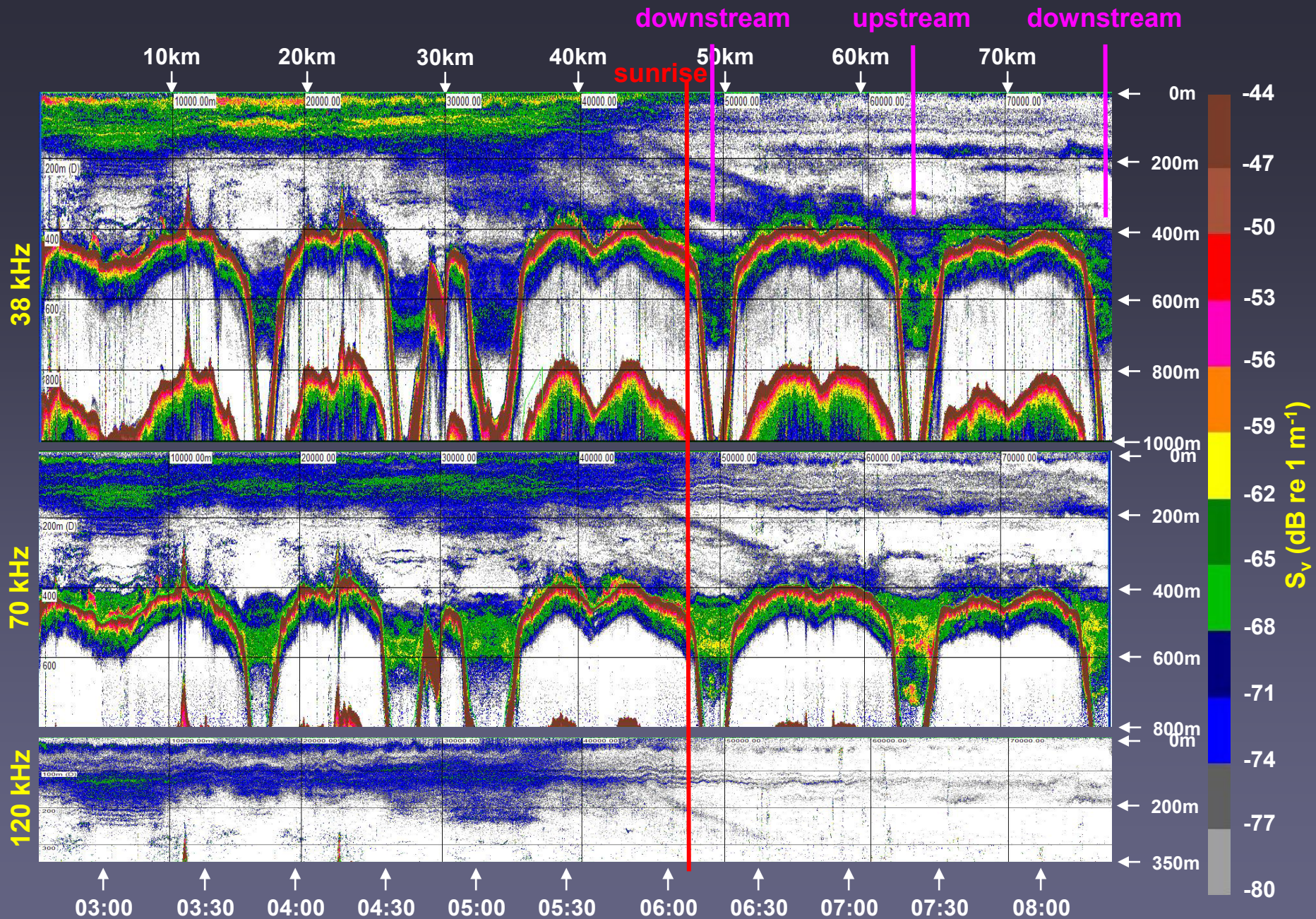
nighttime SSL distance from plateau (m)

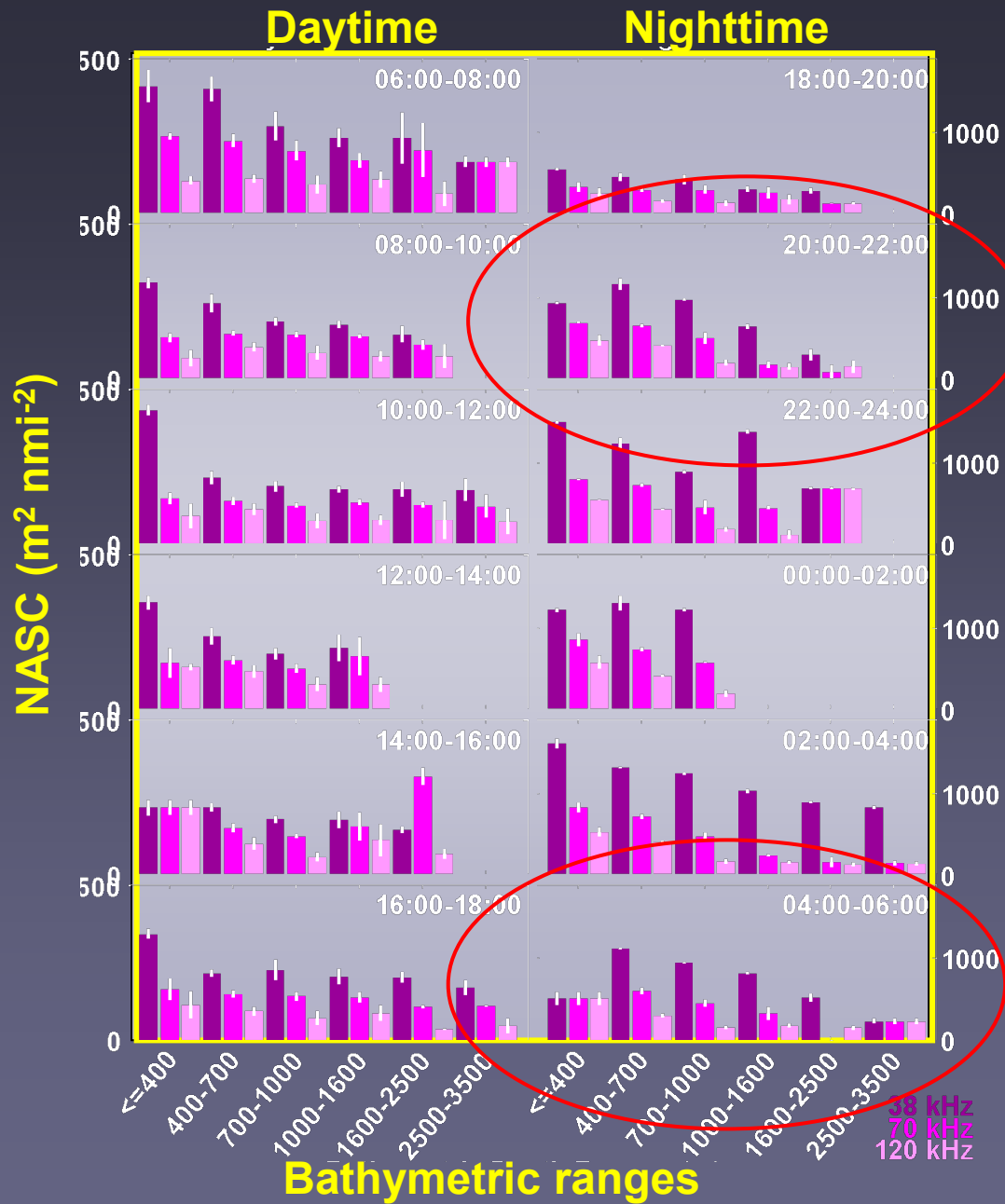


daytime DSL



bathymetric range (m)







Summary

- **Cross Seamount is not Chl-a enhancing**
- **Evidence of (mostly anticyclonic) rotary flow and semipermanent Taylor caps**
- **Increased micronekton biomass with different composition**
 - **Evidence of micronekton activity swimming against currents**
 - **Data indicate presence of resident species**
- **Possible mechanism: rotary flow and Taylor caps advect zooplankton – forage for micronekton?**