

Effects of the Middle-Miocene Antarctic Glaciation on the Indonesian Throughflow



**Network Training Activity 6
Carboneras, 8th-11th October 2012**

Amanda Frigola,
Matthias Prange,
Michael Schulz

- ✓ **Improvements in the Panama topography/bathymetry dataset**

- ★ Based on the publication “Evidence for middle Eocene and younger land emergence in central Panama: Implications for Isthmus closure”, by Montes et al. 2012

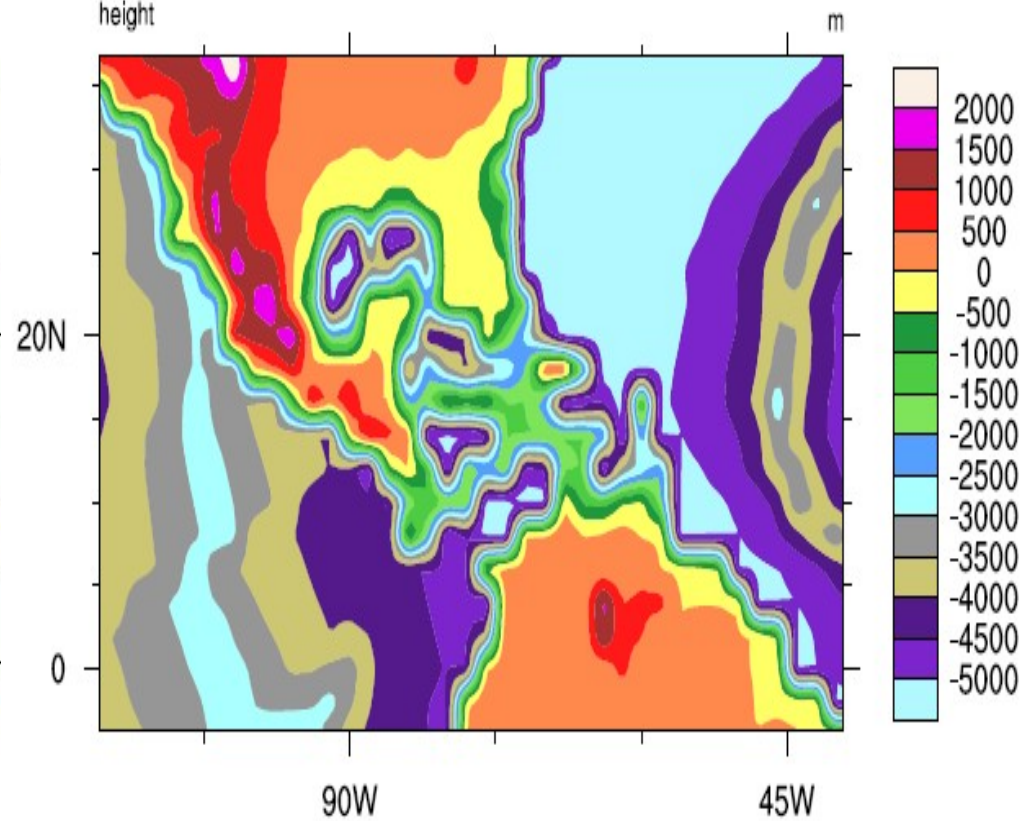
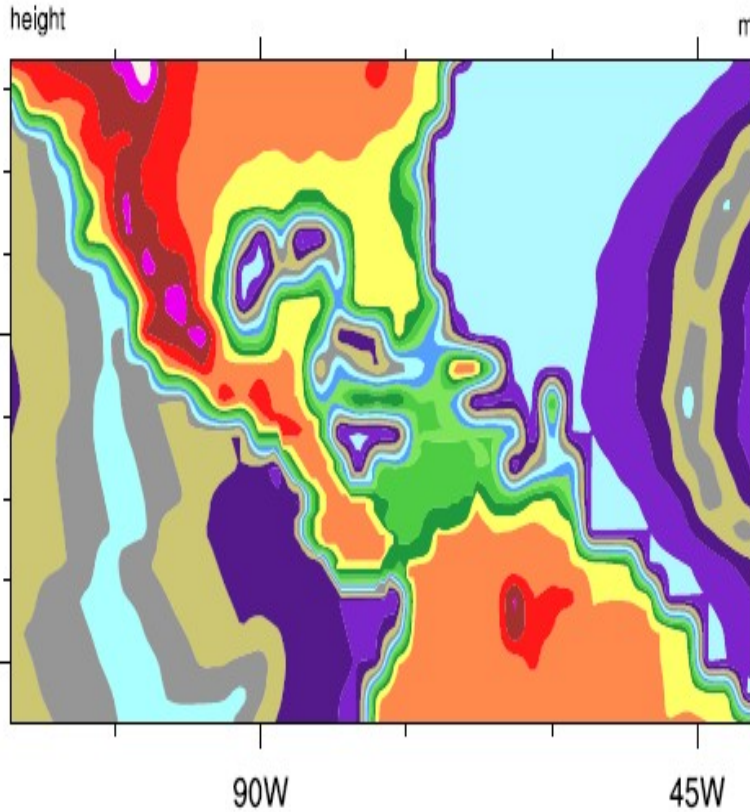
- ★ Passage width: ~200 km

- ★ Passage depth: ~1000 m

Panama passage

Montes

Herold



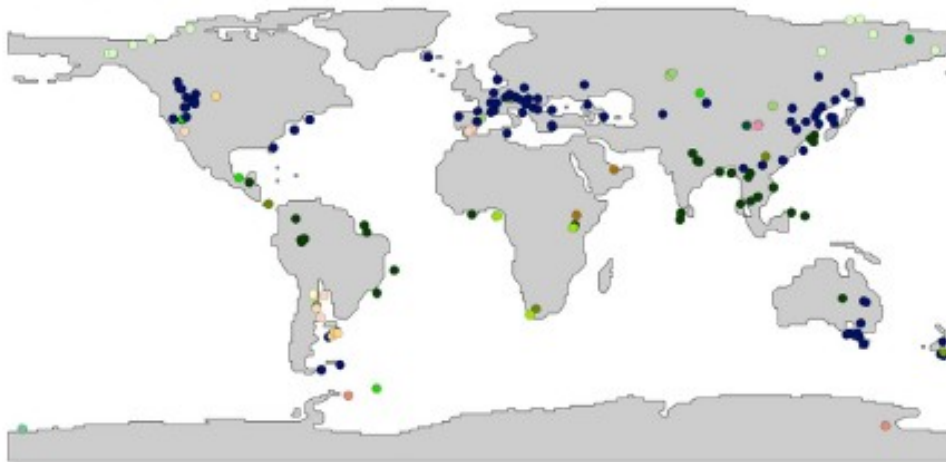
Topography/bathymetry of the Panama passage during Middle-Miocene

- ✓ **Removal or widening of one grid cell wide channels**
(the ocean model will not be able to compute flow with one grid box)
- ✓ **Removal or widening of small and shallow bays**
(can cause unrealistic salinity values)

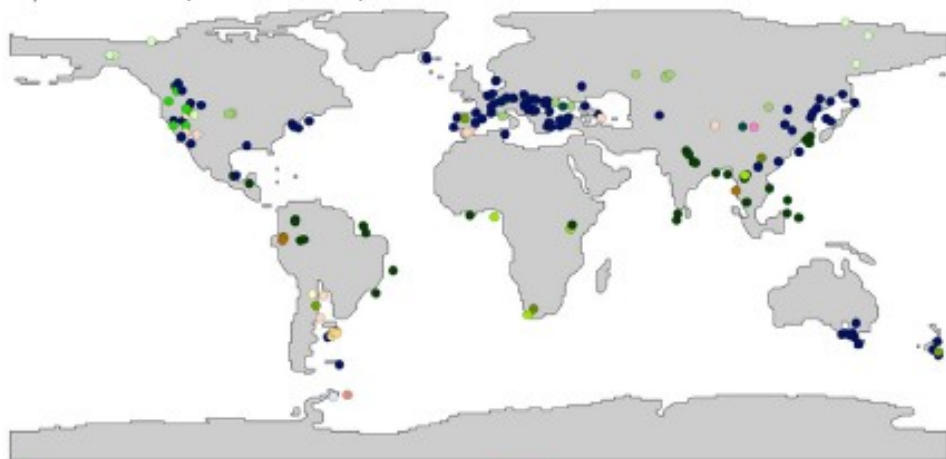
- ✓ **Creation of a global vegetation dataset for the Middle-Miocene**

- ★ Based on the publication “Global vegetation dynamics and latitudinal temperature gradients during the Mid to Late Miocene (15.97-5.33 Ma)” by Pound et al. 2012

A) Langhian (15.97-13.65 Ma)



B) Serravallian (13.65-11.61 Ma)



Progress of the PhD project

vegetation distribution of the Langhian and Serravallian from paleobotanical data, translated into the 28 biome scheme of the BIOME4 model



Pound et al. 2012

7.5 LSM vegetation types

No Vegetation	
0	ocean
1	land ice
2	desert
Forest	
3	cool needleleaf evergreen tree
4	cool needleleaf deciduous tree
5	cool broadleaf deciduous tree
6	cool mixed forest
7	warm needleleaf evergreen tree
8	warm broadleaf deciduous tree
9	warm mixed forest
10	tropical broadleaf evergreen forest
11	tropical broadleaf deciduous tree
Interrupted Woods	
12	savanna
13	evergreen forest tundra
14	deciduous forest tundra
15	cool forest crop
16	warm forest crop
Non-woods	
17	cool grassland
18	warm grassland
19	tundra
20	evergreen shrub land
21	deciduous shrub land
22	semi-desert
23	cool irrigated crop
24	cool crop
25	warm irrigated crop
26	warm crop
Wetland	
27	forest wetland
28	non-forest wetland

vegetation scheme used by the
CCSM3 setup scripts

- ✓ **Seasonal and interannual variability of SST and precipitation**
(Viola Warter)
- ✓ **Mean Annual Range in Temperature (MART)**
(Emanuela di Martino)

- ✓ **Land surface settings**
(vegetation distribution and river runoff directional dataset)
- ✓ **Create the mapping files**
- ✓ **Run the model with the greenhouse and icehouse configurations**
- ✓ **Compare model results with proxy data**



