The Wider Caribbean Region
CARIB-HYCOM domain:

(The extended IAS-HYCOM domain:)
preliminary results from nested simulations

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UM/RSMAS

In Collaboration with
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HYCOM Wider Caribbean Region domain

- 1/24° resolution
- Domain: 98W-35W, 5S-31N

- Nested to HYCOM expt 07.1, global 1/12° (NRL)

- Depth: 5m coastline, merged depth from:
  a) DBDB2 for depth < 10m,
  b) elsewhere interpolated from topography with corrected sills in the NW Caribbean and Florida passages (GLBa0.08 T=7)
- **sigma2** (same layers as GLBa0.08 expt 07.1)
- **Forcing**: (as GLBa0.08 expt 07.1)

  **Thermal forcing**: sea-extrapolated
  **precip**: regression-corrected (GPCP)
  **surface salinity**: relaxation (30 days).

  **Winds**: scatterometer corrected wind
  stress and wind speed, plus 6 hourly
  anomalies (corresponding to NOGAPS
  Jan 2003-Jan 2004)

- **Lateral boundary conditions**: nested (to daily fields of
  year 6 of GLBa0.08 expt 07.1)
- GISS mixed layer
Seasonal variability in the advection of Amazon and Orinoco low salinity / high nutrient waters
February SSS (daily snapshot)
MODIS climatology – February (monthly mean)

Provided by Viva Benzon, RSMAS satellite group
Provided by Viva Benzon, RSMAS satellite group
CARIB domain

Brazil Current rings (MICOM)
 Nested ROMS Model

(ROMS: H. G. Arango, Rutgers University and A.F. Shchepetkin, UCLA)

- stretched, terrain-following coordinates in the vertical, 25 layers

- orthogonal curvilinear coordinates in the horizontal (163x221, parent grid, 1.7km)

- Split-explicit time-stepping scheme (Shchepetkin and McWilliams, 1998), dt=240s (no tides).

- Advection scheme: third-order, upstream biased. => velocity-dependent hyper-diffusion dissipation (Shchepetkin and McWilliams, 1998).

- nested weekly (off-line nesting) with the larger scale HYCOM (global / CARIB)
ROMS topography: USGS gtopo30 (~ 1km)
HYCOM SSS and currents

ROMS SSS and currents

June 1
HYCOM SSS and currents

ROMS SSS and currents

June 15
HYCOM SSS and currents

ROMS SSS and currents

June 30
June (mean)
Caribbean historical data set
1978-2007
(NOAA/AOML)
Dry Season (Jan-Jul)

Wet Season (Aug-Dec)
EKE

Dry Season (Jan-Jul)

Wet Season (Aug-Dec)
Mean Velocity (from drifters)
Mean Velocity (from HYCOM)

mix.lyr. velocity mean: 5.00 - 6.00 [07.1H]
# Mean Transports in the IAS

<table>
<thead>
<tr>
<th>Expt.</th>
<th>FC 27°N</th>
<th>Abaco northward</th>
<th>FC + Abaco</th>
<th>NWP</th>
<th>OBC</th>
<th>Yuc Chan</th>
<th>WW</th>
<th>Mona</th>
<th>Aneg</th>
<th>Less Antil</th>
<th>Lucia Vince Gren</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs.</td>
<td>30-34</td>
<td>5</td>
<td>37</td>
<td>-1.2</td>
<td>-1.9</td>
<td>23-27</td>
<td>-7.0</td>
<td>-2.6</td>
<td>-2.5</td>
<td>-17.1 (resid)*</td>
<td>-10.1</td>
</tr>
<tr>
<td>05.2 (7-9)</td>
<td>24.0</td>
<td>8.0</td>
<td>31.8</td>
<td>-2.2</td>
<td>0.0</td>
<td>22.3</td>
<td>-3.6</td>
<td>-2.1</td>
<td>-4.2</td>
<td>-12.1</td>
<td>-8.3</td>
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<tr>
<td>05.6 (9-13)</td>
<td>24.9</td>
<td>3.1</td>
<td>26.9</td>
<td>-2.4</td>
<td>-0.3</td>
<td>22.6</td>
<td>-2.8</td>
<td>-2.4</td>
<td>-4.6</td>
<td>-12.5</td>
<td>-8.0</td>
</tr>
<tr>
<td>07.1 (4)</td>
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<td>8.0</td>
<td>34.4</td>
<td>-2.5</td>
<td>0.7</td>
<td>24.6</td>
<td>-0.2</td>
<td>-2.2</td>
<td>-4.7</td>
<td>-17.5</td>
<td>-11.7</td>
</tr>
</tbody>
</table>

* Positive transport defined northward and eastward
# Residual of Yucatan – WW – Mona - Anegada
END