MLE Parameterization in CCSM and Competition
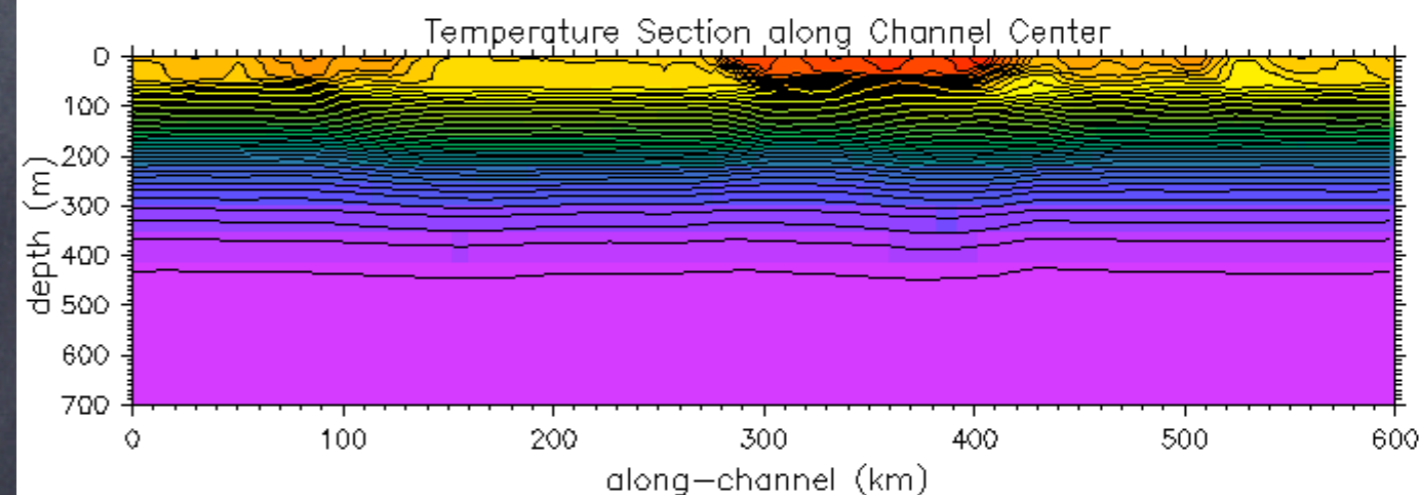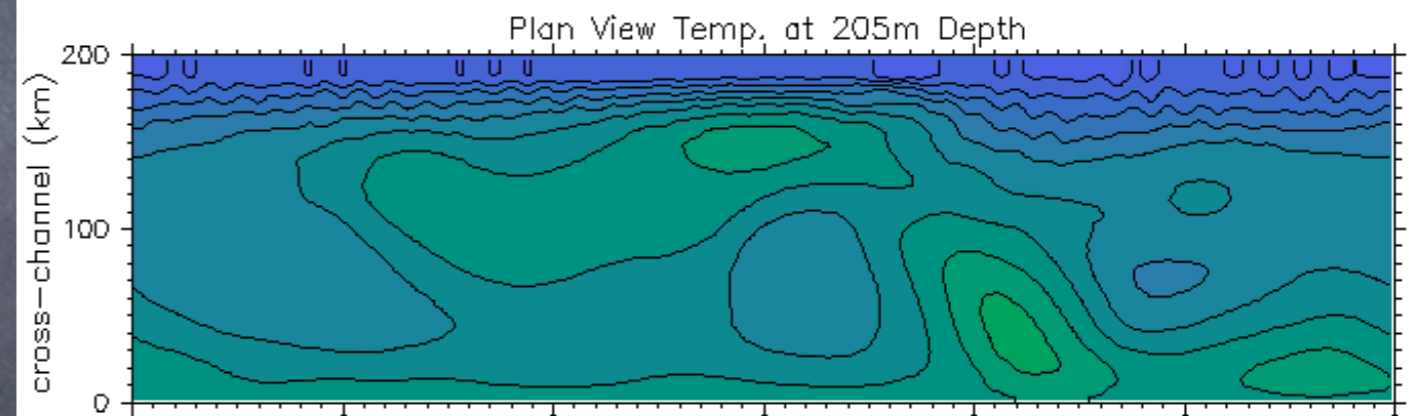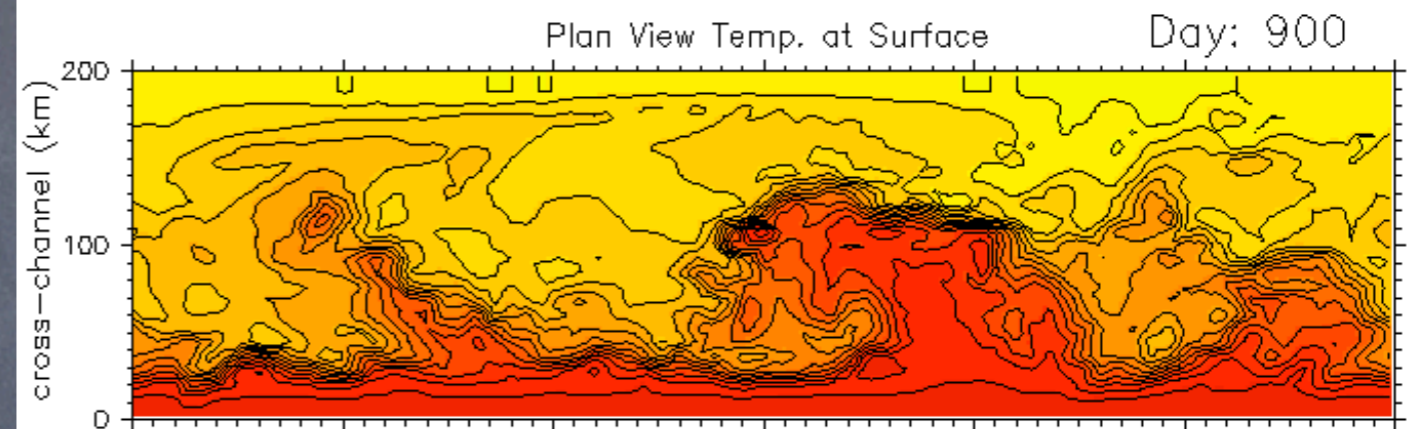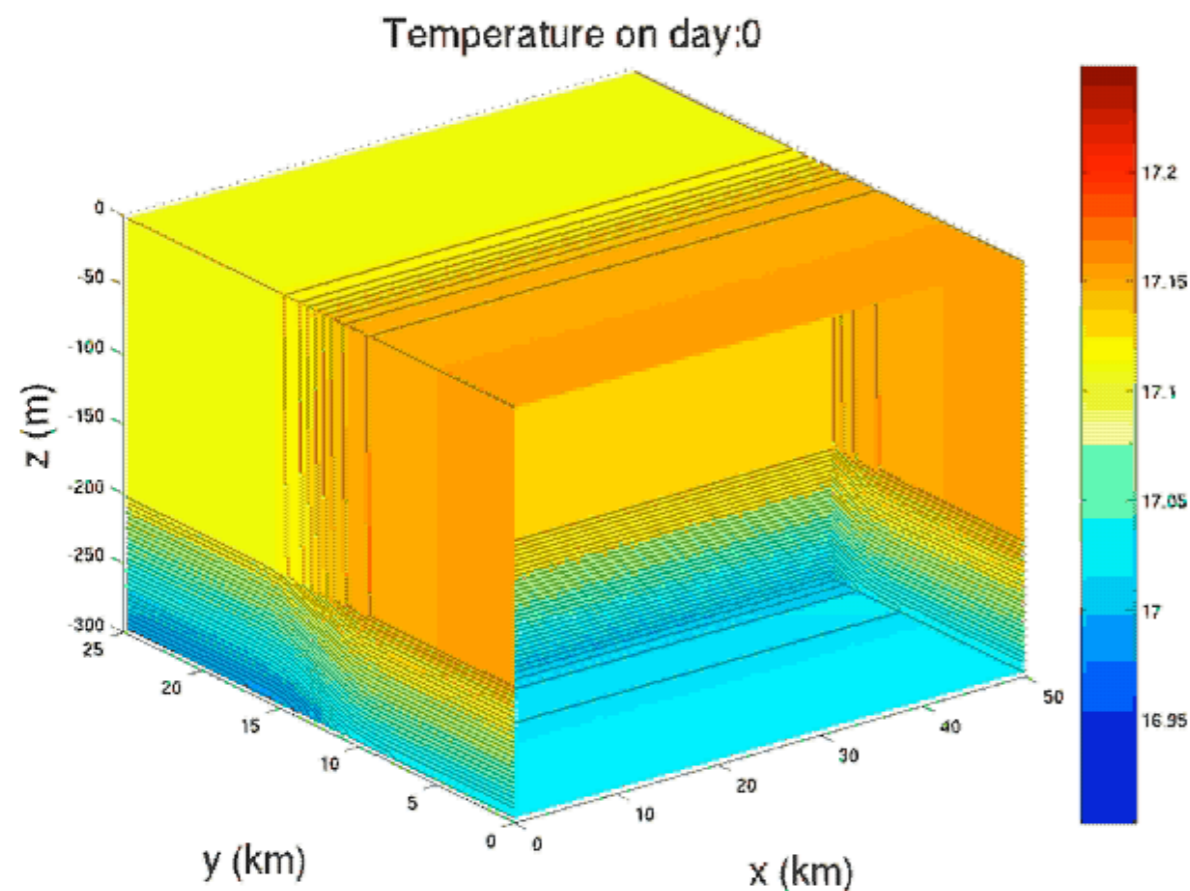
Baylor Fox-Kemper
CIRES/CU-Boulder
and
G. Danabasoglu, R. Ferrari, R. Hallberg, S. Griffies, S. Peacock
13th CCSM Meeting--OMWG Session
Thurs. 6/19/08 11:40-Lunch

Recall MLE Param.

$$\Psi = \frac{C_e H^2 \mu(z)}{|f|} \nabla \bar{b} \times \hat{\mathbf{z}}$$
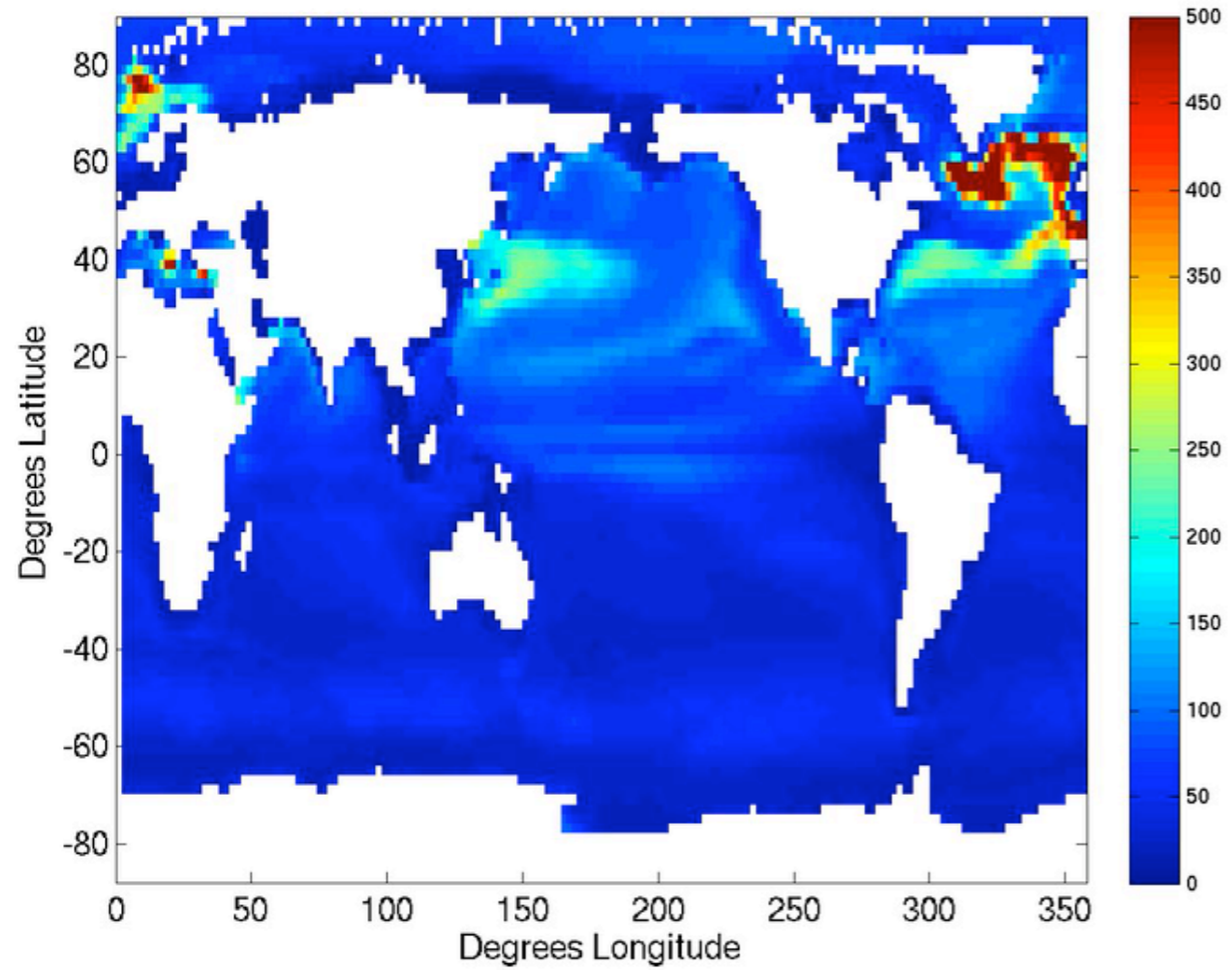
MLE Param. is now in testing in:

Models

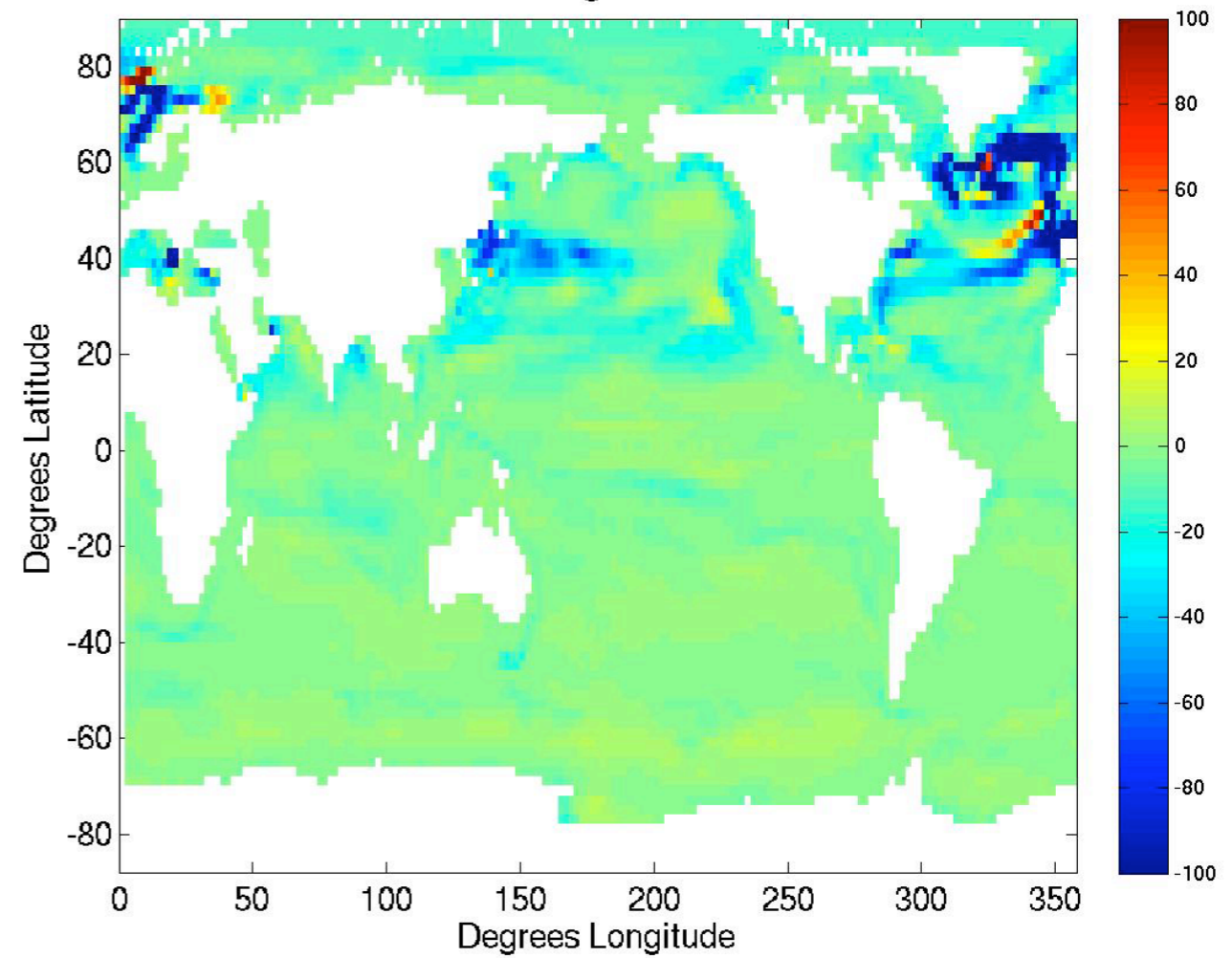- CCSM/POP
- CM/MOM
- CM/GOLD
- MITgcm

Results

- Reduced ML Depth
- Reduced MLD Bias
- Modest CFC changes, some bias reduction
- Reasonable changes to circulation
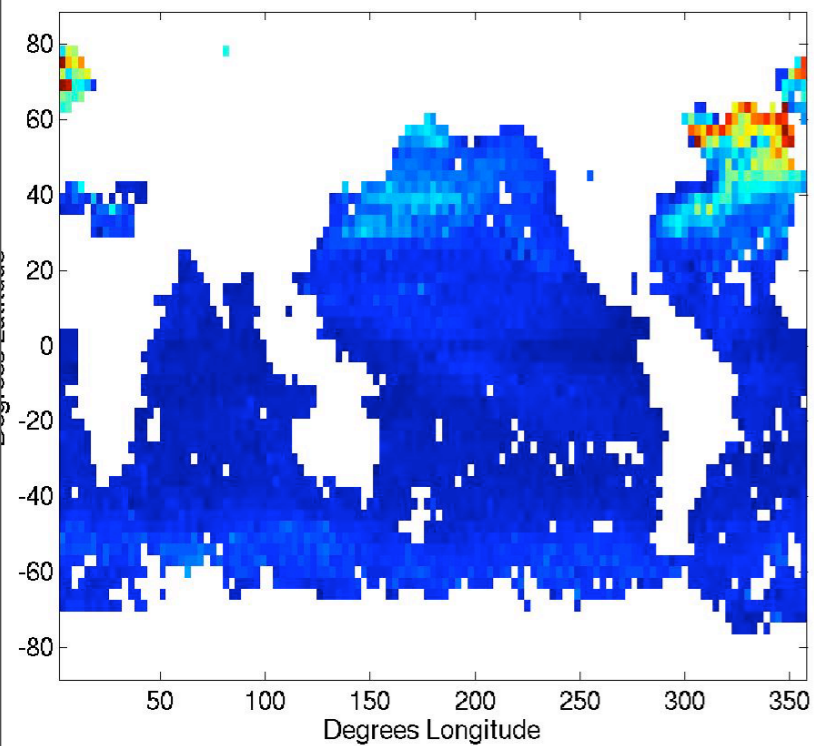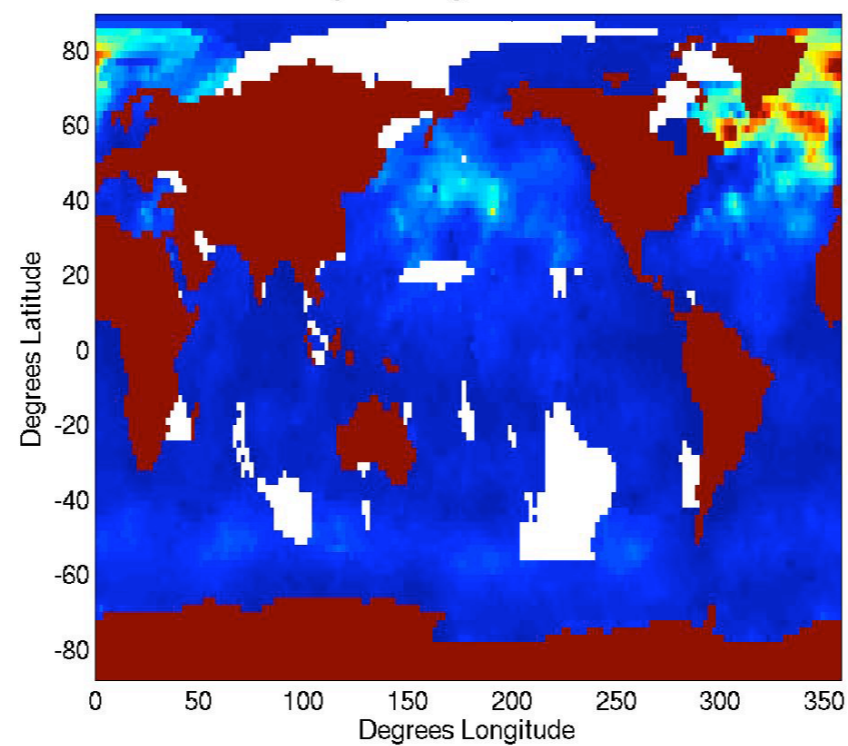- Stable, Minimal Cost

CCSM Control MLD JFM
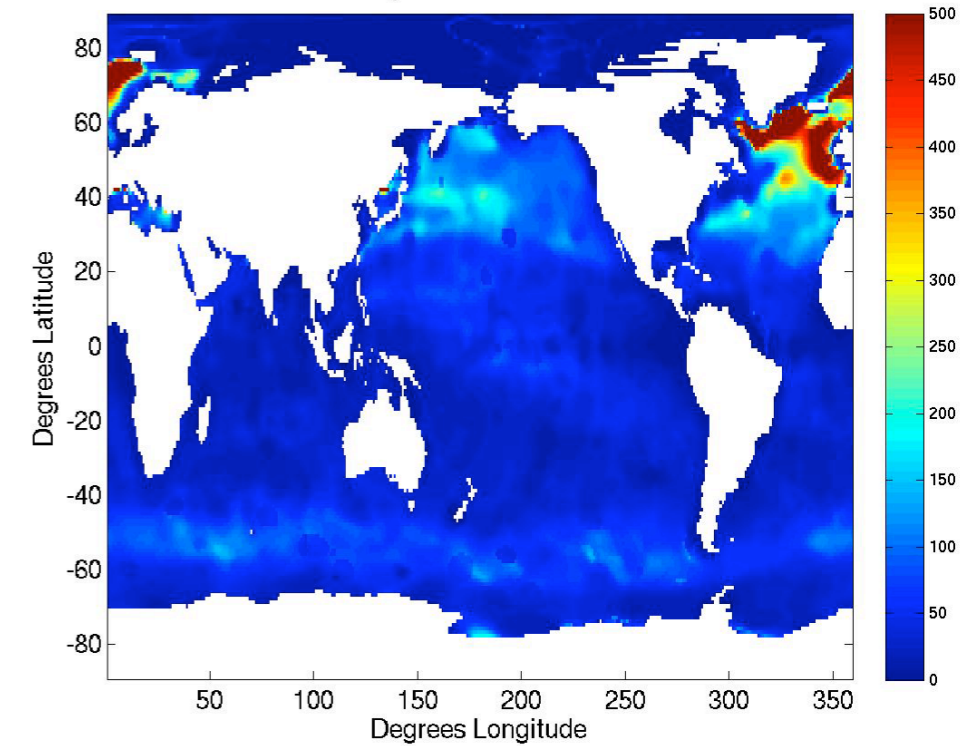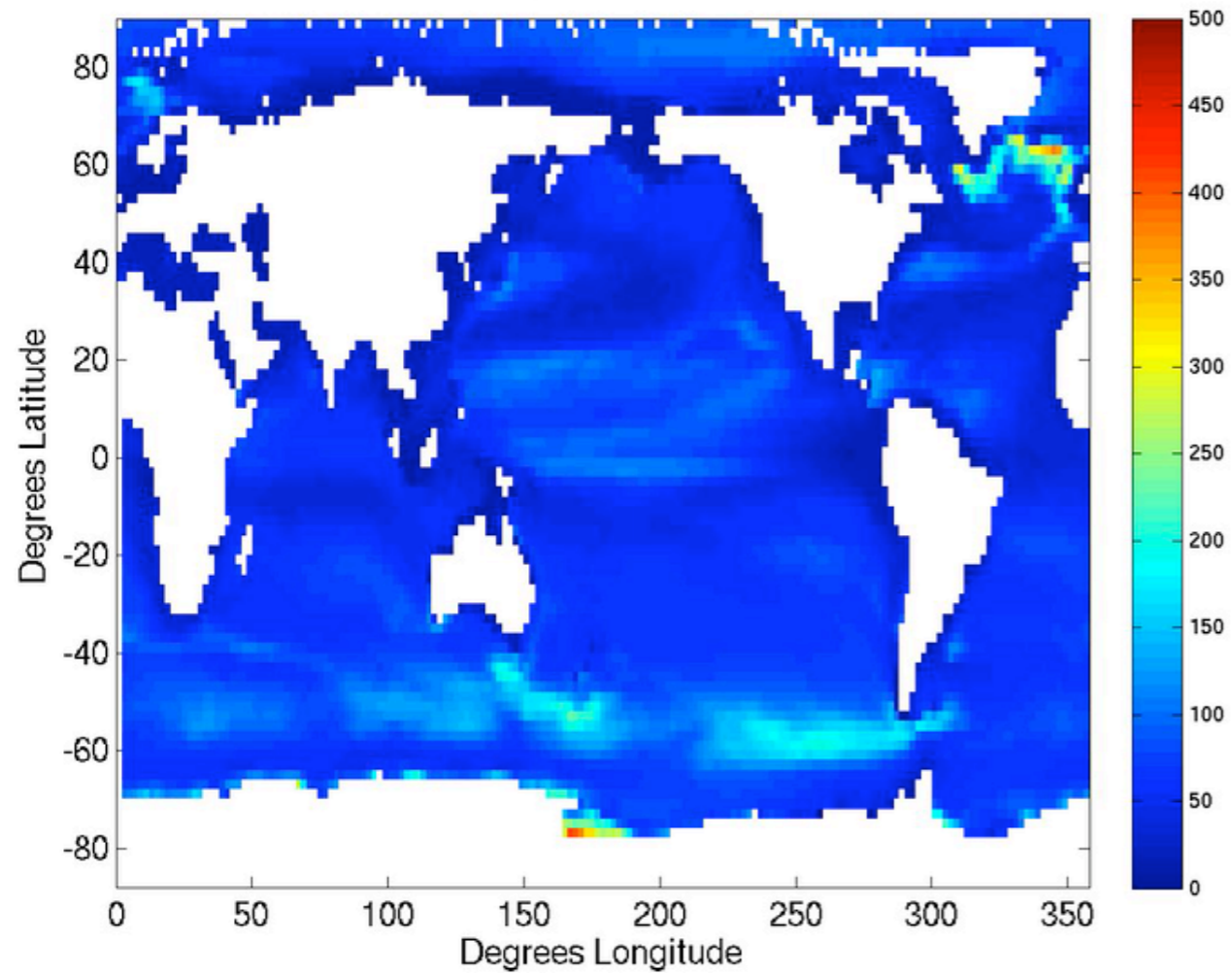
CCSM MLD change due to MLE JFM
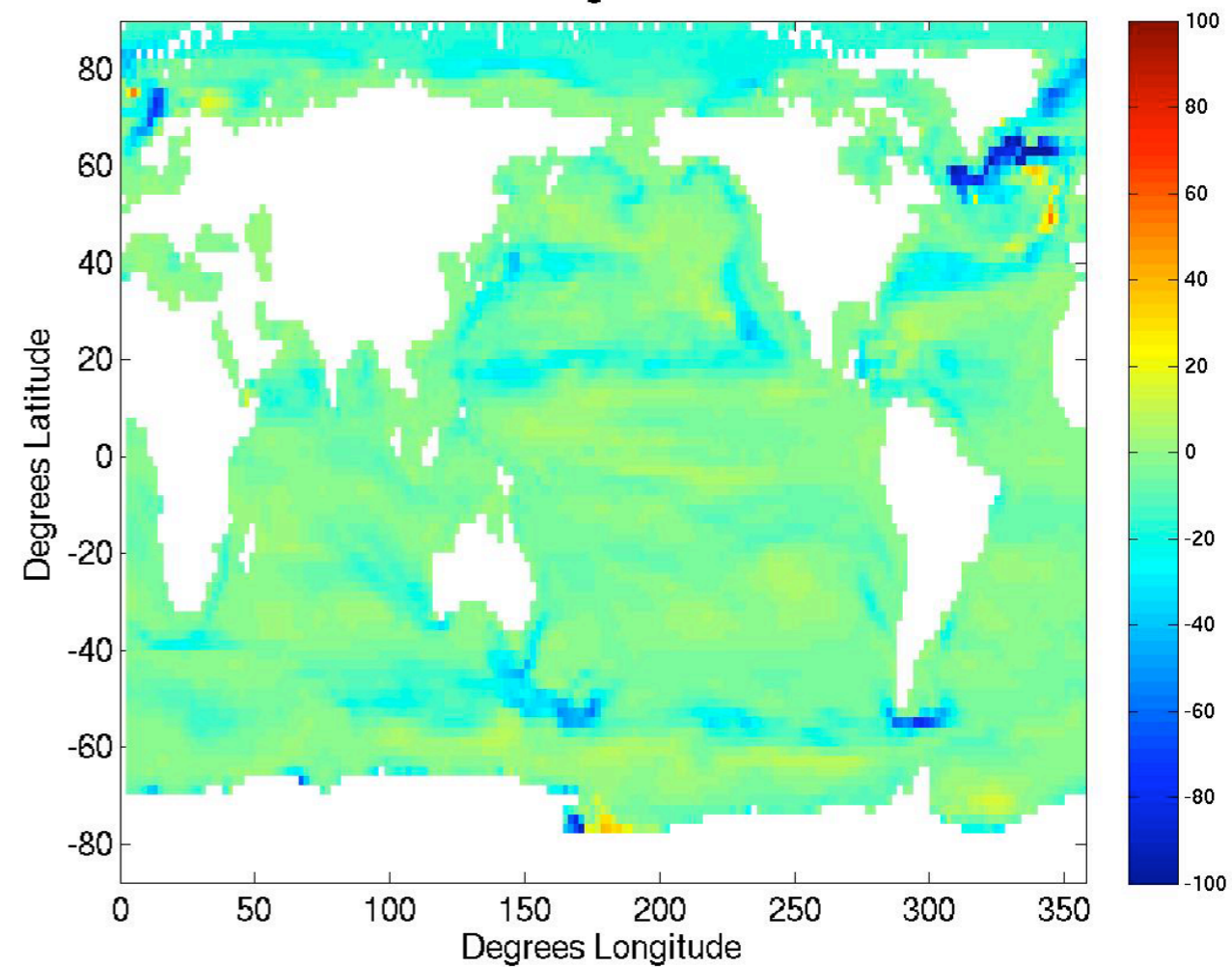
ARGO MLD JFM
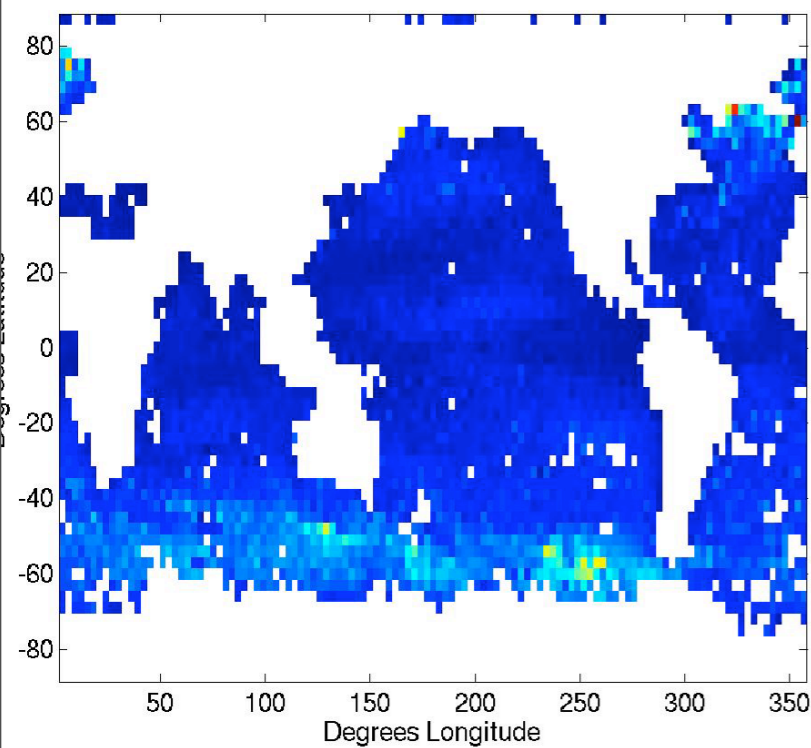
de Boyer-Montegut et al. MLD JFM

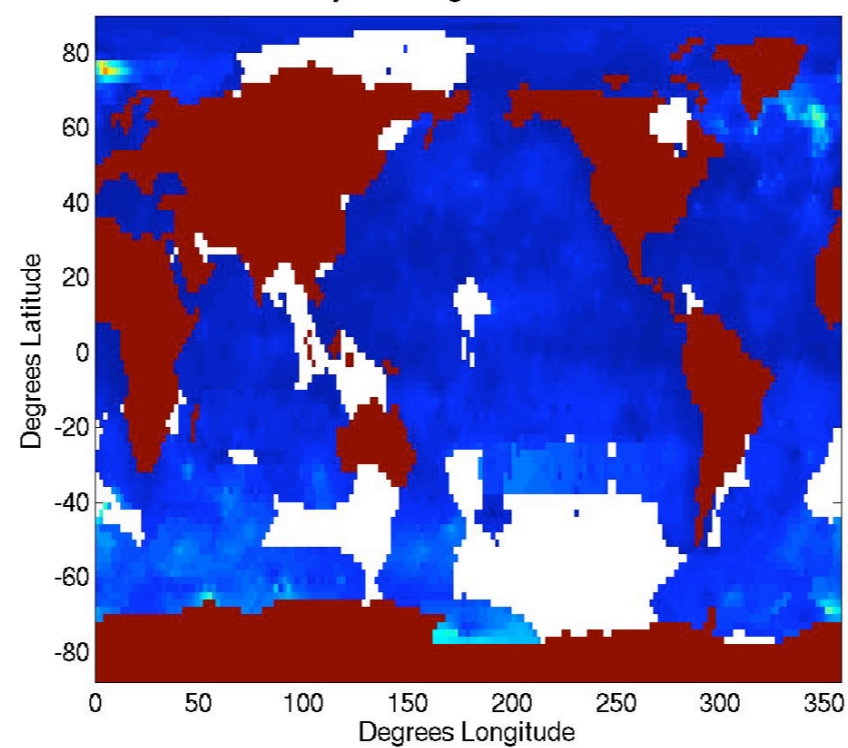Monterey and Levitus MLD JFM
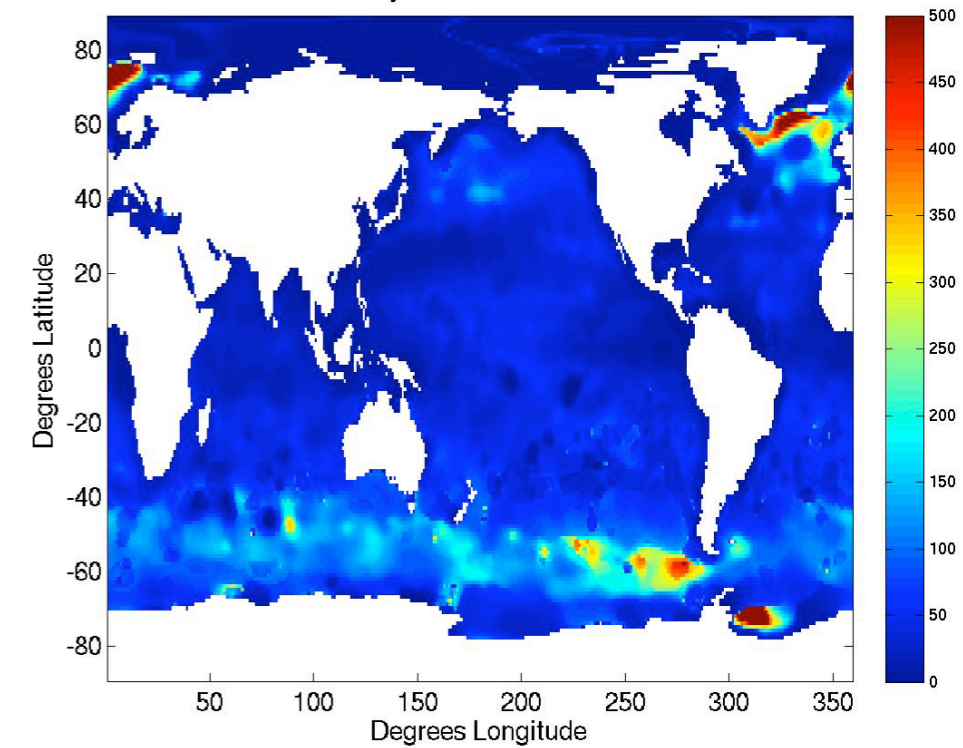
CCSM Control MLD AMJ

CCSM MLD change due to MLE AMJ
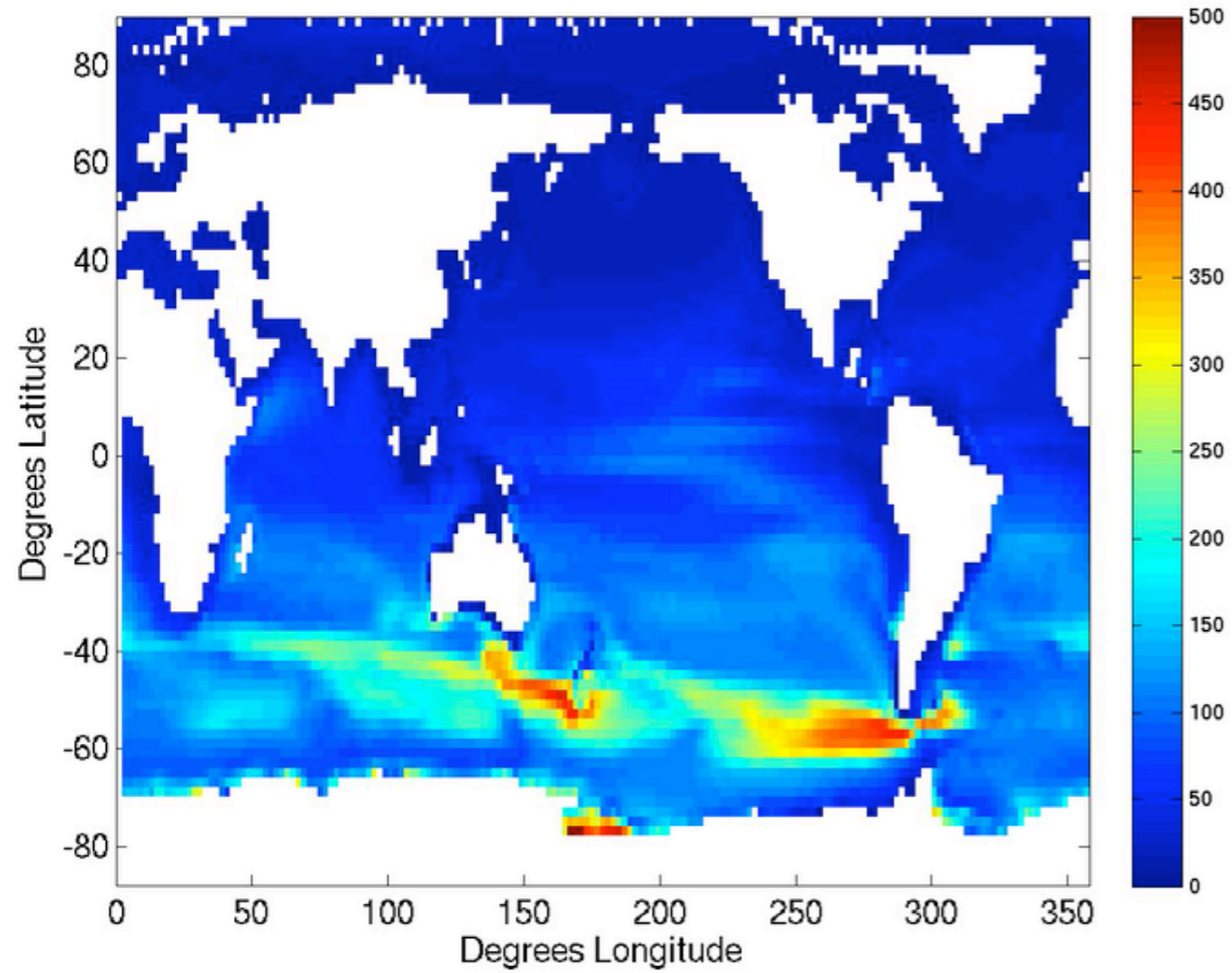
ARGO MLD AMJ

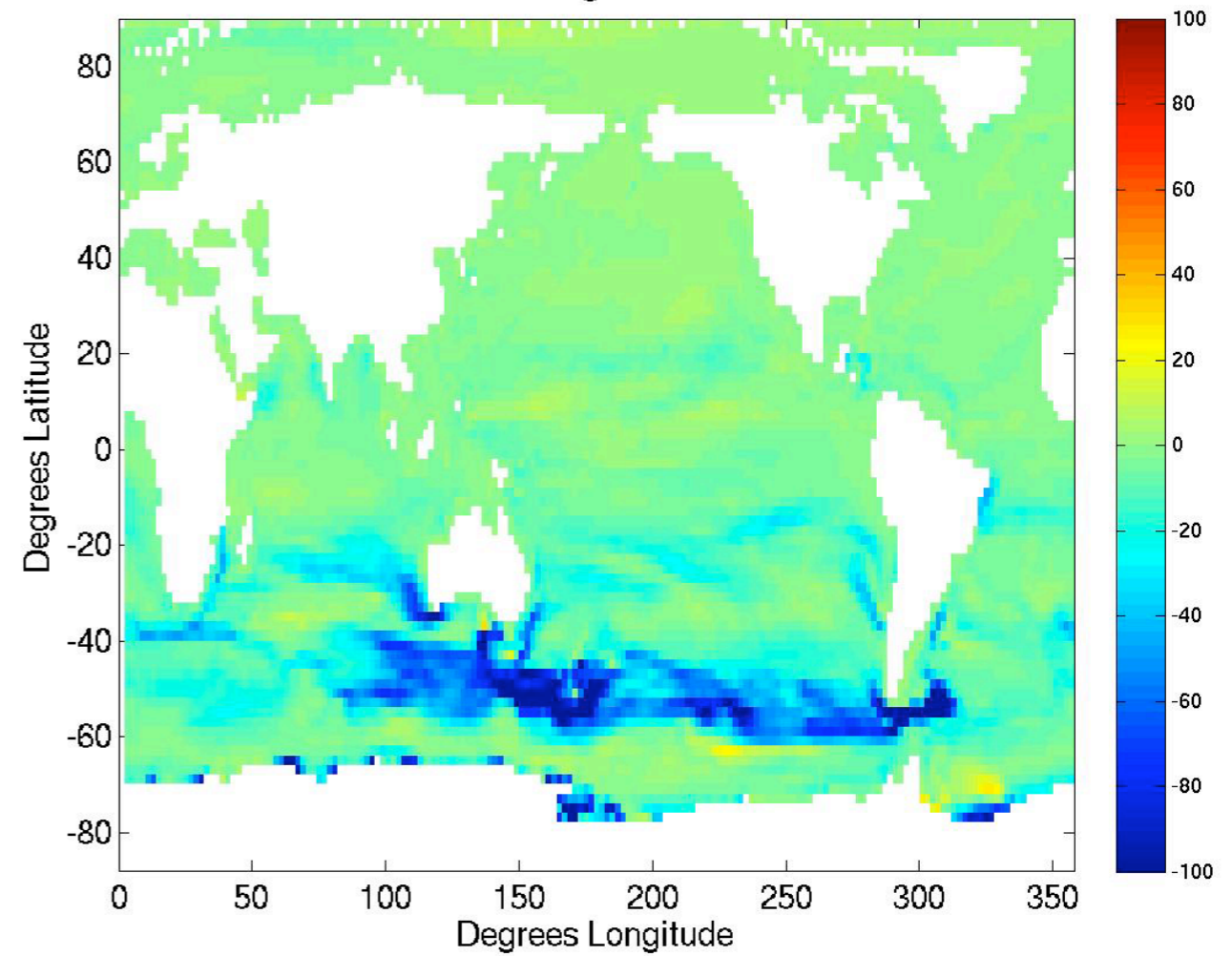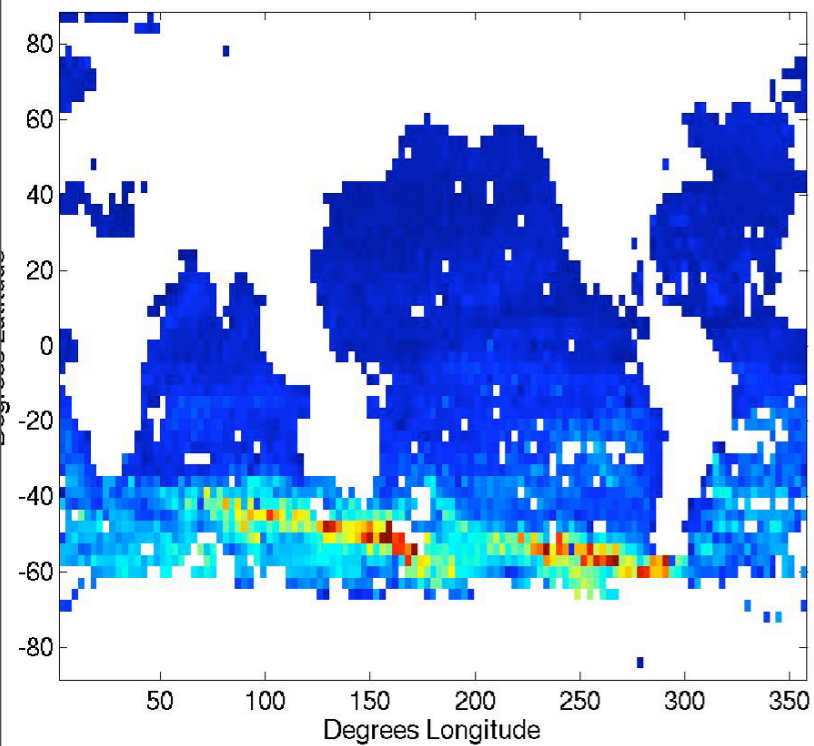de Boyer-Montegut et al. MLD AMJ

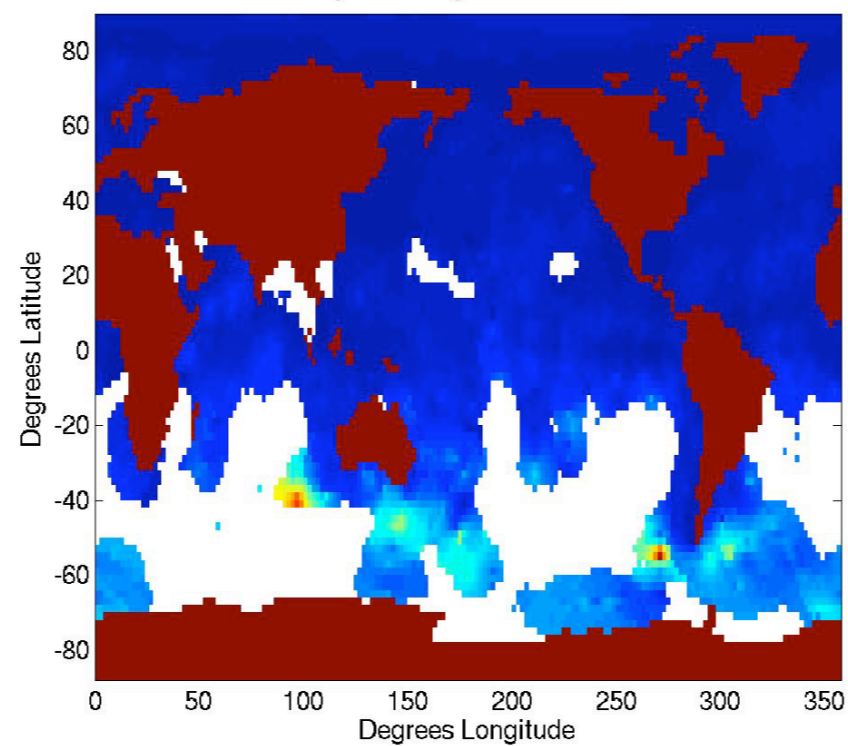Monterey and Levitus MLD AMJ
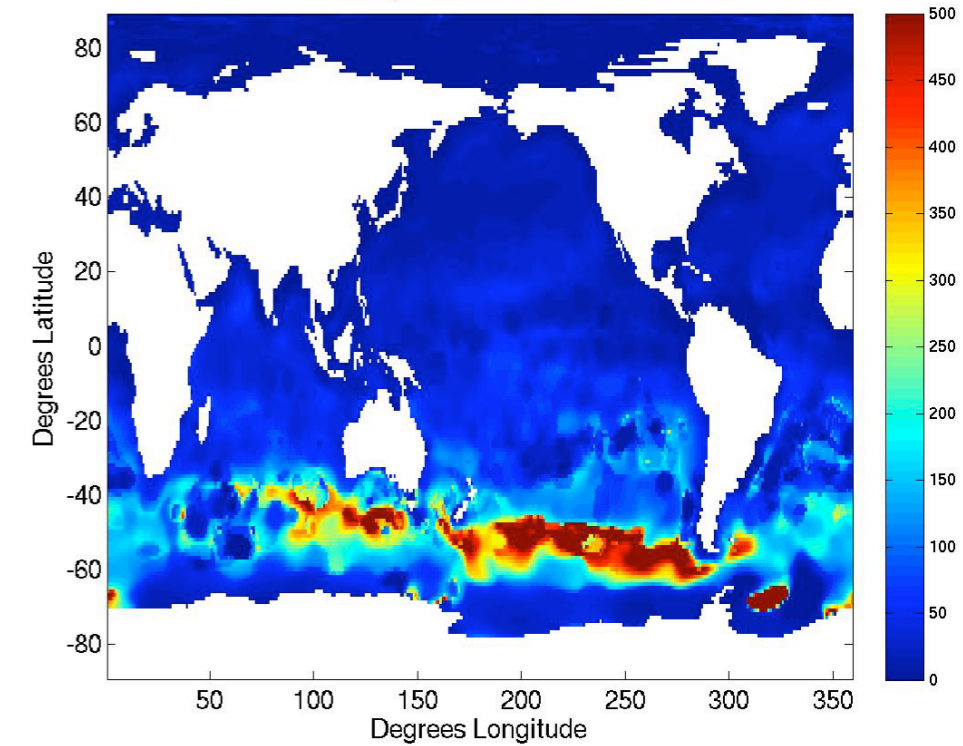
CCSM Control MLD JAS

CCSM MLD change due to MLE JAS
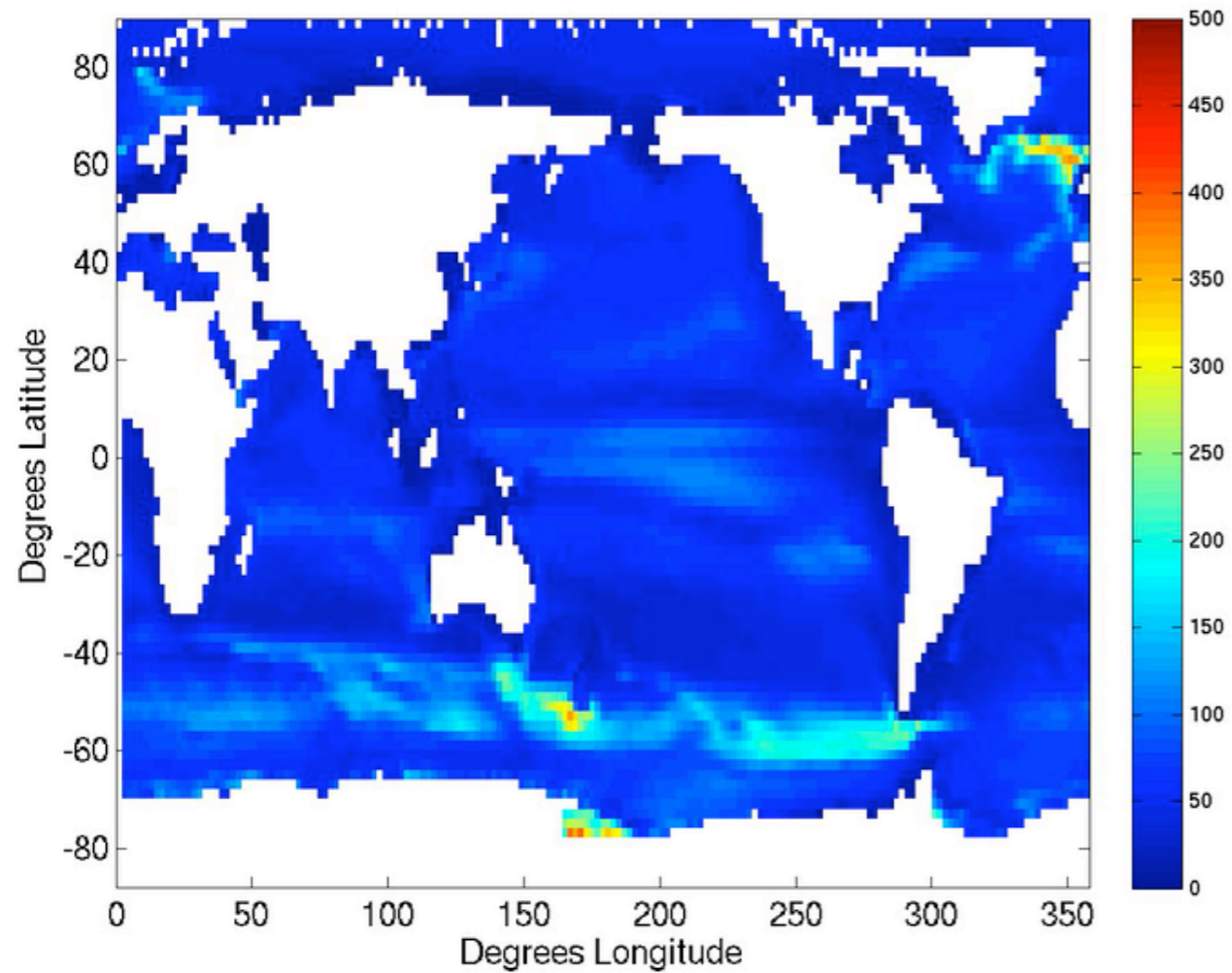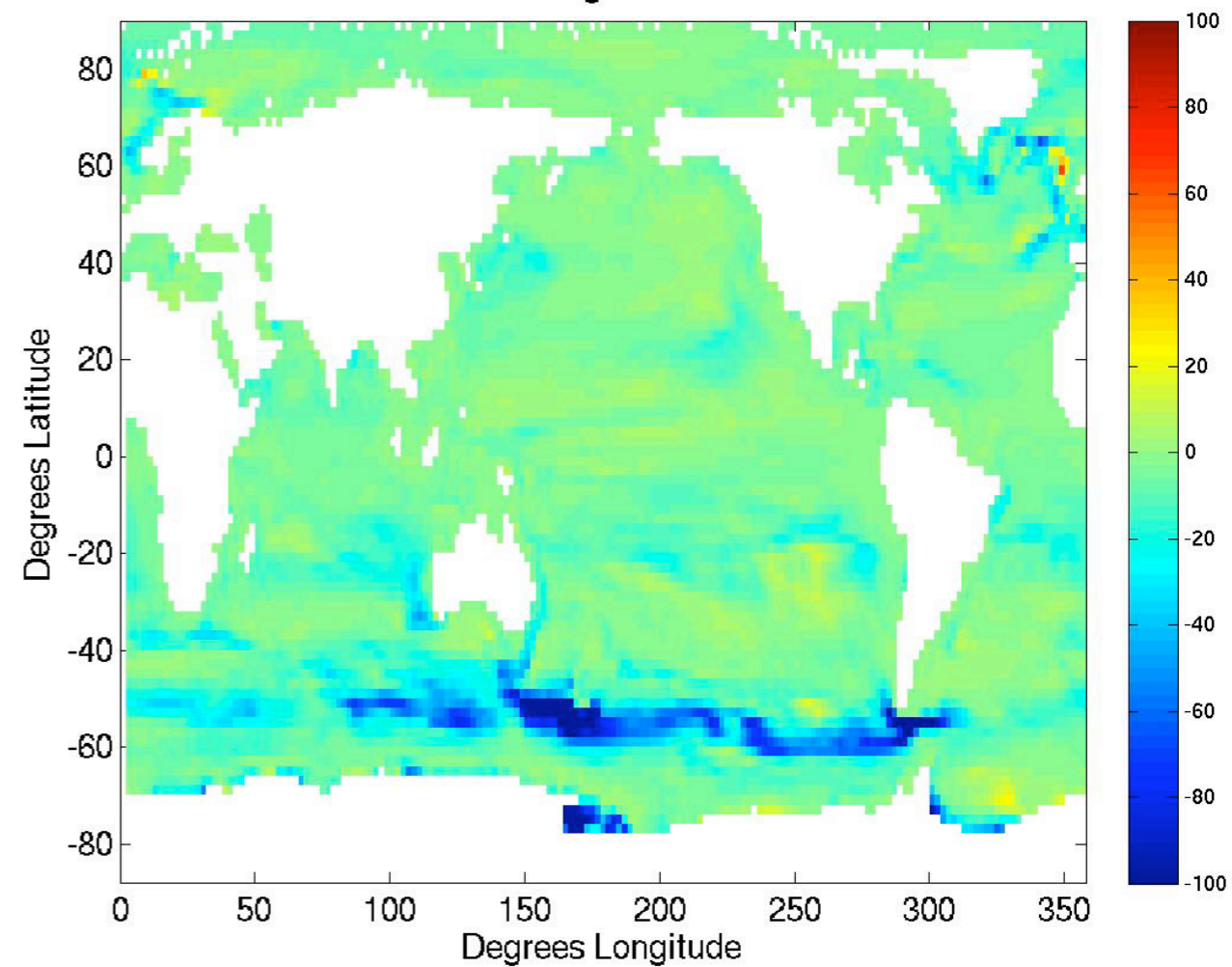
ARGO MLD JAS
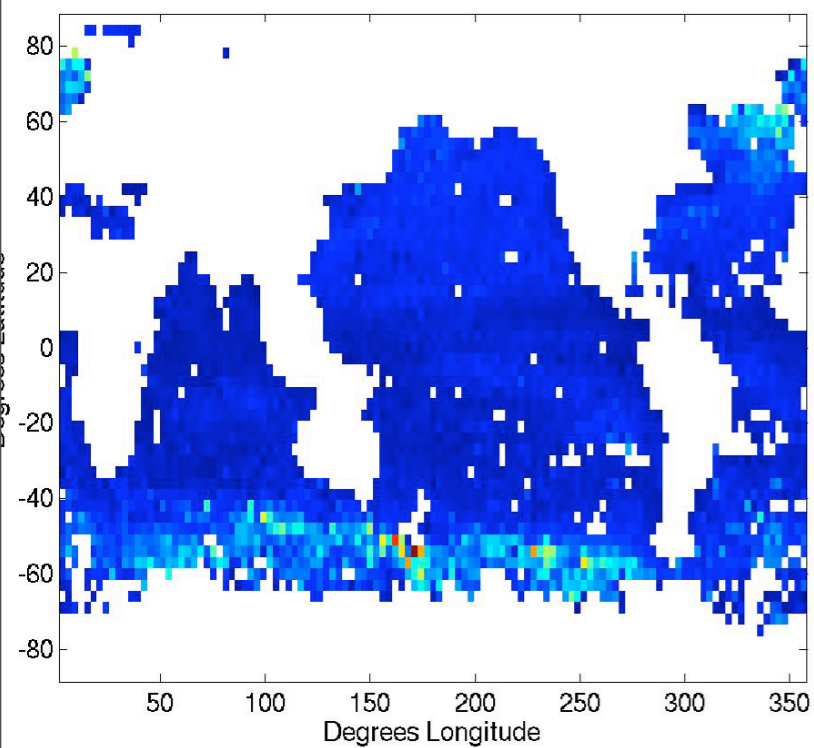
de Boyer-Montegut et al. MLD JAS

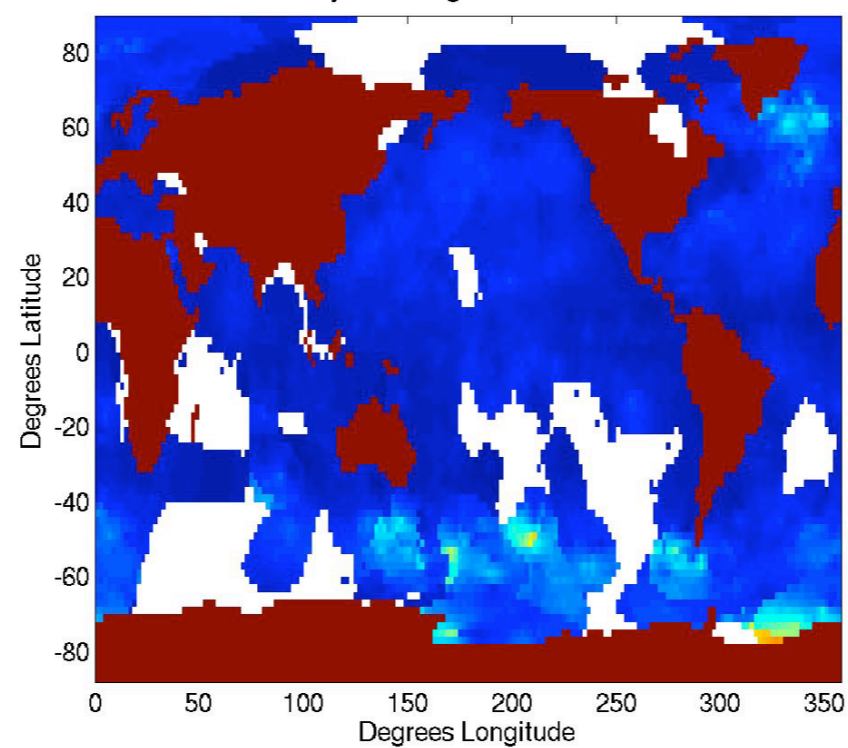Monterey and Levitus MLD JAS
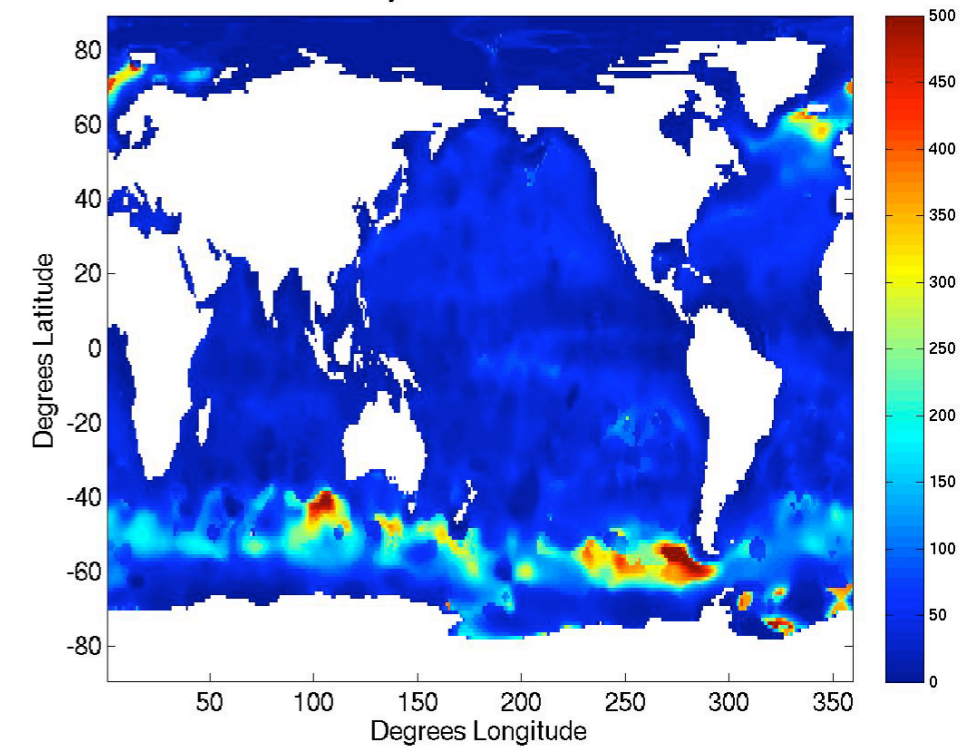
CCSM Control MLD OND
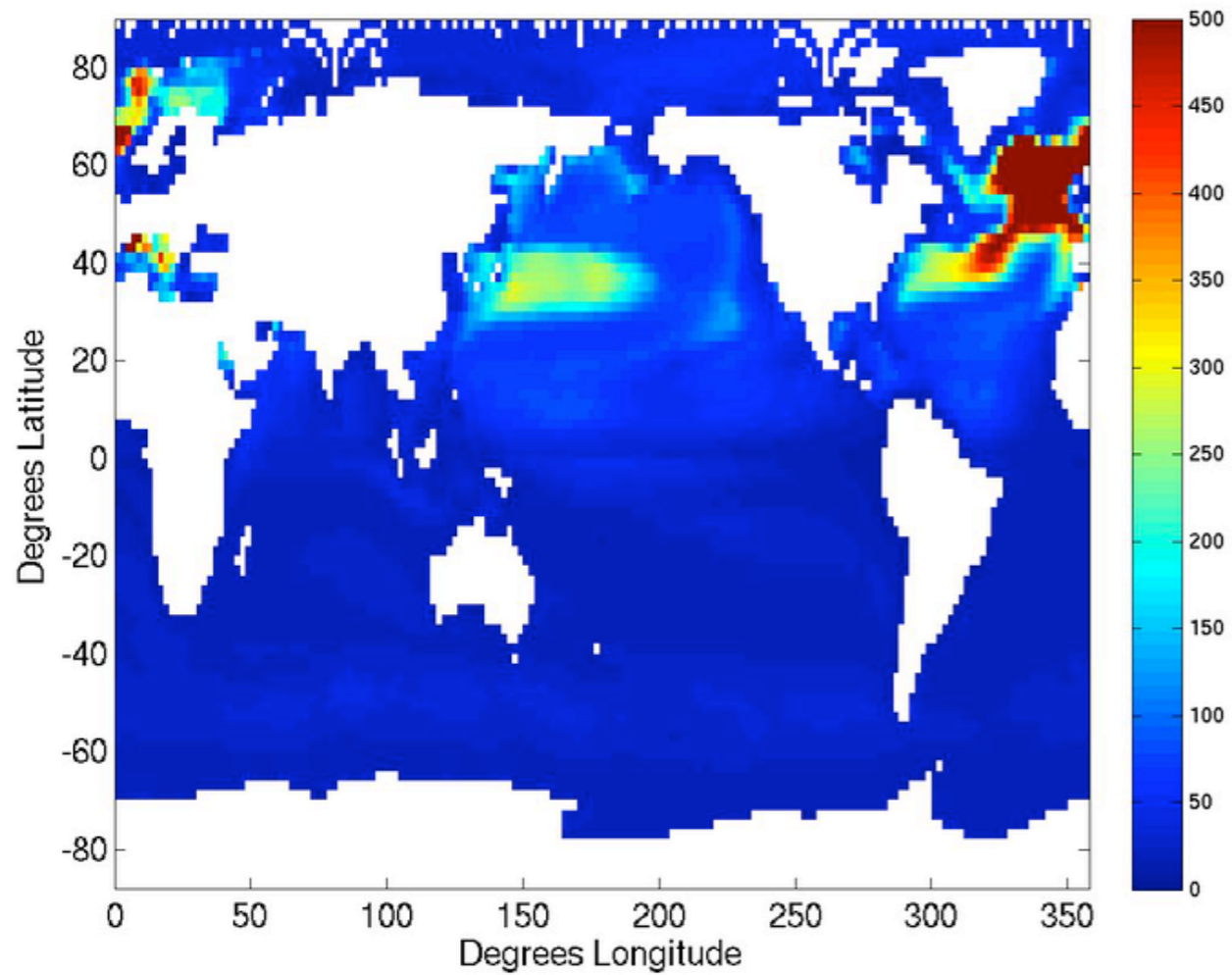
CCSM MLD change due to MLE OND
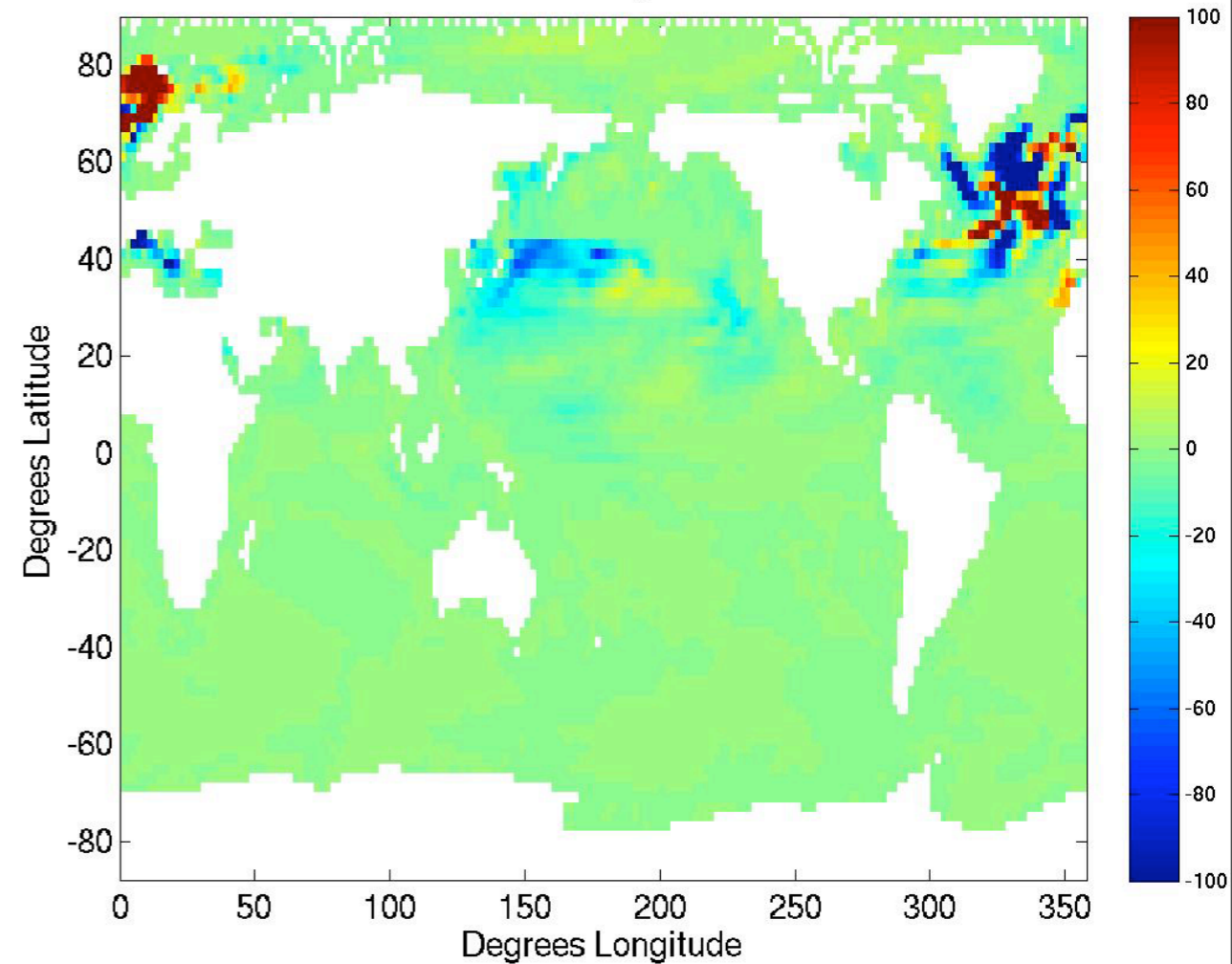
ARGO MLD OND

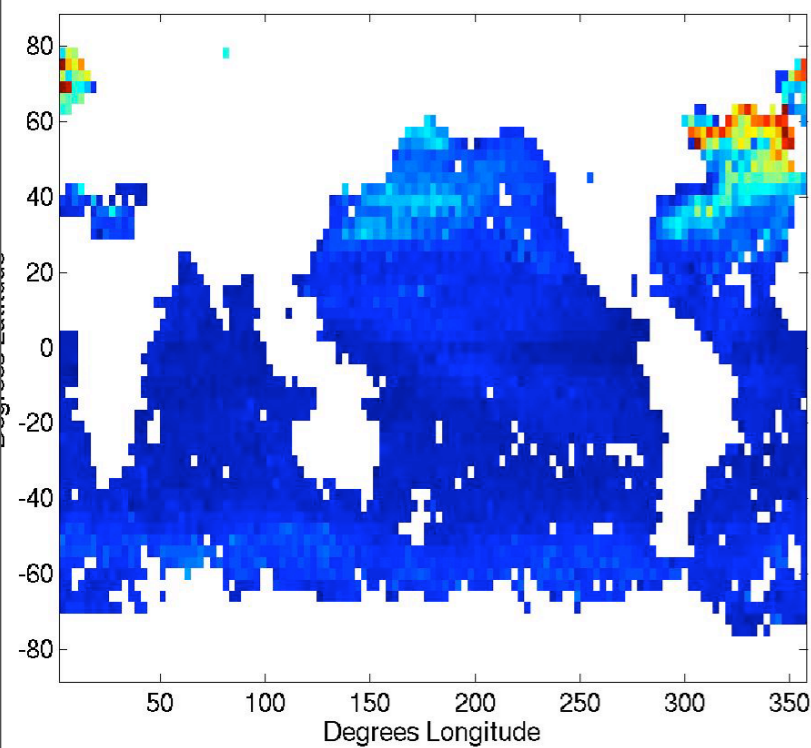de Boyer-Montegut et al. MLD OND

Monterey and Levitus MLD OND
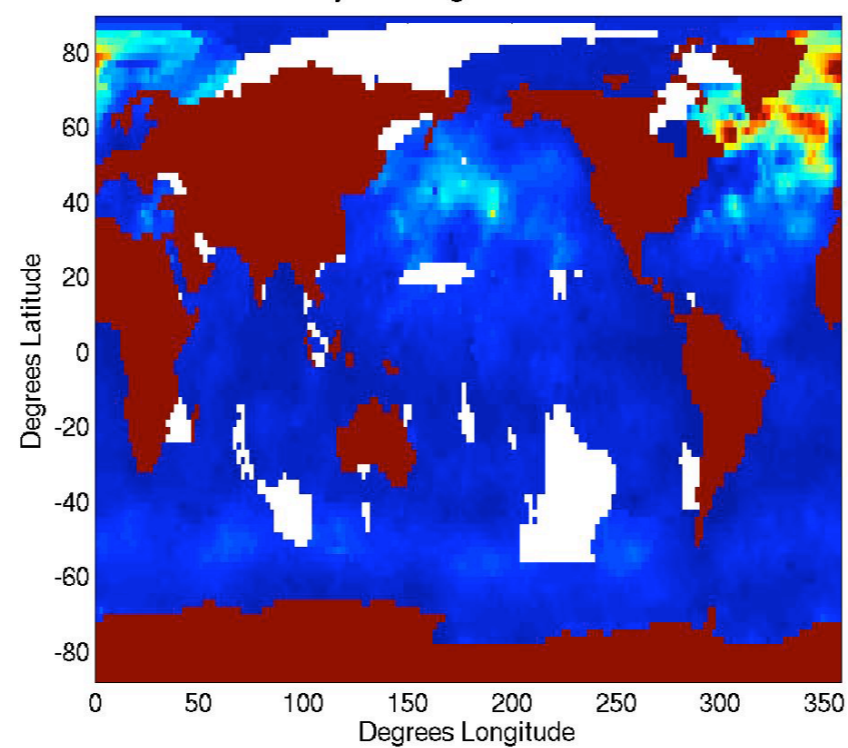
MOM/CM2.2 Control MLD JFM
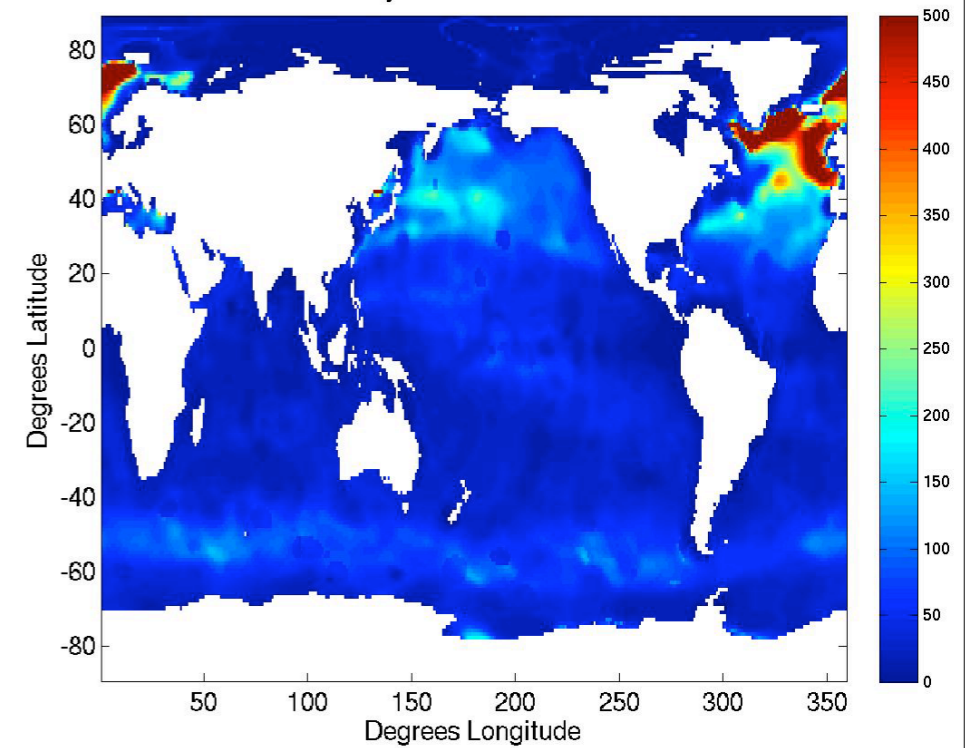
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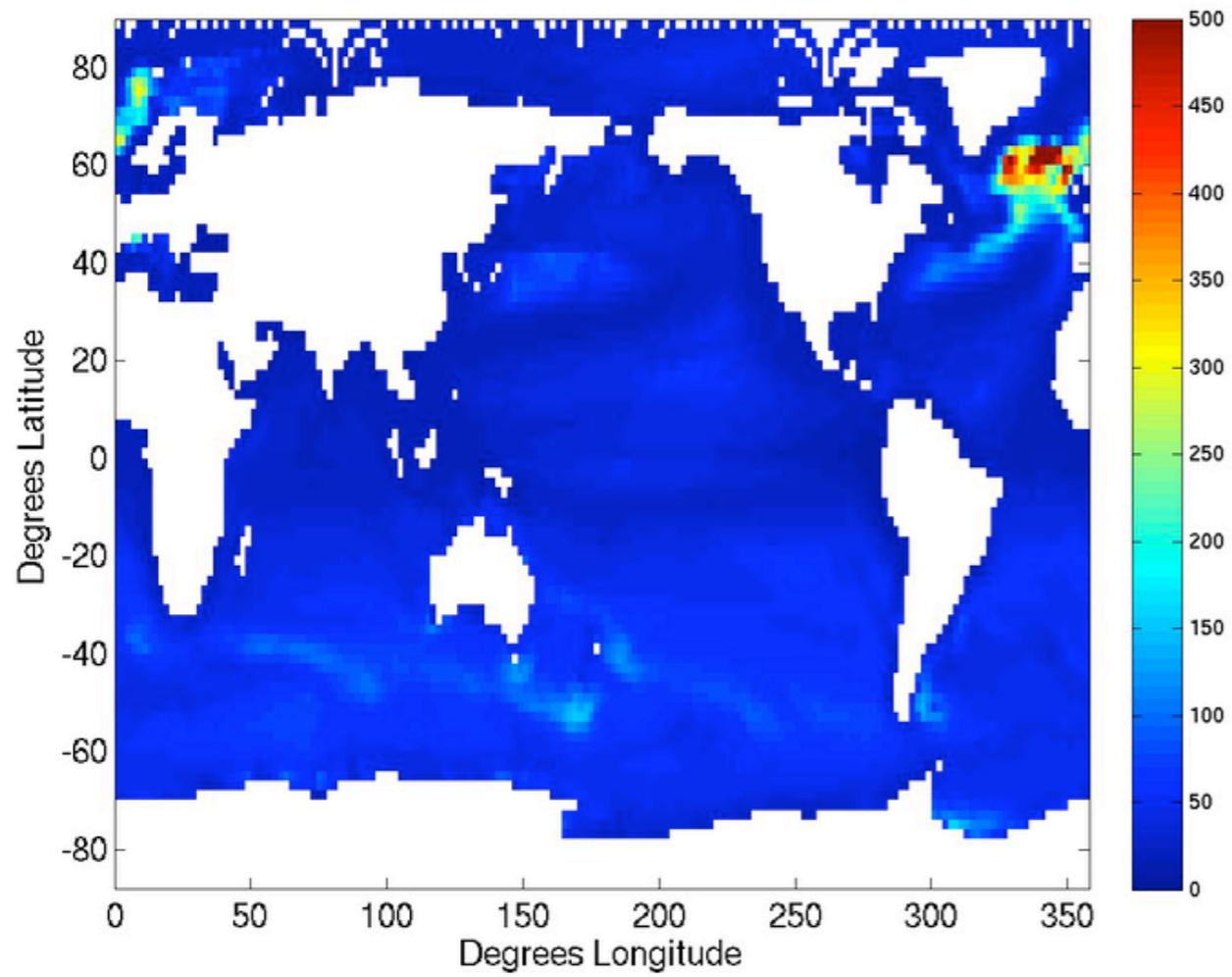
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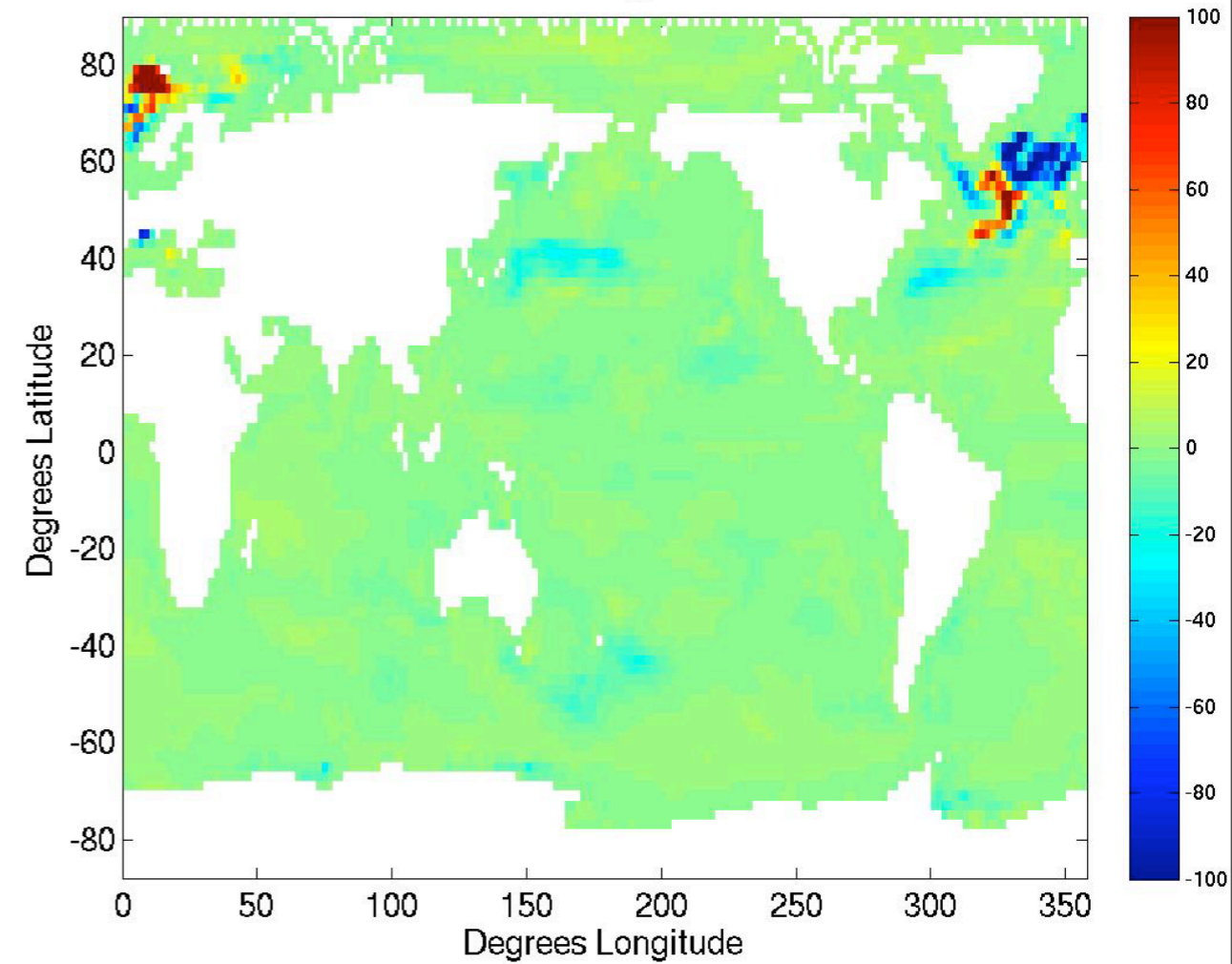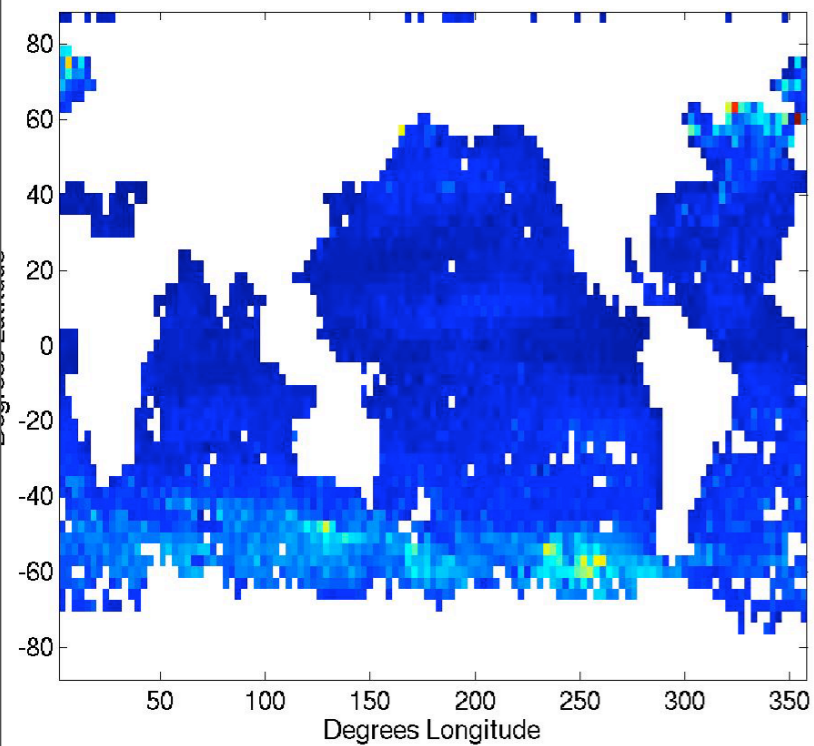de Boyer-Montegut et al. MLD JFM

Monterey and Levitus MLD JFM
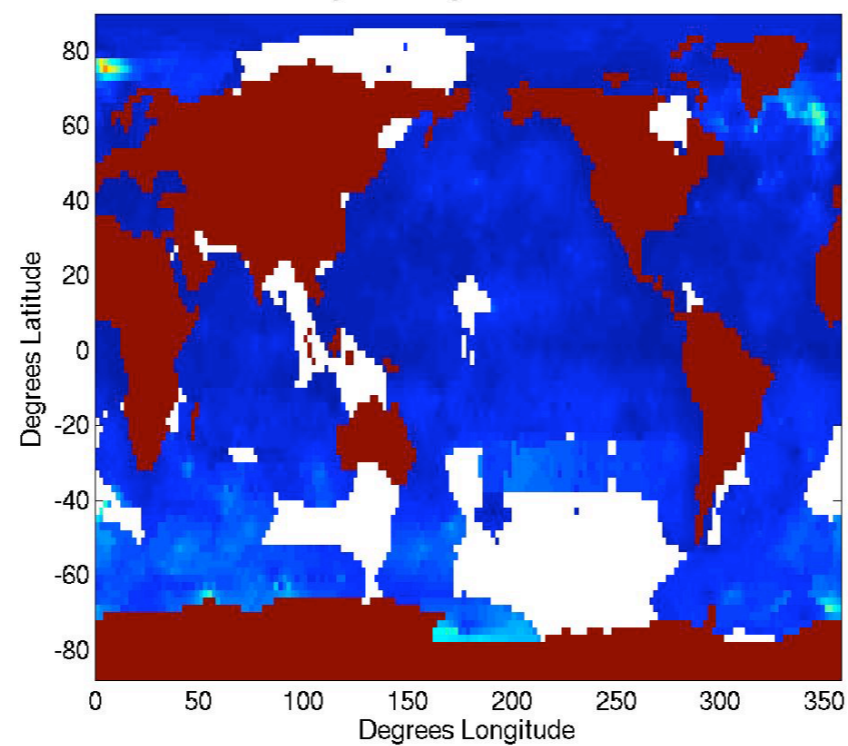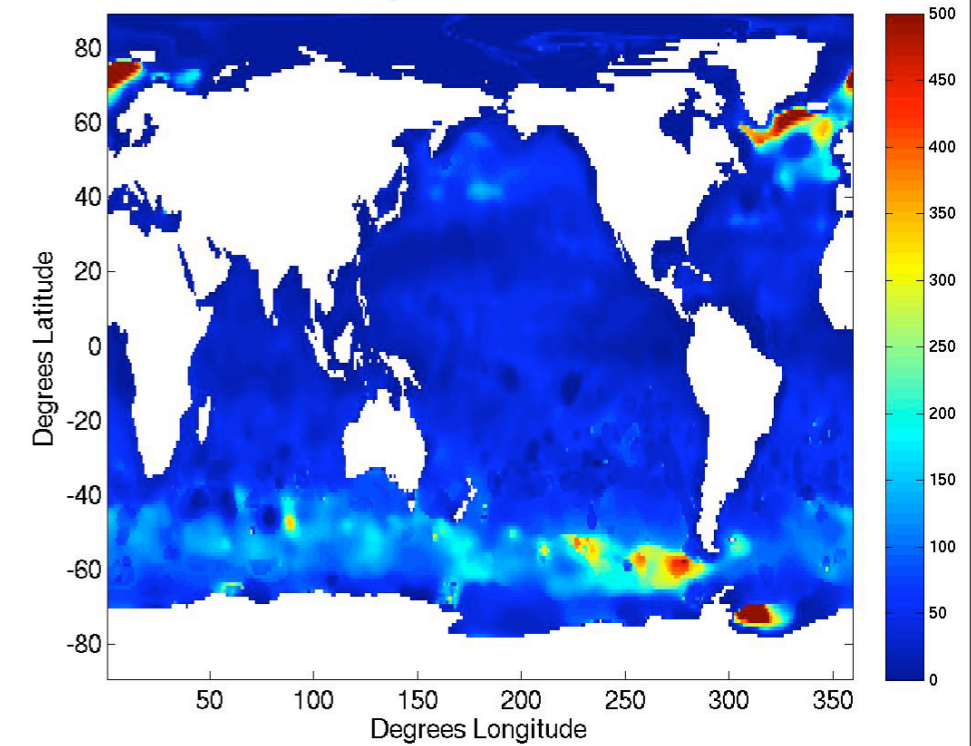
MOM/CM2.2 Control MLD AMJ
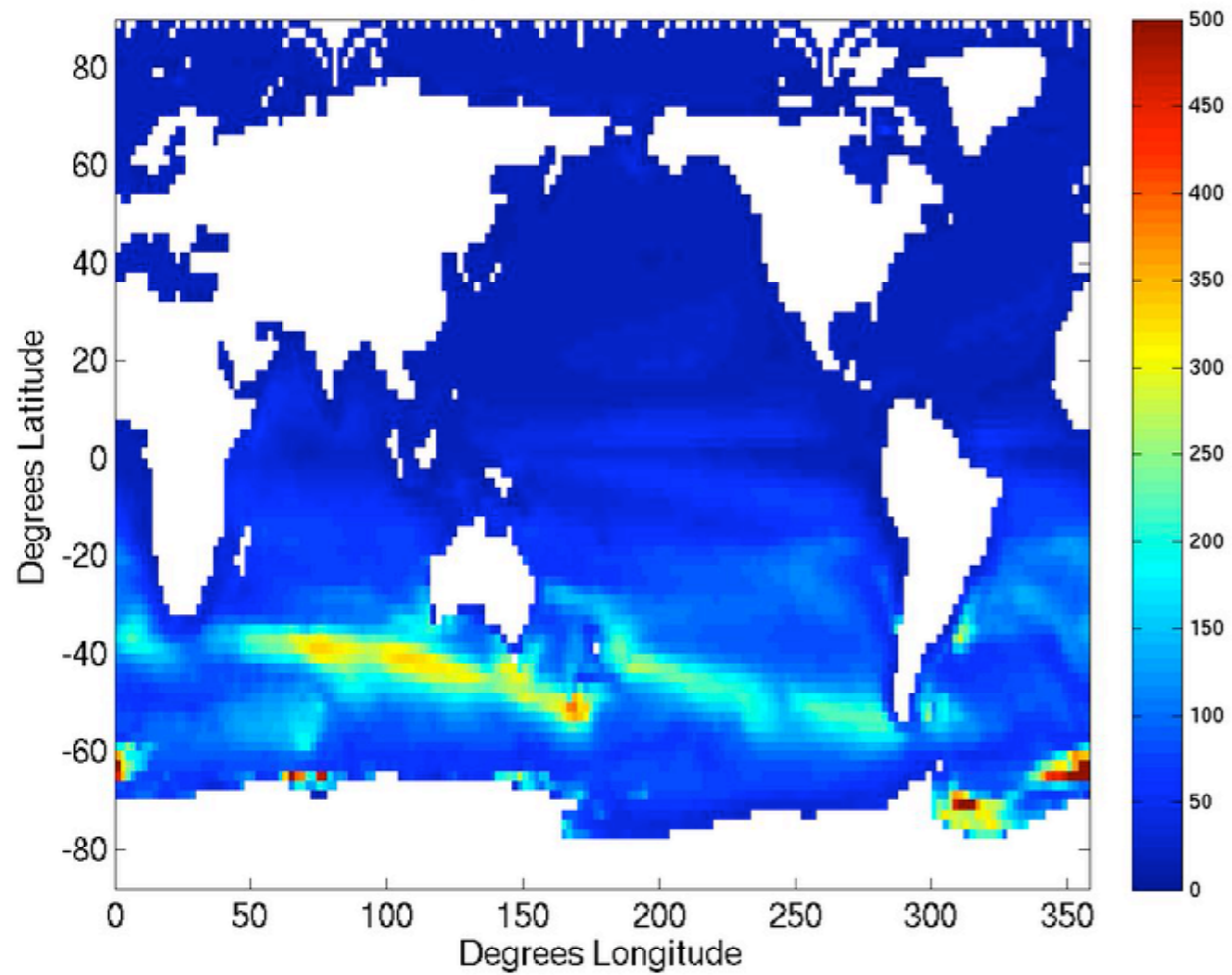
MOM/CM2.2 MLD change due to MLE AMJ

ARGO MLD AMJ
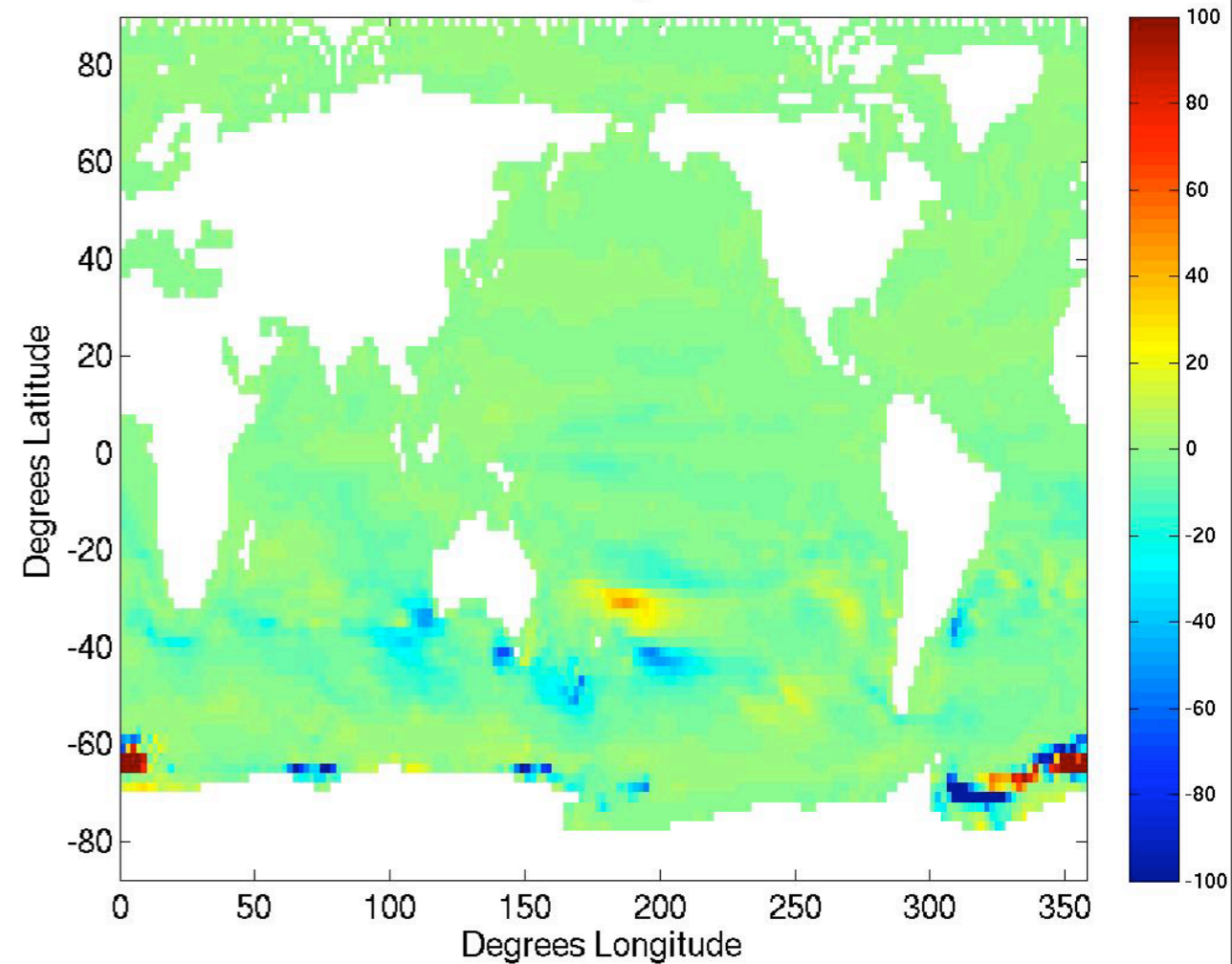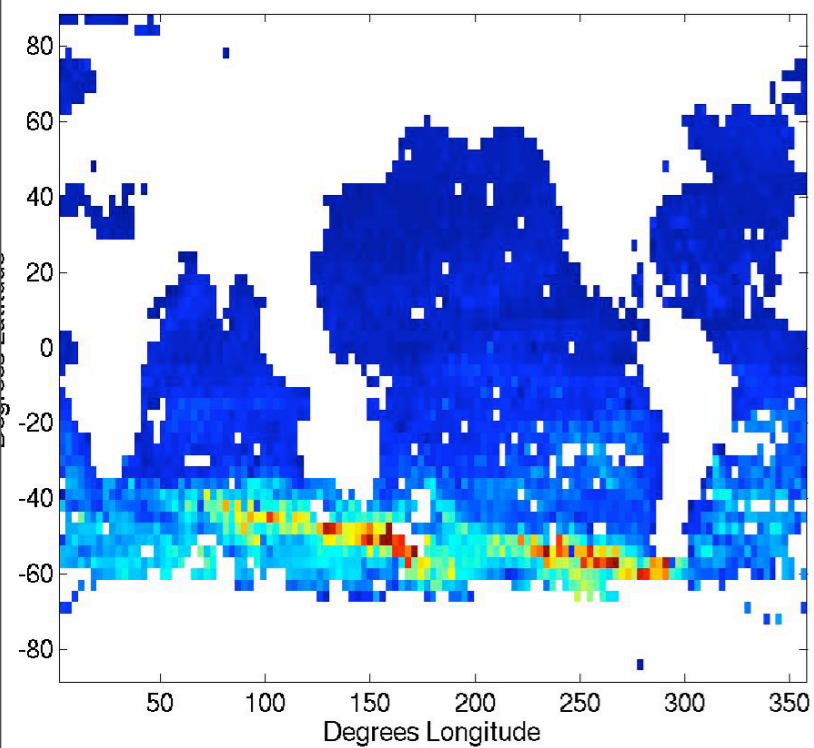
de Boyer-Montegut et al. MLD AMJ

Monterey and Levitus MLD AMJ
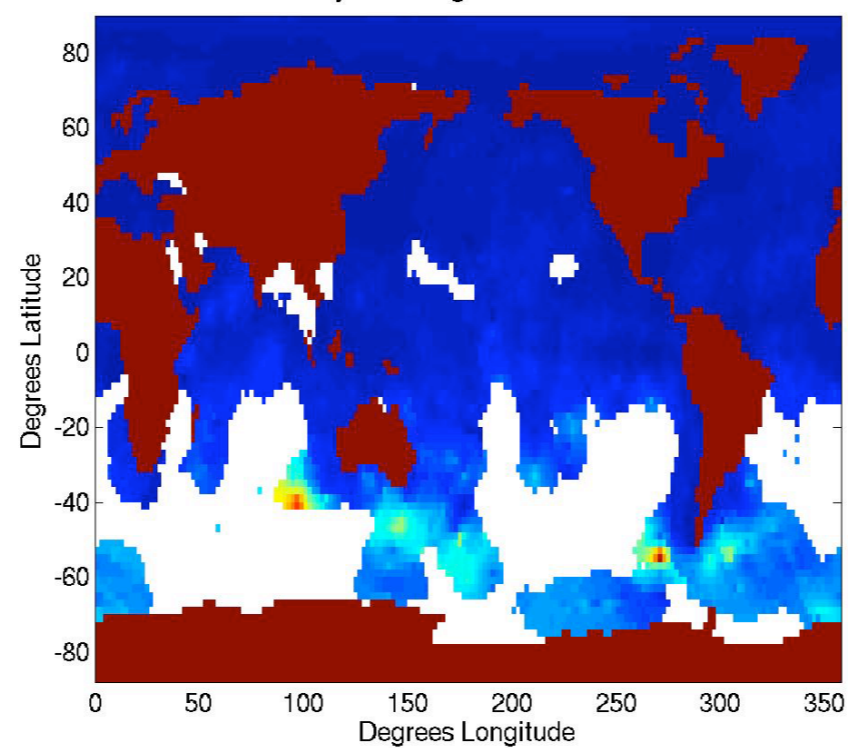
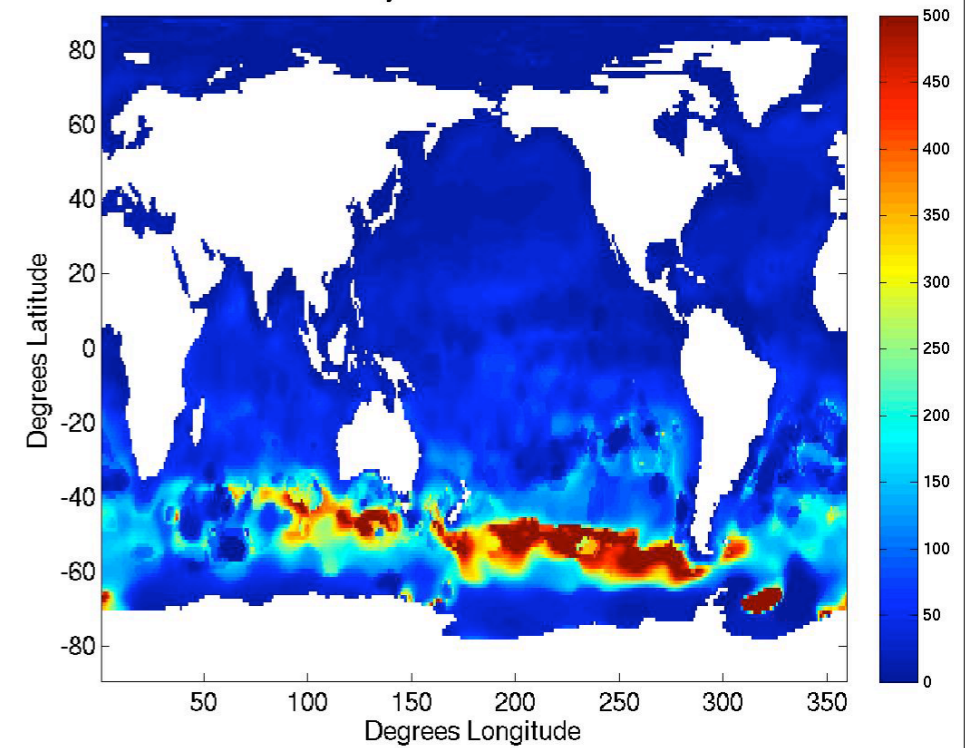MOM/CM2.2 Control MLD JAS

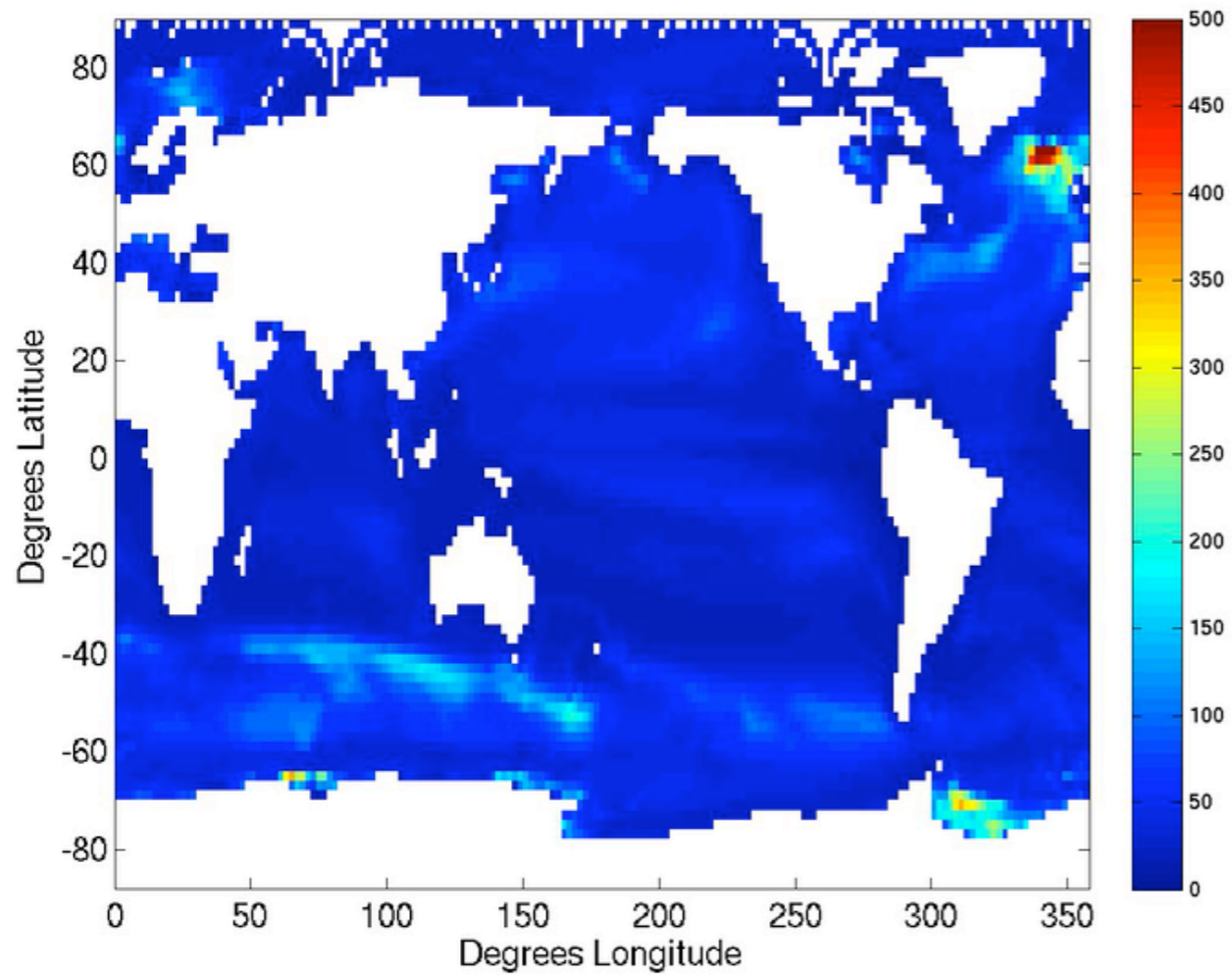MOM/CM2.2 MLD change due to MLE JAS

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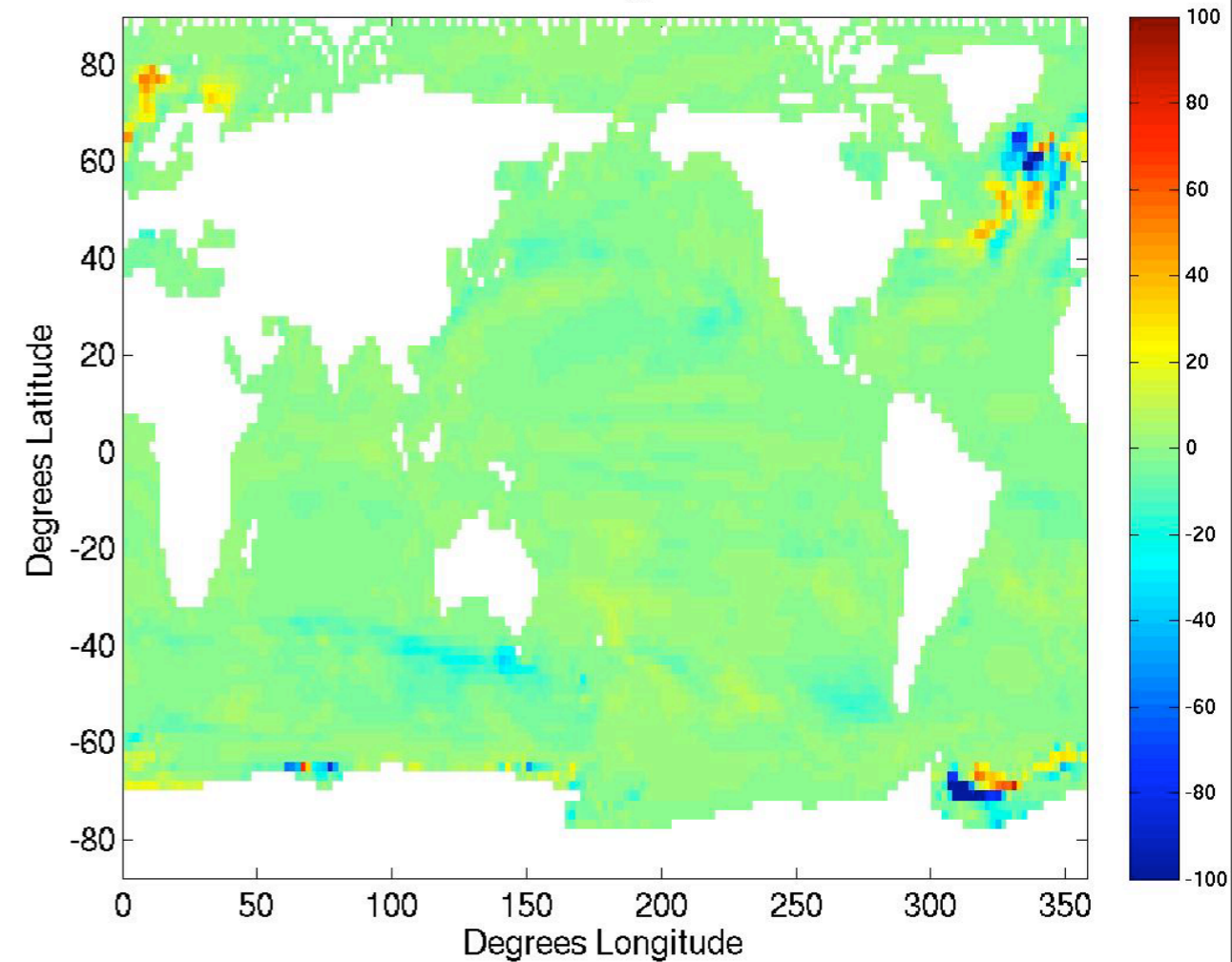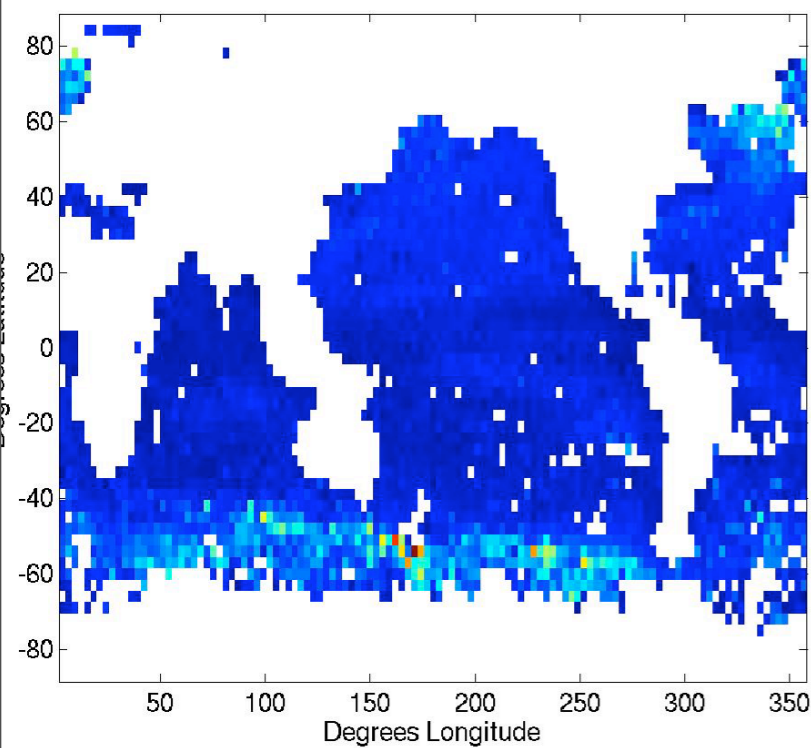
de Boyer-Montegut et al. MLD JAS

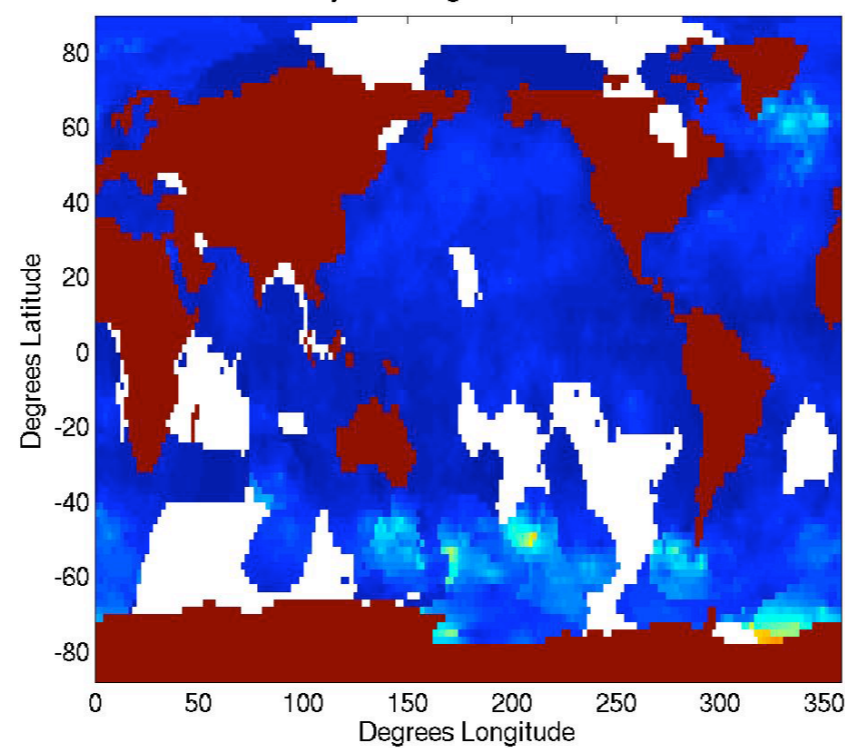Monterey and Levitus MLD JAS

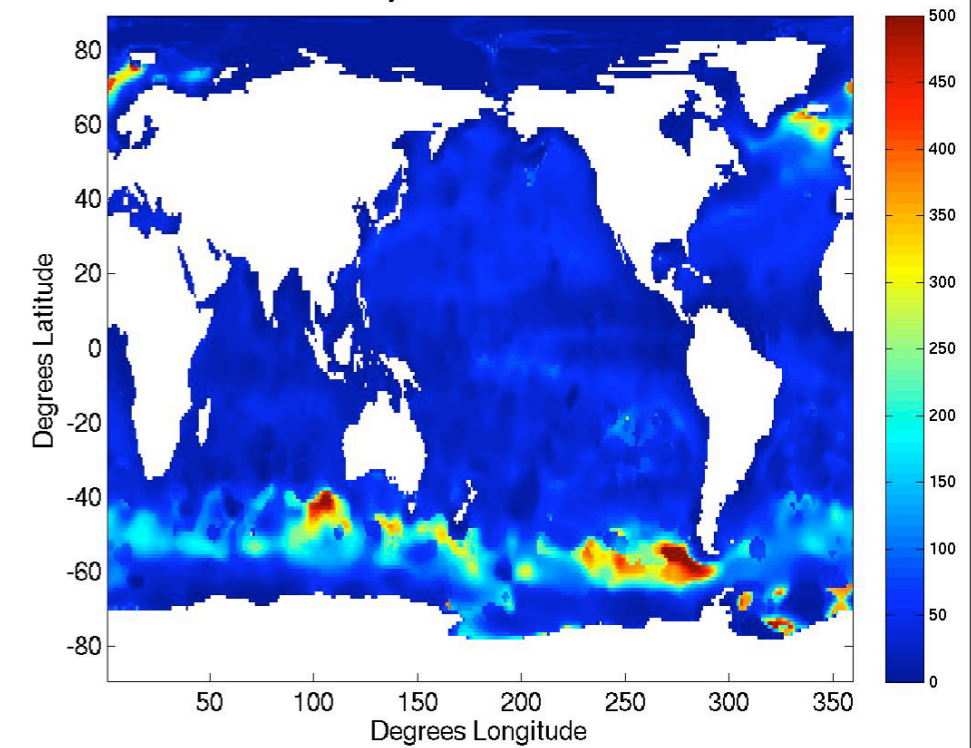MOM/CM2.2 Control MLD OND

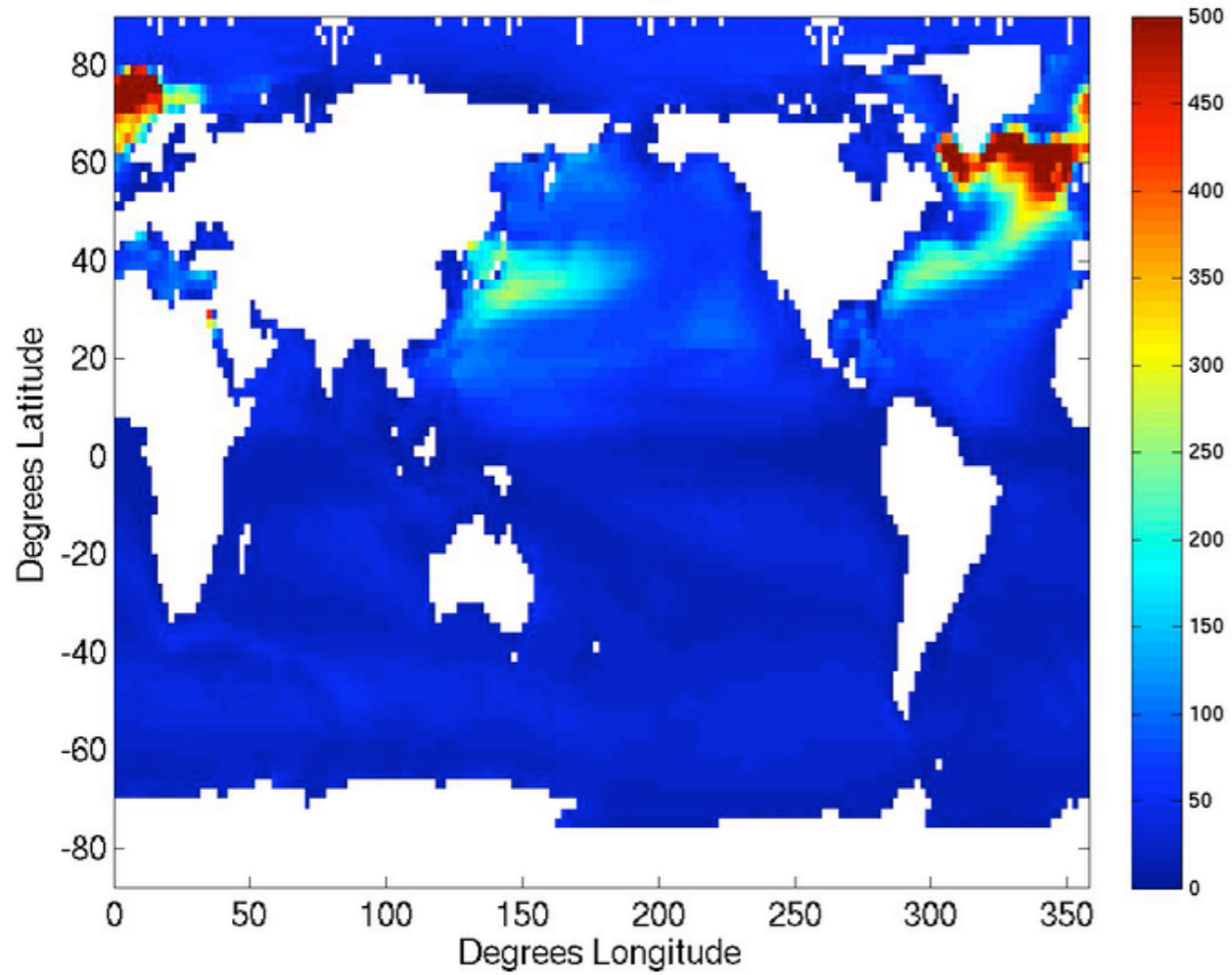MOM/CM2.2 MLD change due to MLE OND

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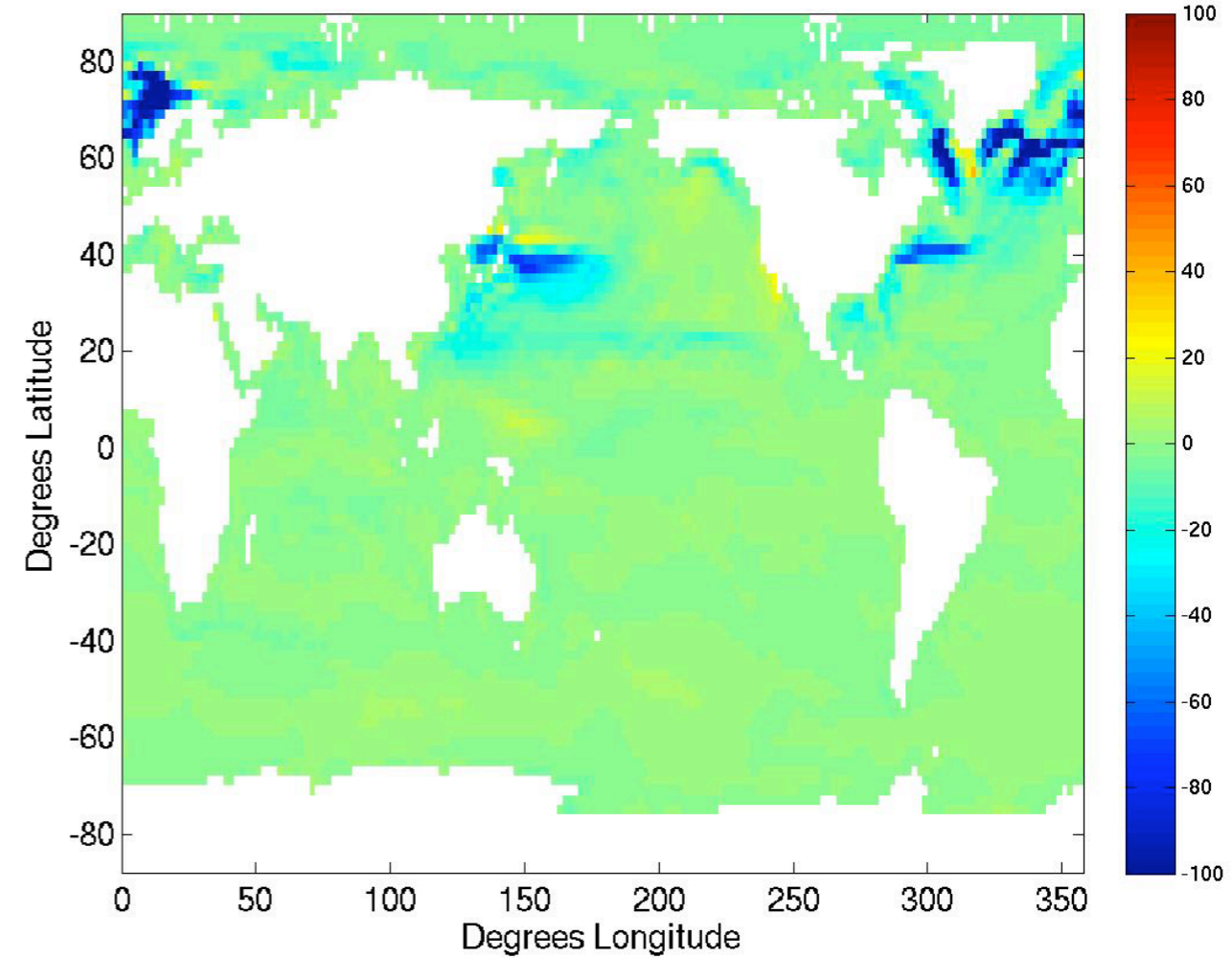
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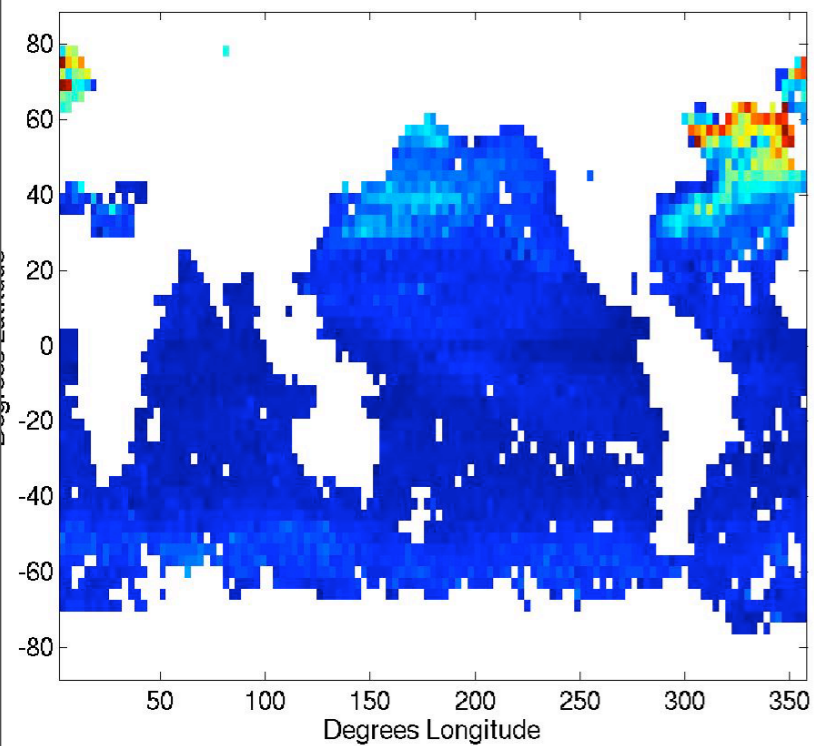
Monterey and Levitus MLD OND
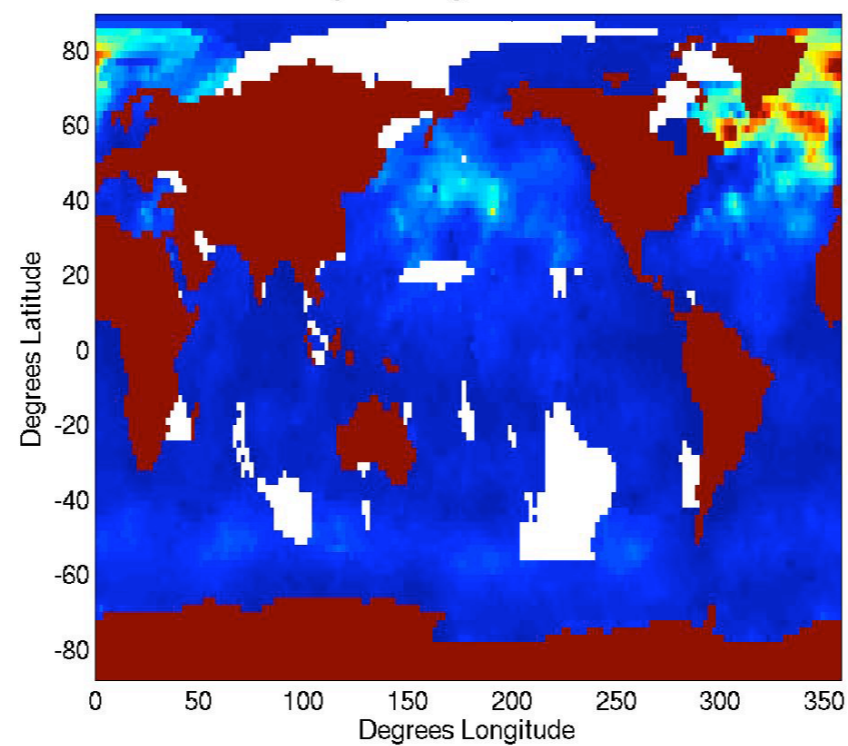
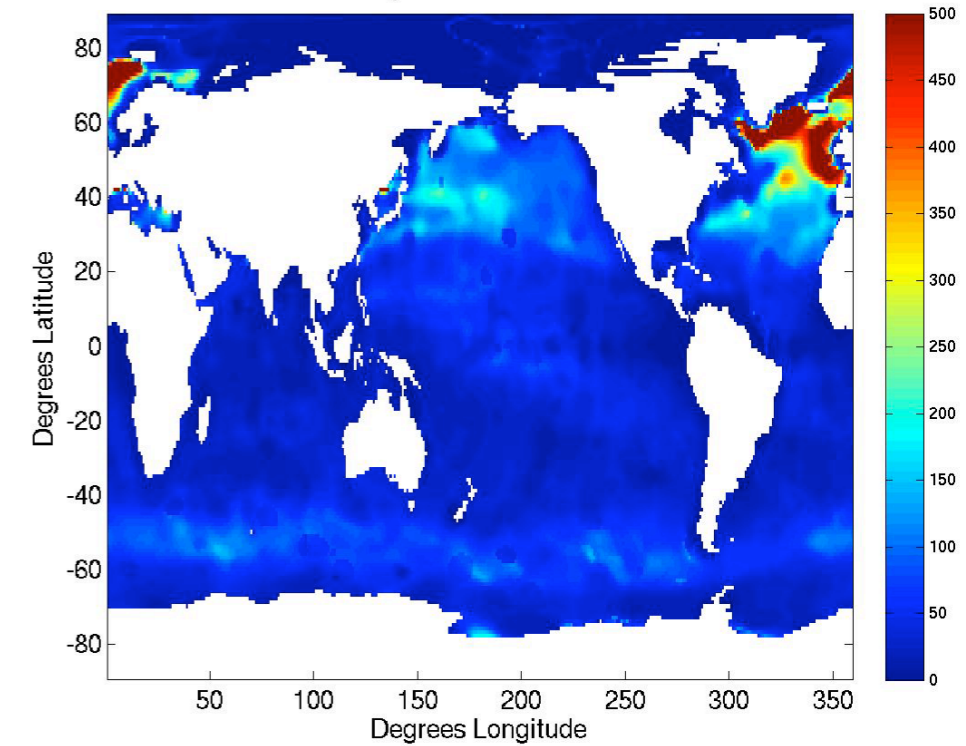GOLD/CM2.2 with MLE param. BLT JFM

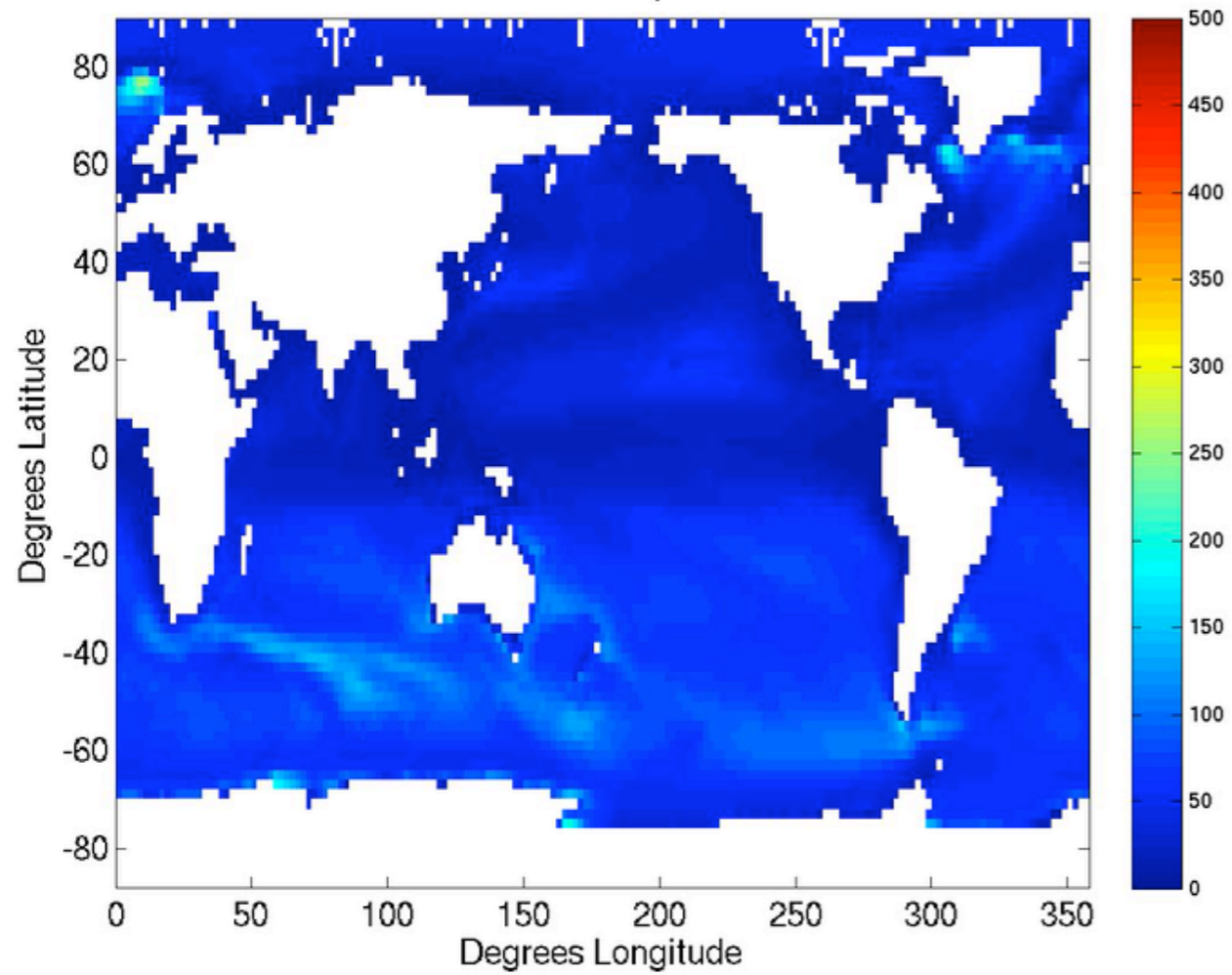GOLD/CM2.2 MLD change due to MLE JFM

ARGO MLD JFM
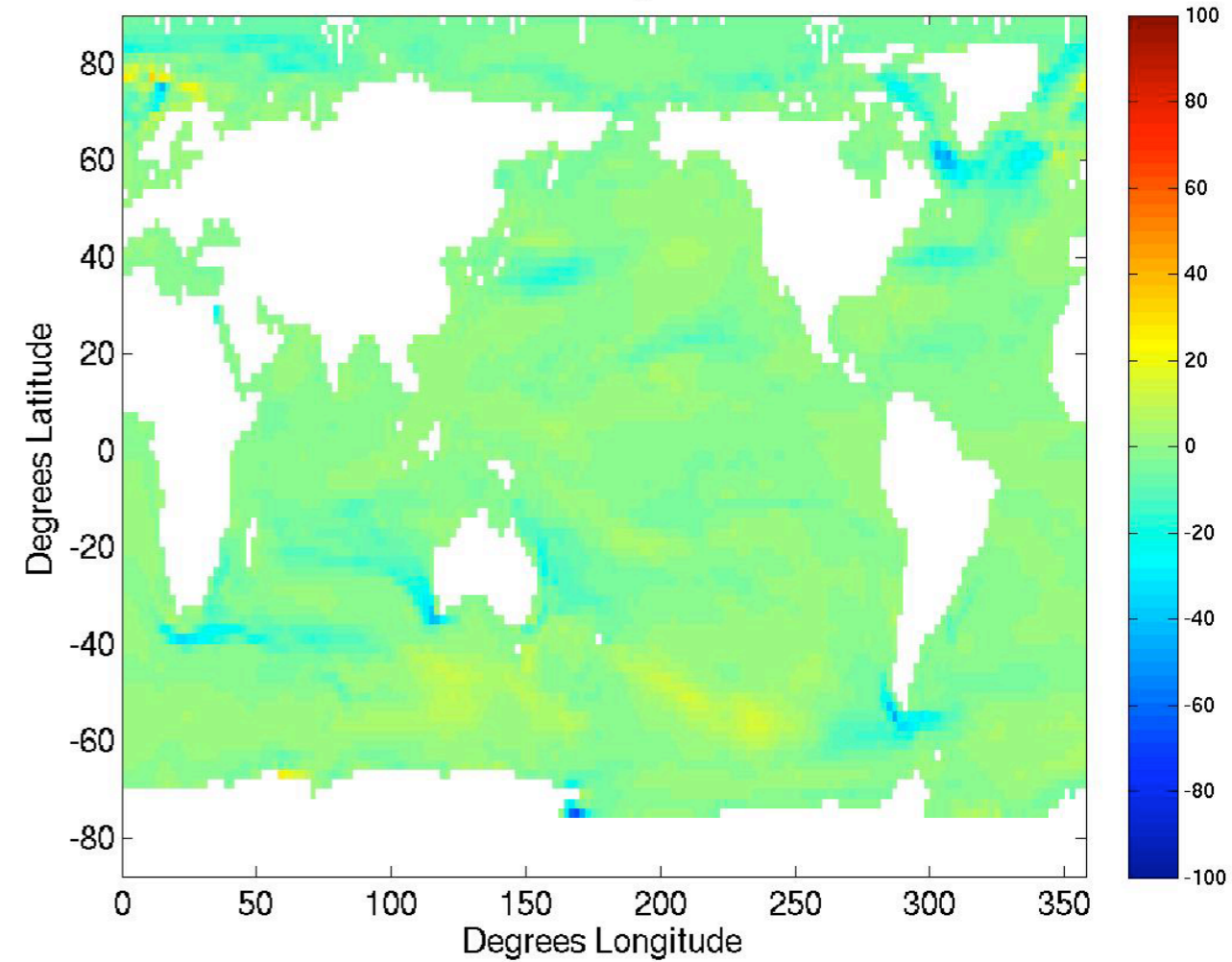
de Boyer-Montegut et al. MLD JFM
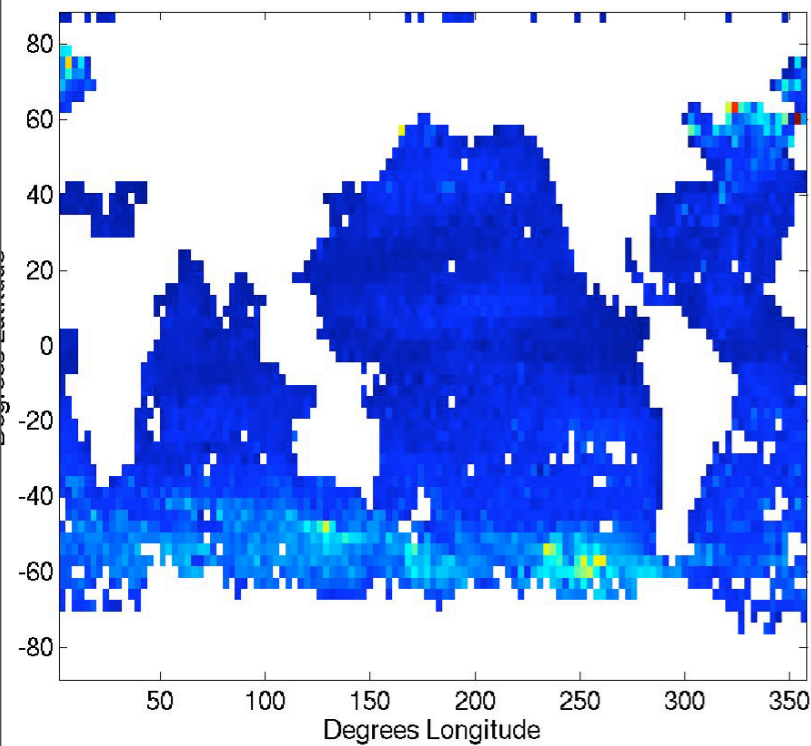
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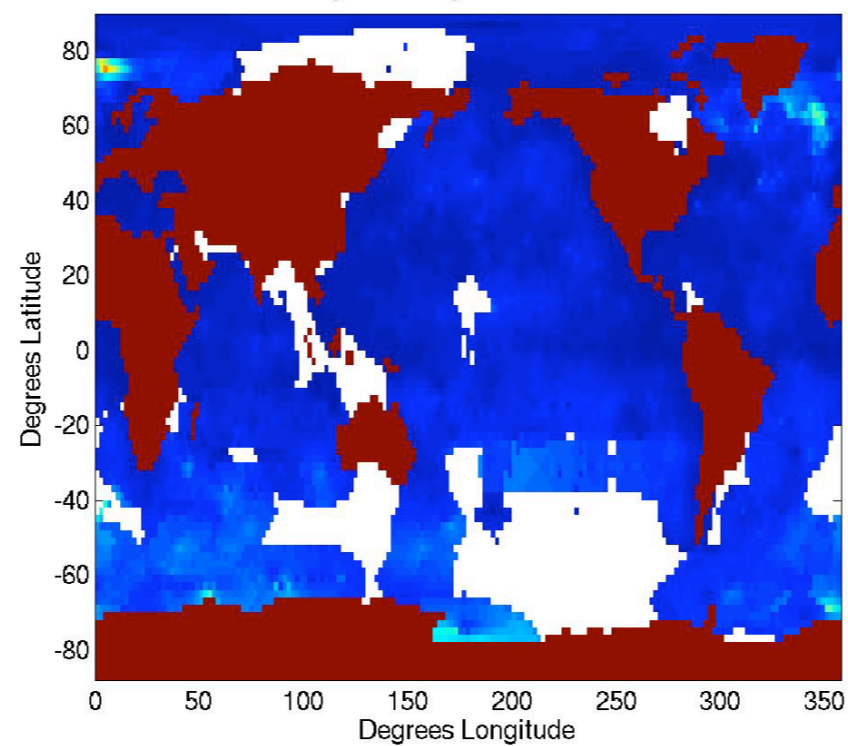
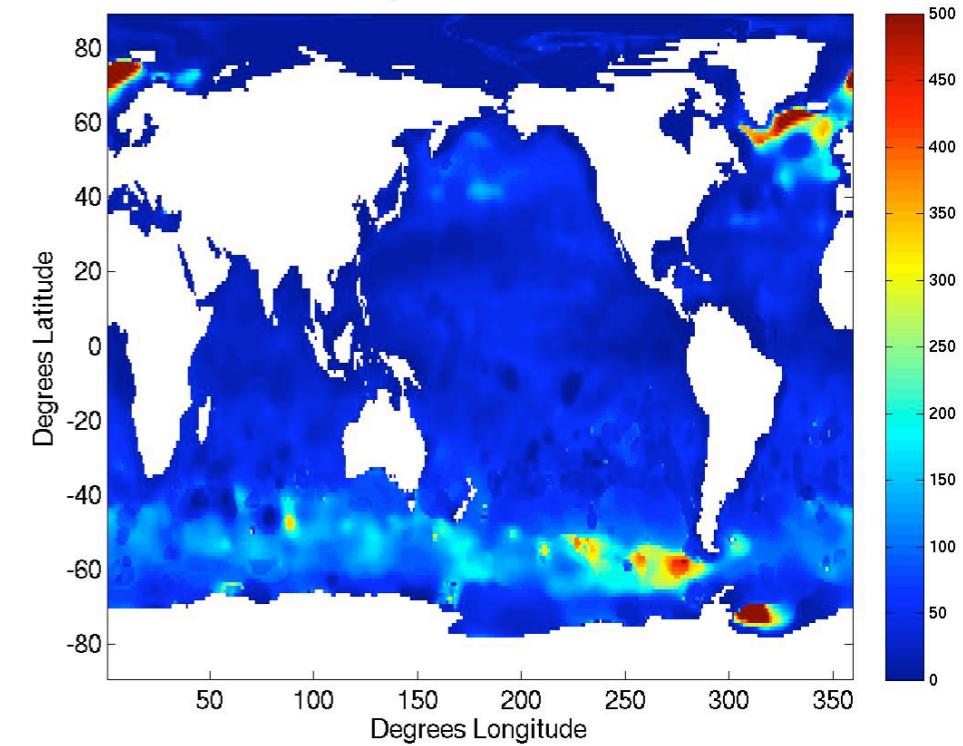GOLD/CM2.2 with MLE param. BLT AMJ

GOLD/CM2.2 MLD change due to MLE AMJ
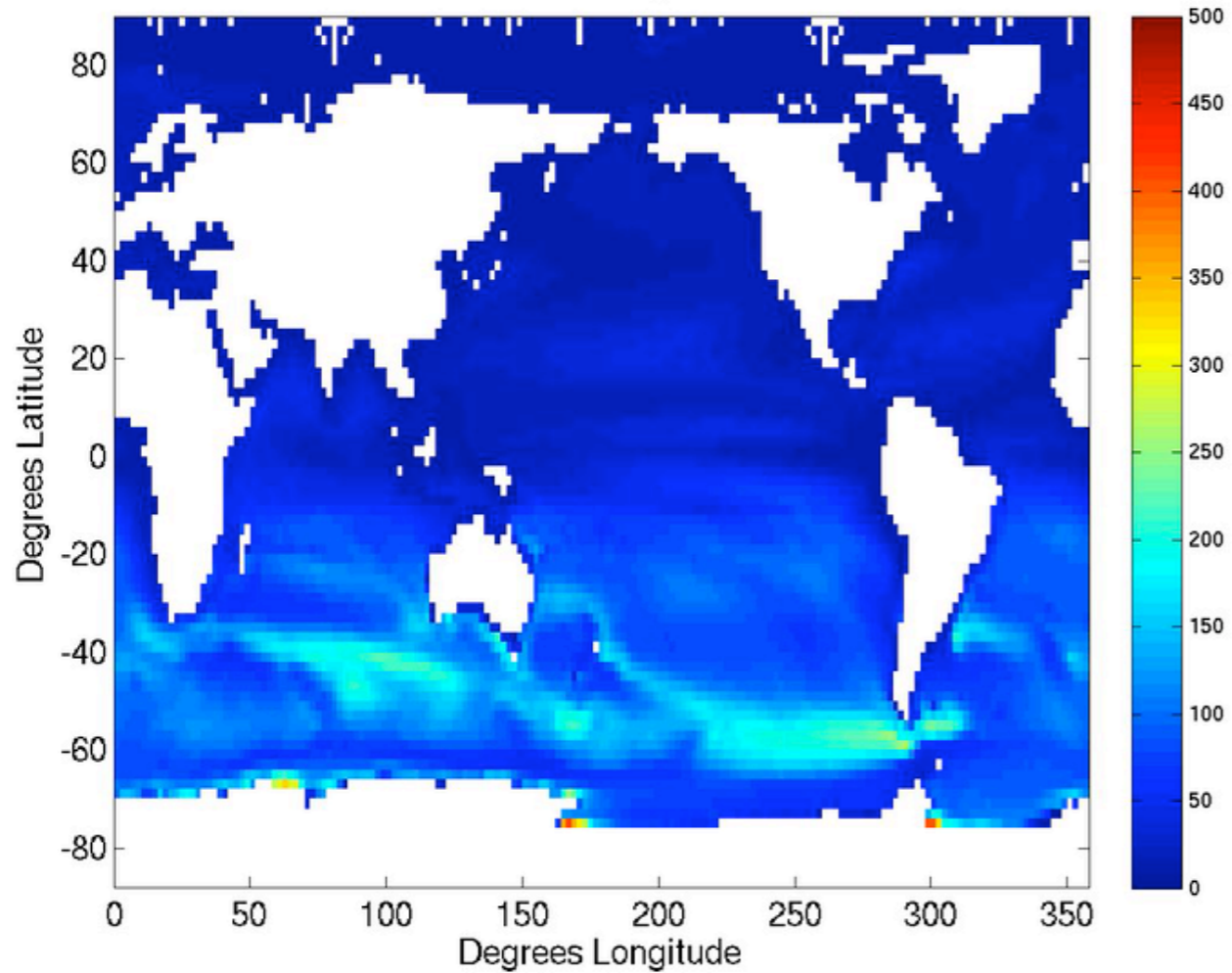
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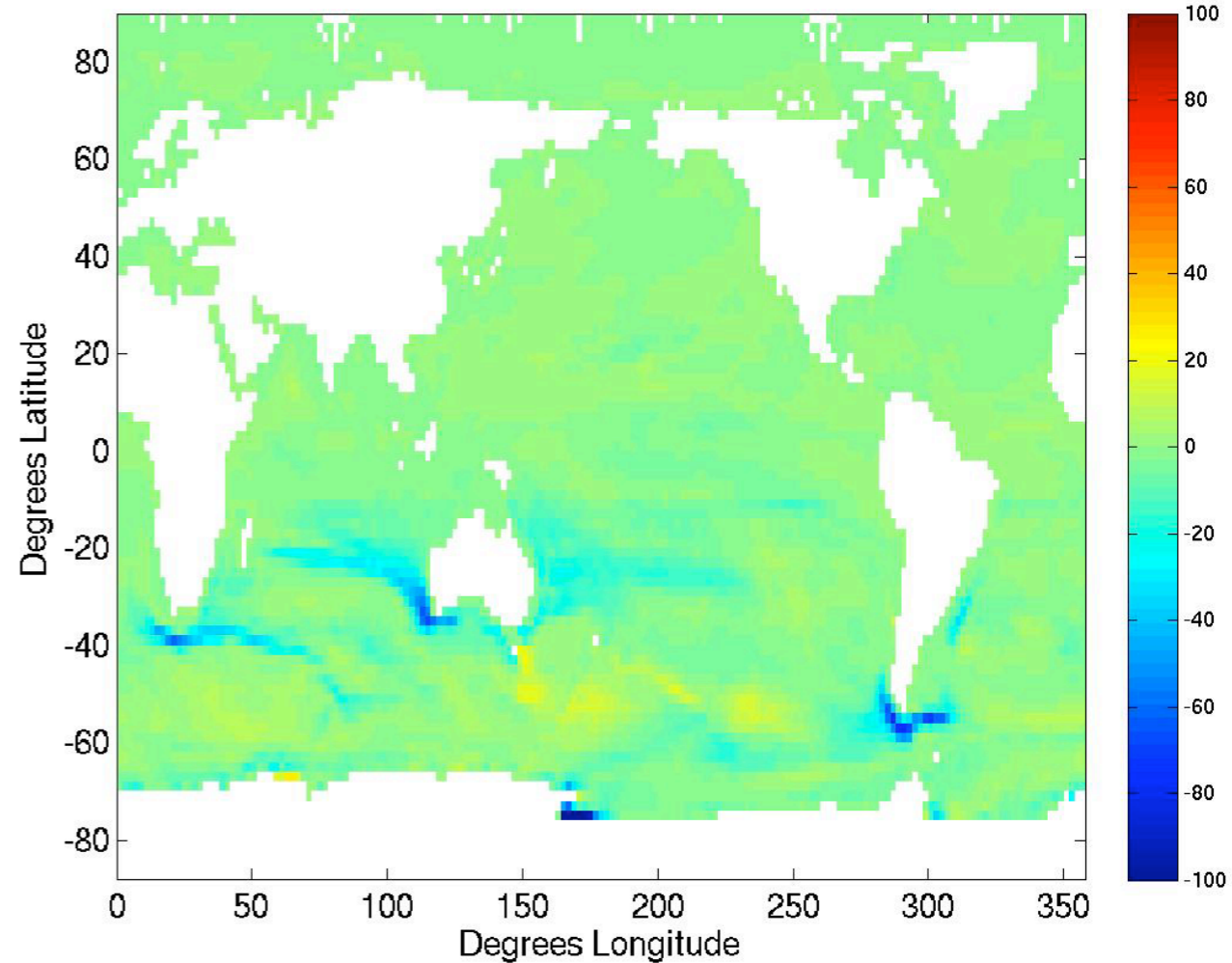
de Boyer-Montegut et al. MLD AMJ
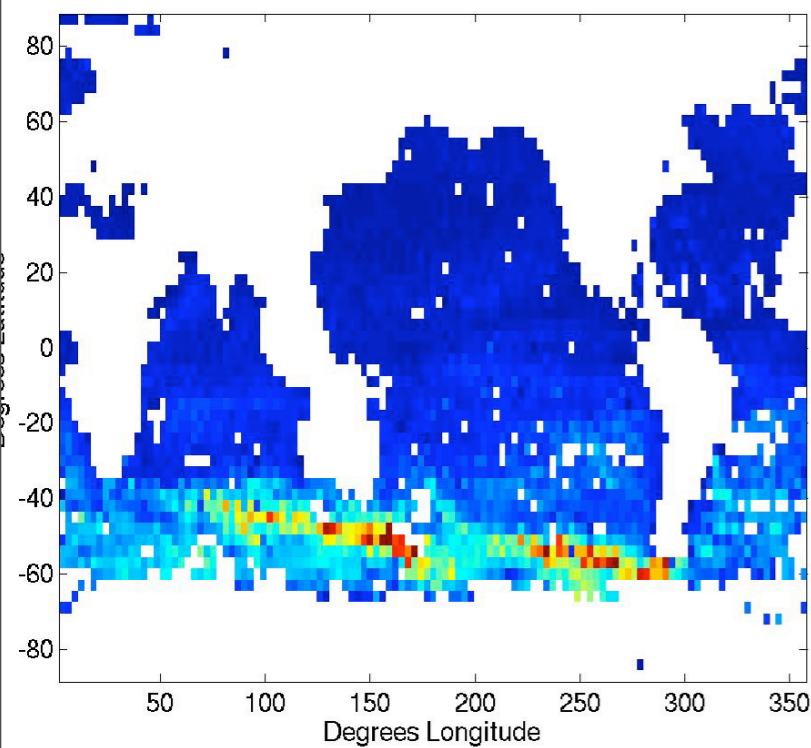
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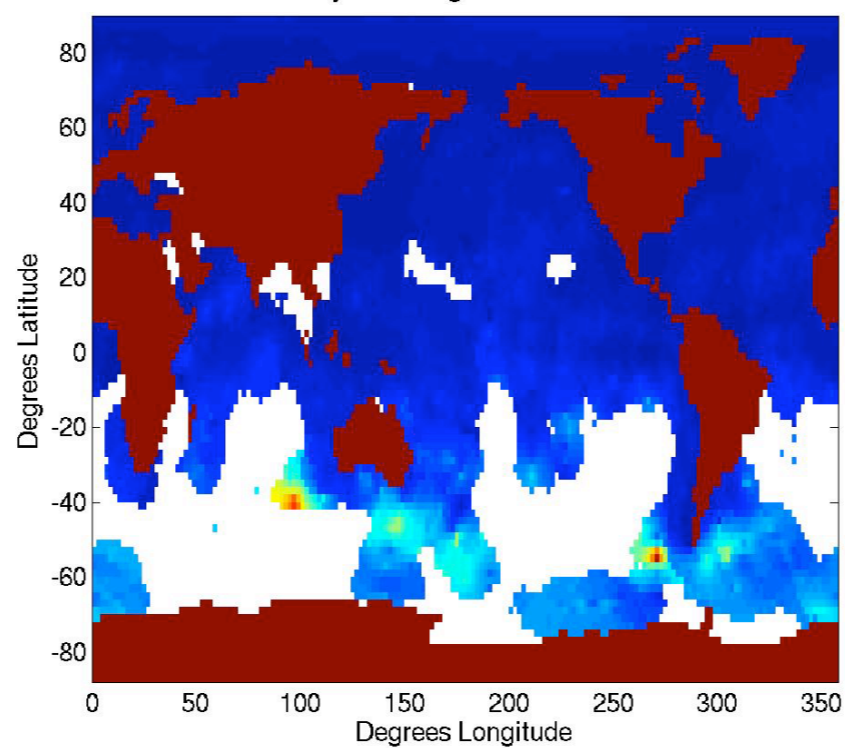
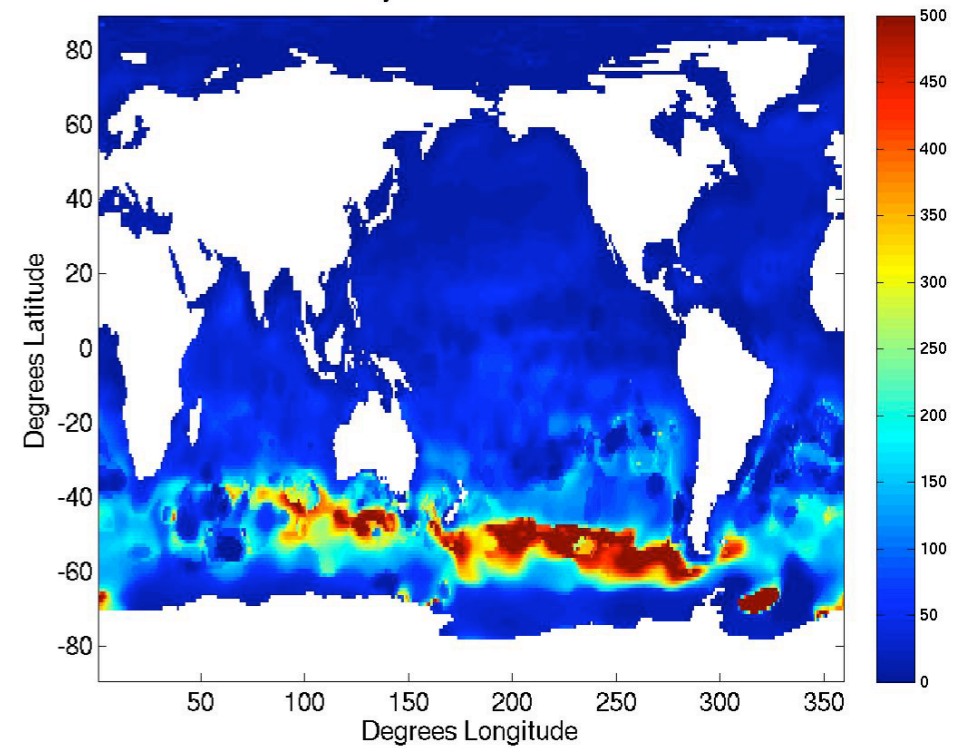GOLD/CM2.2 with MLE param. BLT JAS

GOLD/CM2.2 MLD change due to MLE JAS
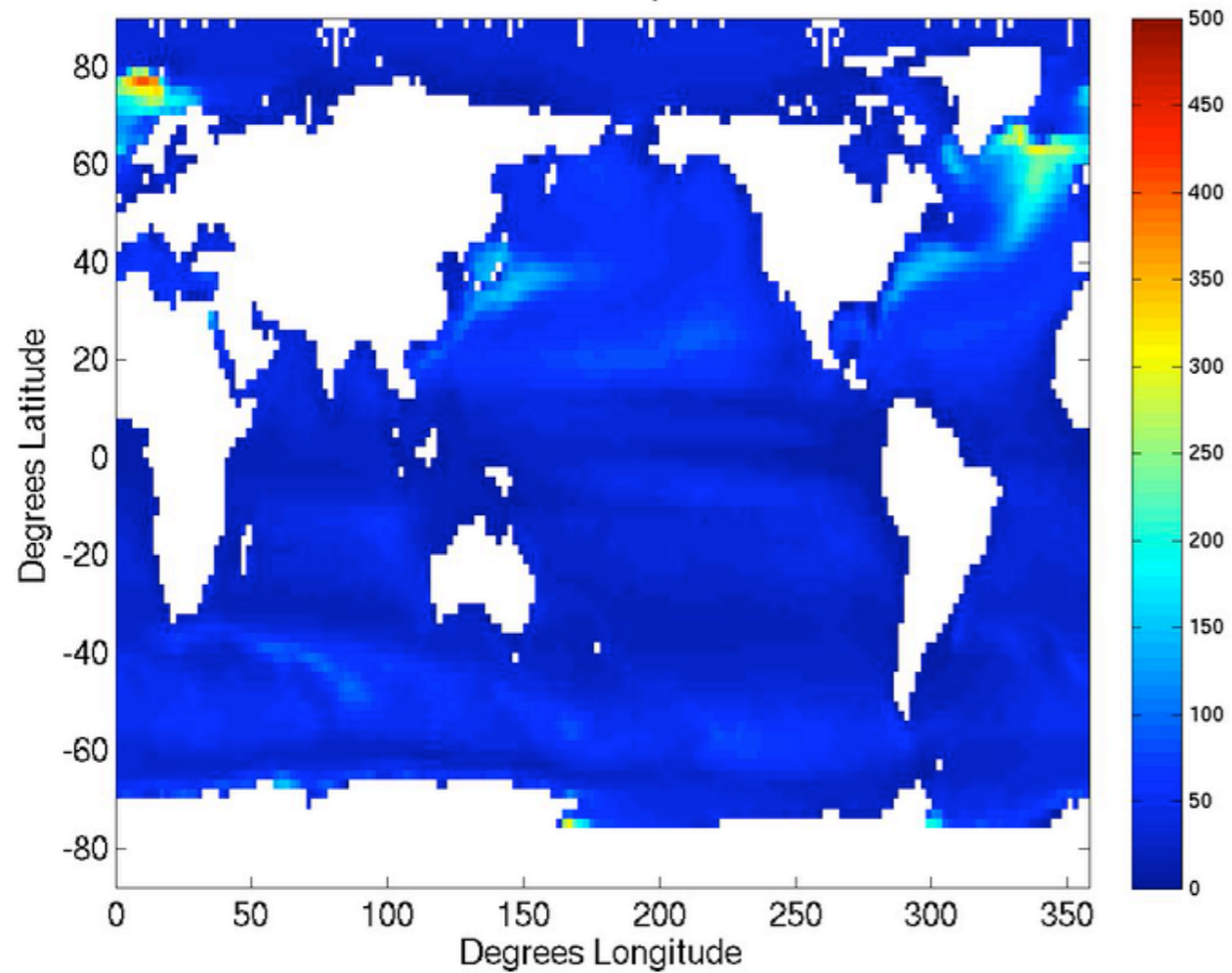
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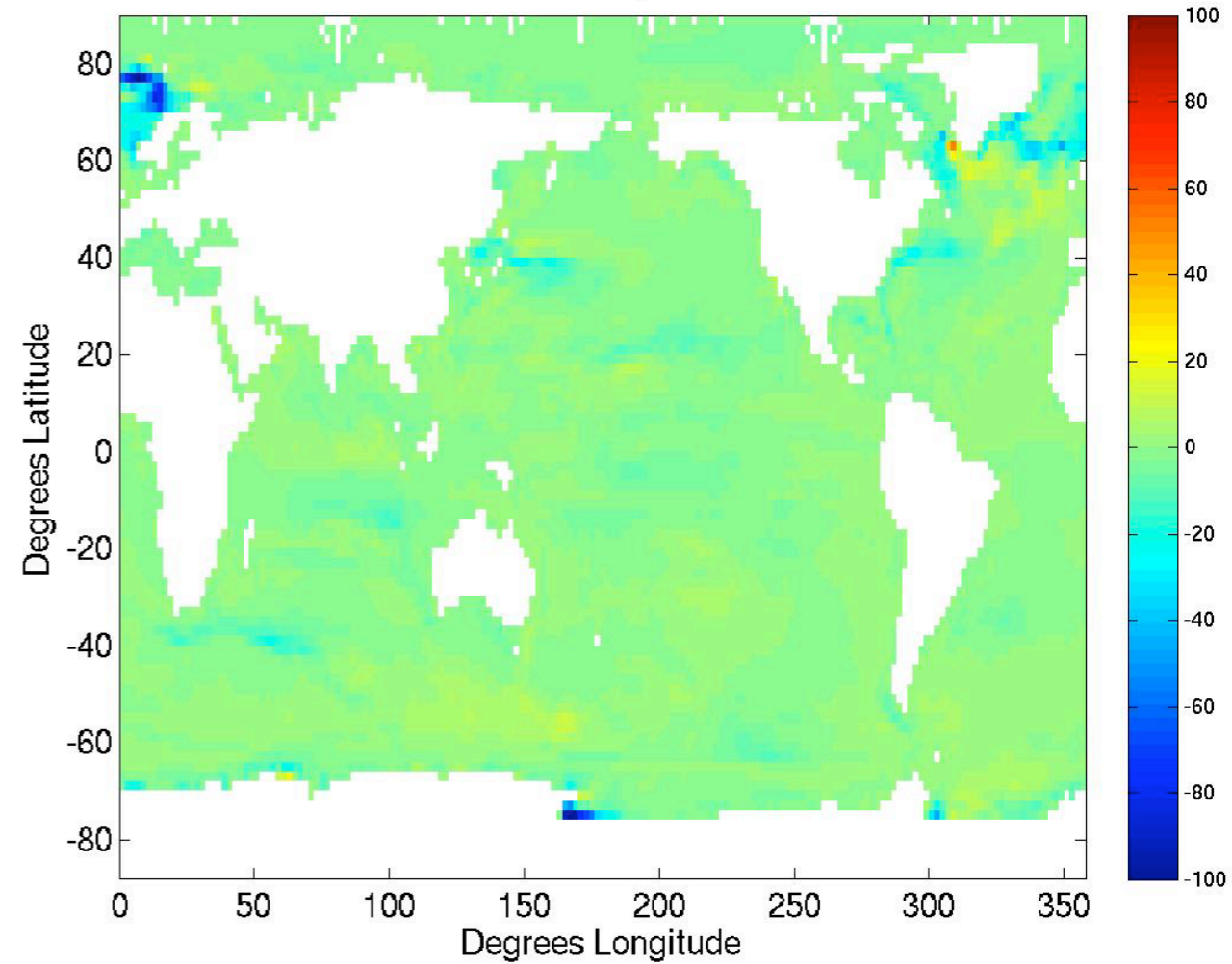
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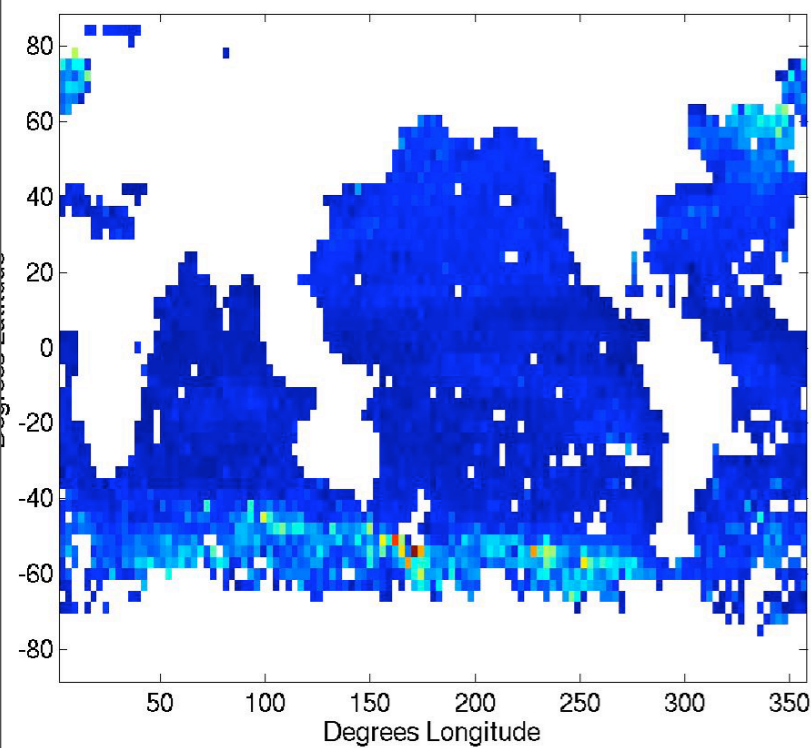
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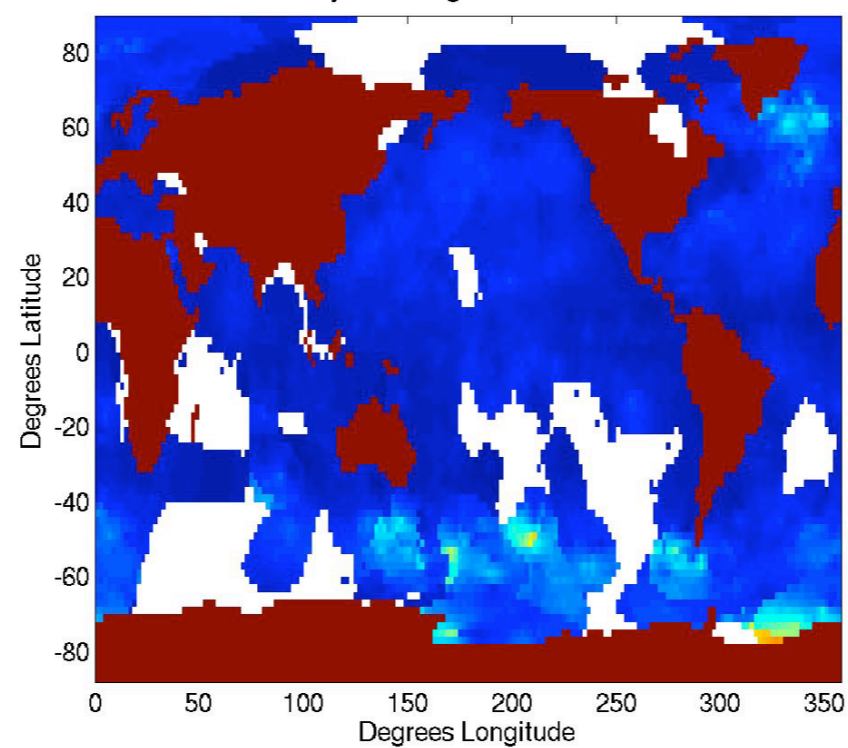
GOLD/CM2.2 with MLE param. BLT OND
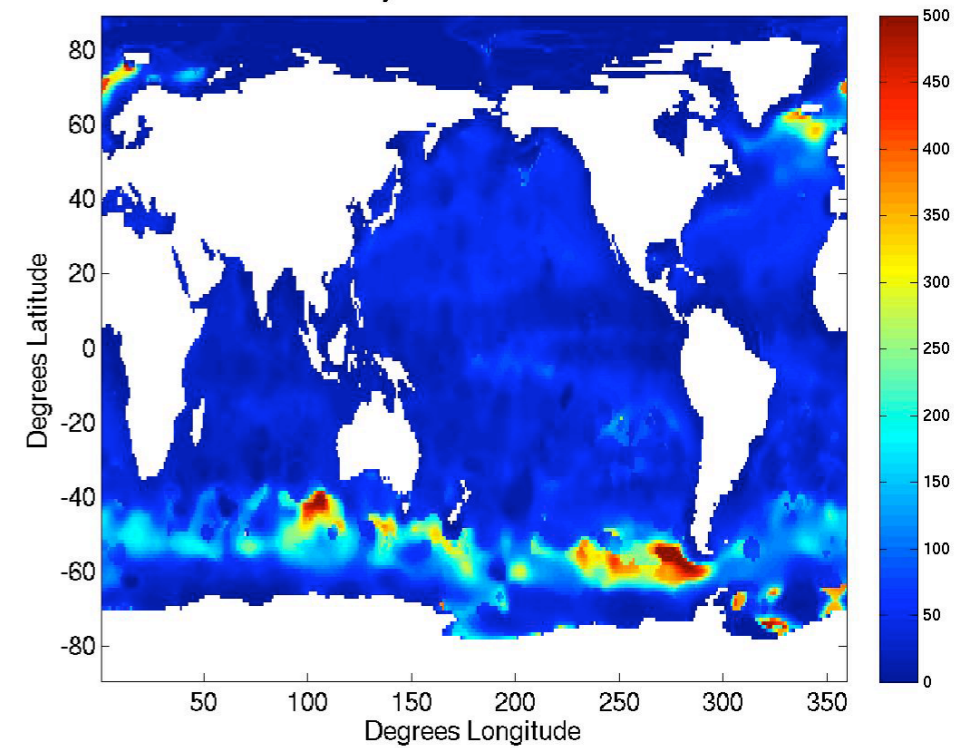
GOLD/CM2.2 MLD change due to MLE OND

ARGO MLD OND

de Boyer-Montegut et al. MLD OND

Monterey and Levitus MLD OND

Publications

- Fox-Kemper, Ferrari, Hallberg: 2008, JPO

- Fox-Kemper, Ferrari: 2008, JPO

- Fox-Kemper, Danabasoglu, Ferrari, Hallberg: 2008 CLIVAR Exchanges

- Fox-Kemper, Danabasoglu, Ferrari, Griffies, Hallberg, Samuels, Peacock: In prep for OMod

- Peacock et al.: In prep.

- Hill et al.: In prep.