Intra-Americas Sea HYCOM

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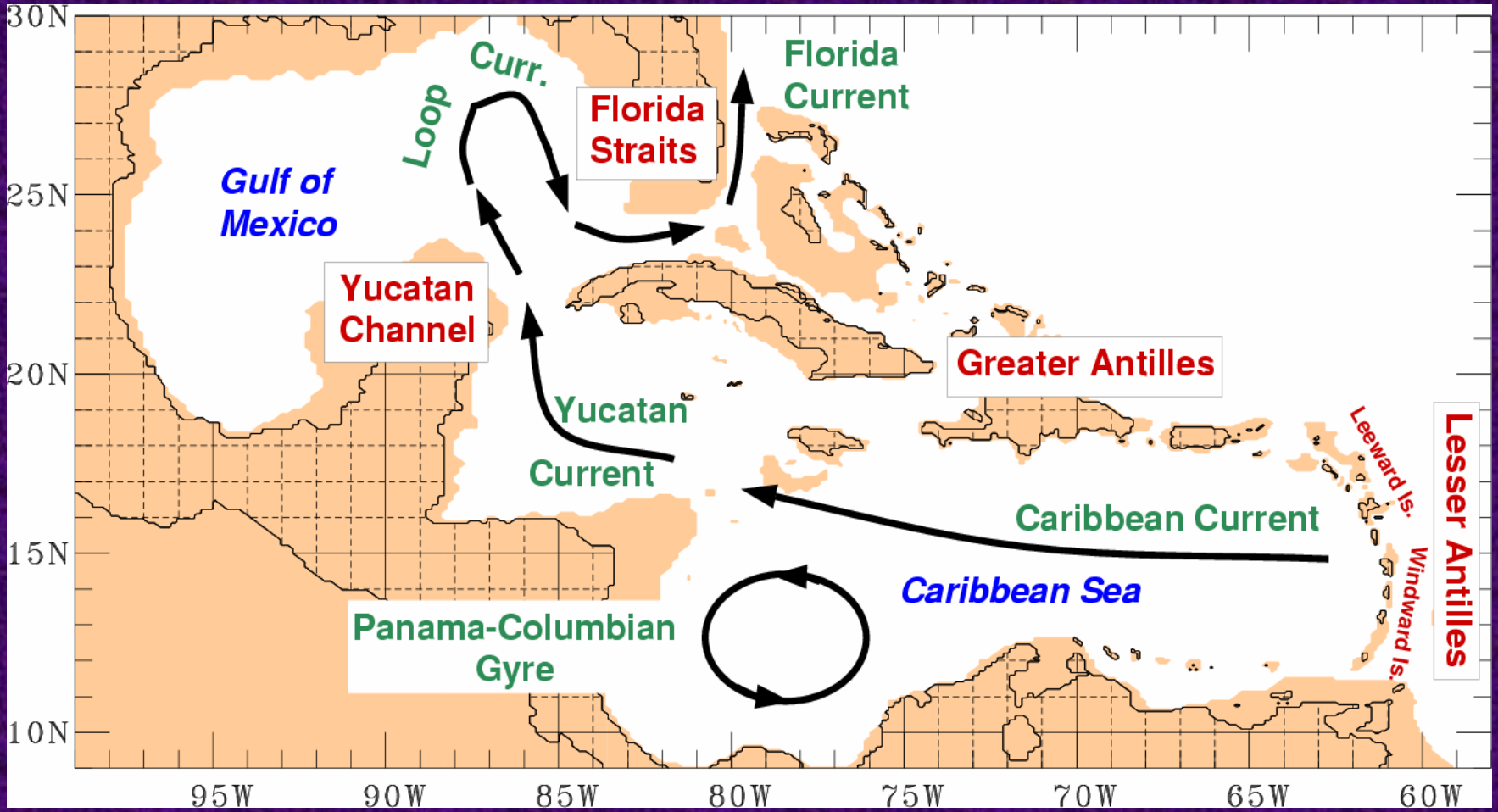
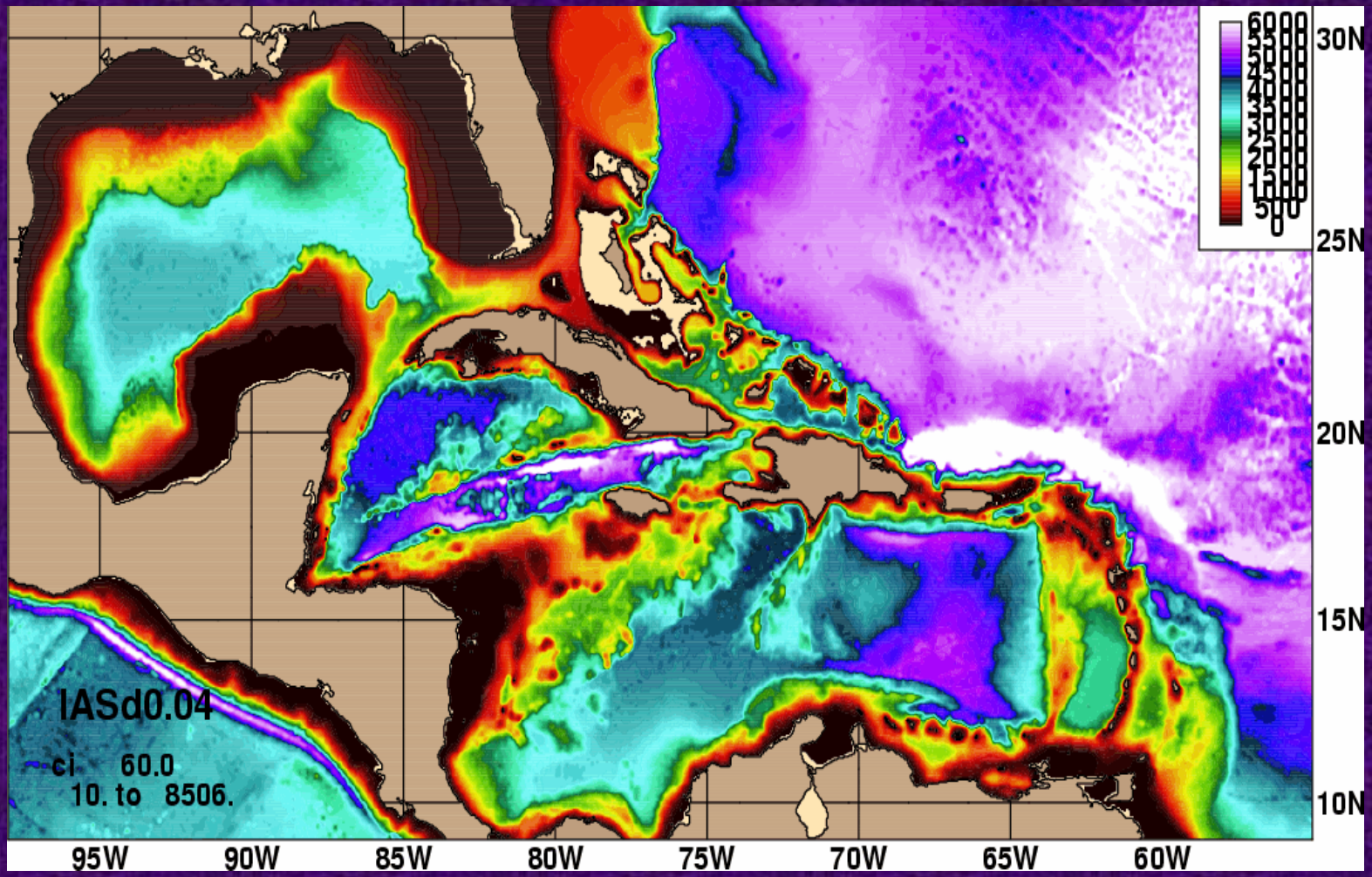
Principal Features of the Intra-Americas Sea Circulation



0.04° IAS-HYCOM Bottom Topography

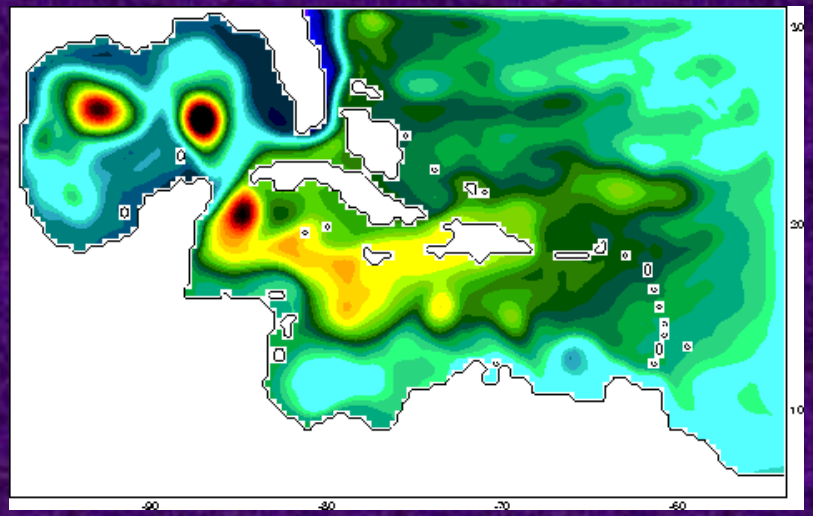
Interpolated from global 2’ x 2’ NRL DBDB2 then modified in specific areas
Coastline: 5 m isobath Minimum depth: 10 m



REALISTIC BOUNDARY CONDITIONS IMPORTANT

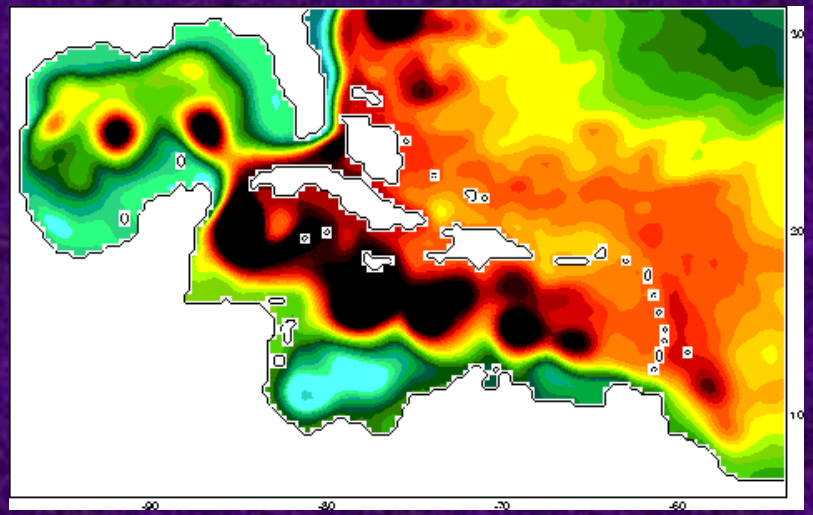
0.32º IAS-HYCOM

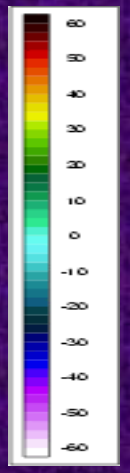
COADS MONTHLY SURFACE FORCING,
RELAXATION TO MODAS
CLIMATOLOGY AT N & E BOUNDARIES
AND 51 SV BAROTROPIC INFLOW
(N & E BNDRY), 10 SV OUT AT SE BNDRY AND
41 SV OUT AT US COAST



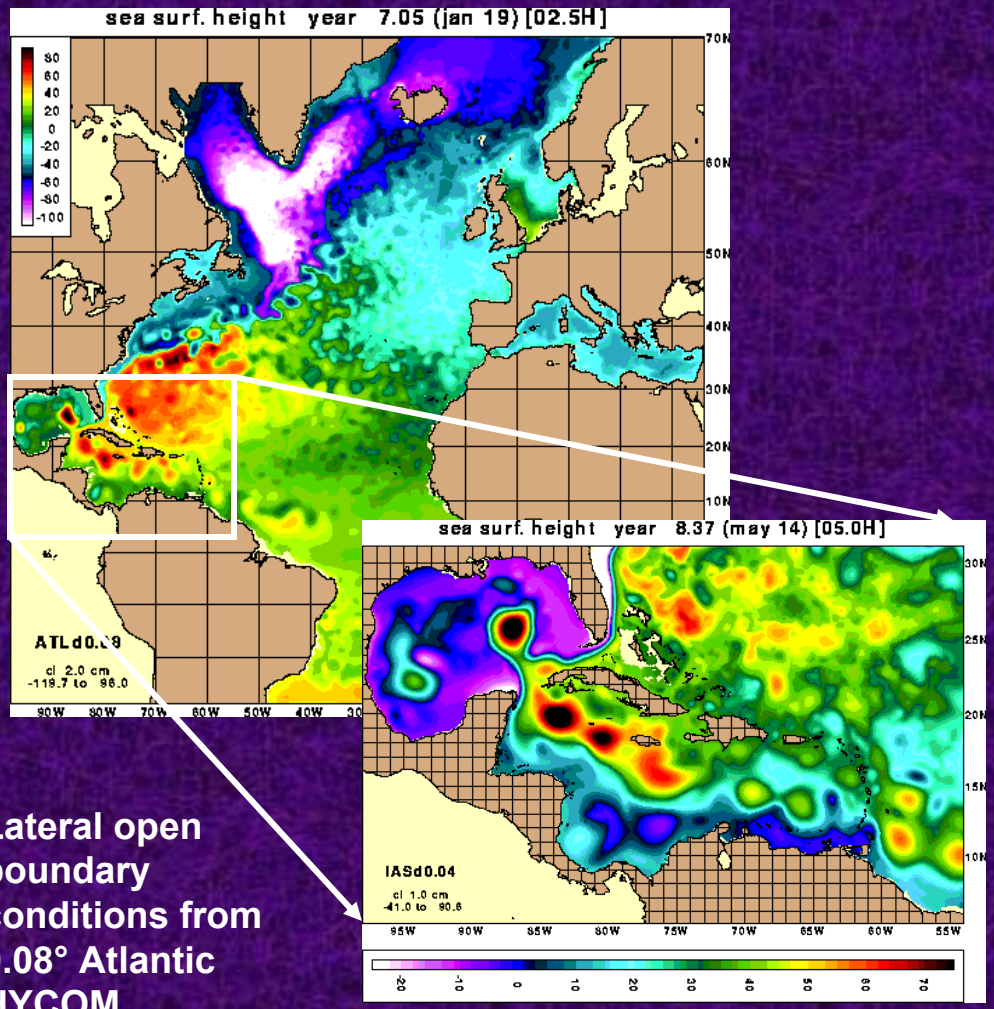
IAS REGION OF 0.32º ATLANTIC-HYCOM

1979-1993 ECMWF REANALYSIS
MONTHLY MEAN SURFACE FORCING
AND RELAXATION TO MODAS
CLIMATOLOGY AT NORTHERN (70ºN) AND
SOUTHERN (28ºS) BOUNDARIES





HYCOM-to-HYCOM Nesting



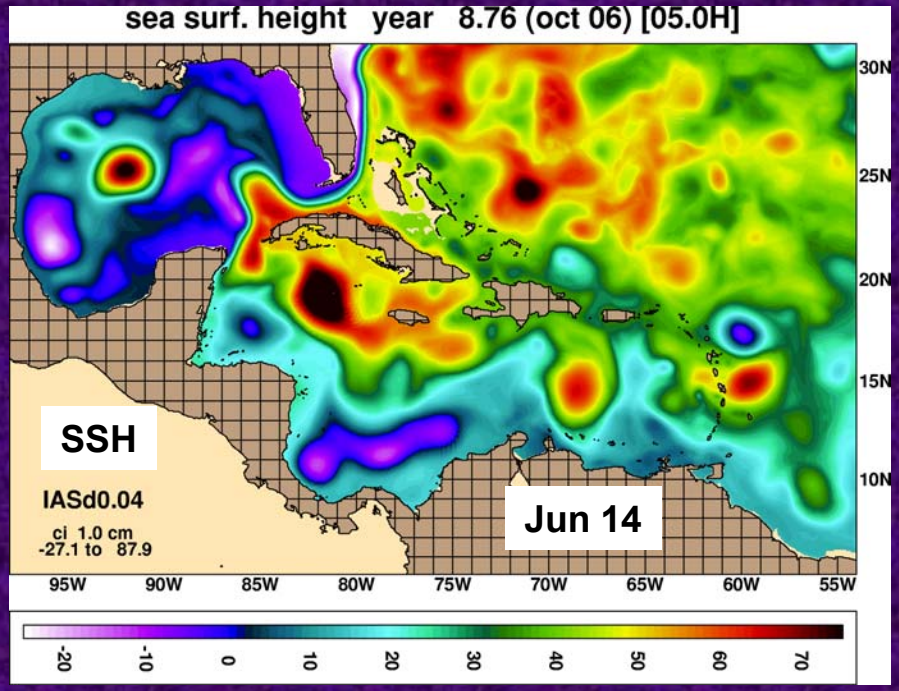
Lateral open boundary conditions from 0.08° Atlantic HYCOM

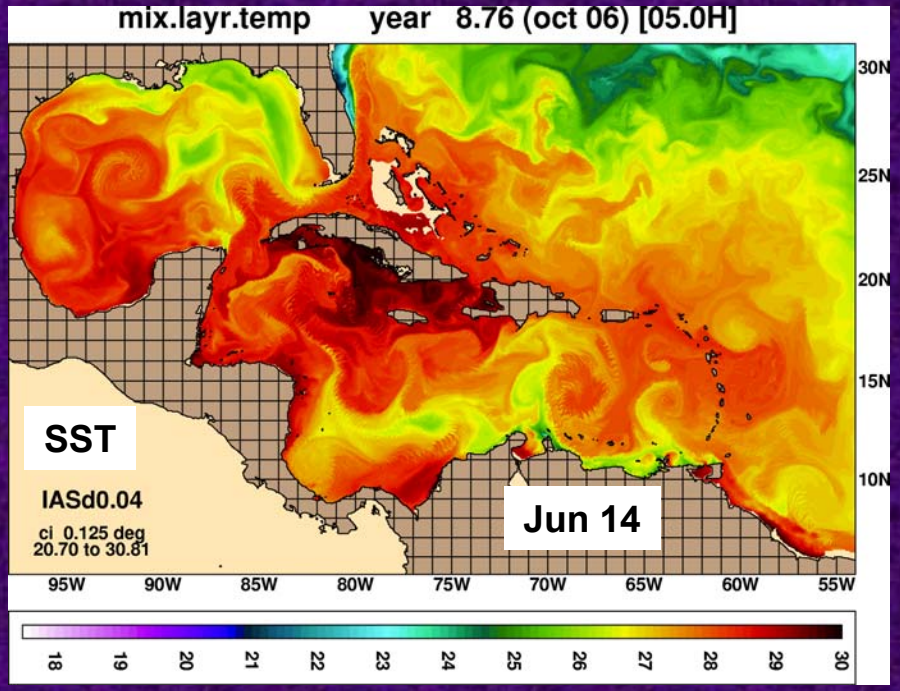
Same vertical structure as Atlantic Ocean model (minus 4 densest layers)

- One-way
- Off-line
  - Boundary info from archive files
  - Updating frequency depends on archive file frequency
- Depth-averaged component exact
- 3-D T,S,P,u,v relaxation
  - ~1° wide buffer zone
  - 0.1-10 day e-folding time
- Extensive open boundaries
- Strong baroclinic throughflows

0.04° Intra-Americas Sea HYCOM

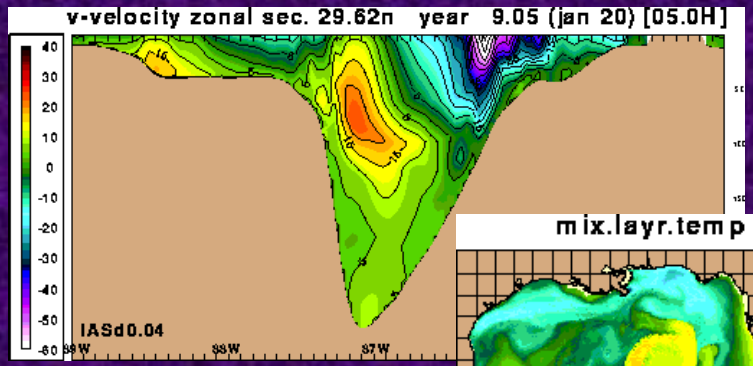
Lateral Boundary Conditions From 0.08° Atlantic HYCOM

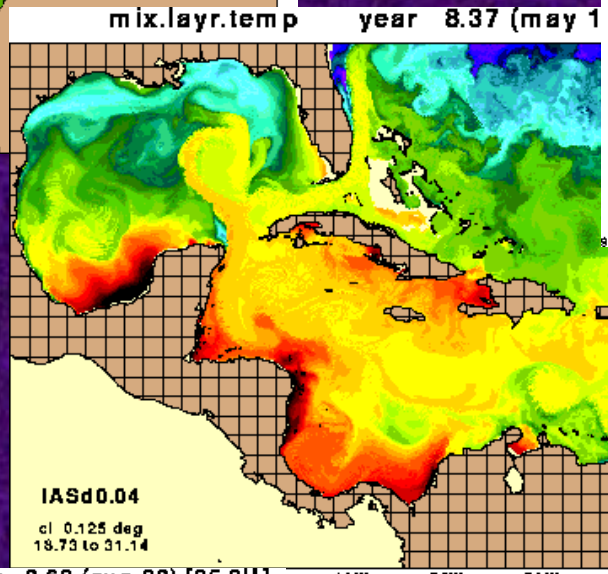


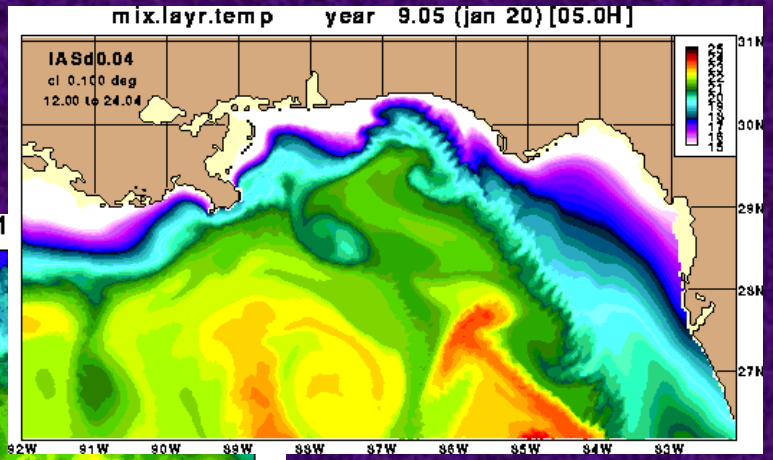


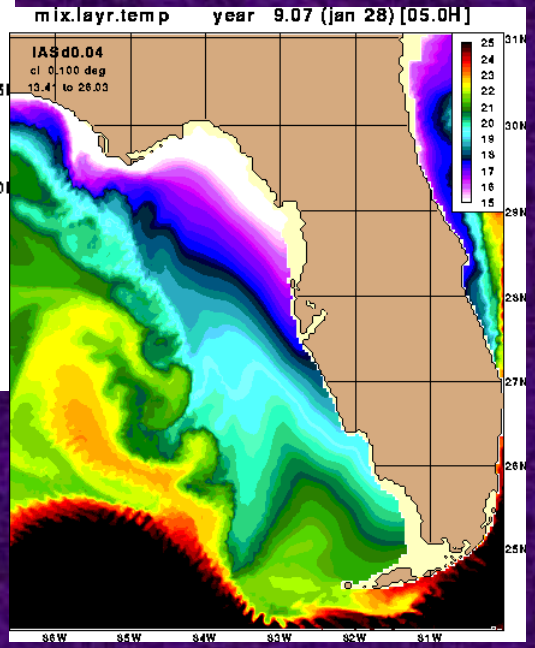
1979-1993 ECMWF Monthly Mean Reanalysis 10 m wind (plus high-frequency anomalies) and heat flux forcing

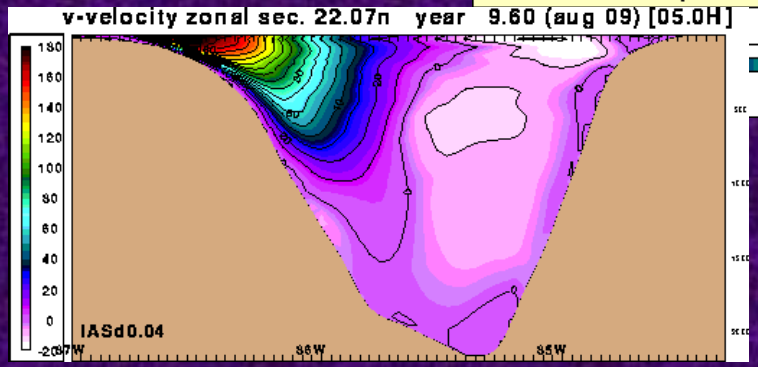
0.04 ° Intra-Americas Sea-HYCOM











Intra-Americas Sea-HYCOM Nesting Issues

- Extensive open boundaries in the deep Atlantic that meet at a corner of the domain
- Strong baroclinic flows through portions of the open boundaries
- Different horizontal grid resolution
- Different vertical structure
- Relaxation time scales
- Buffer zone width
- Update frequency