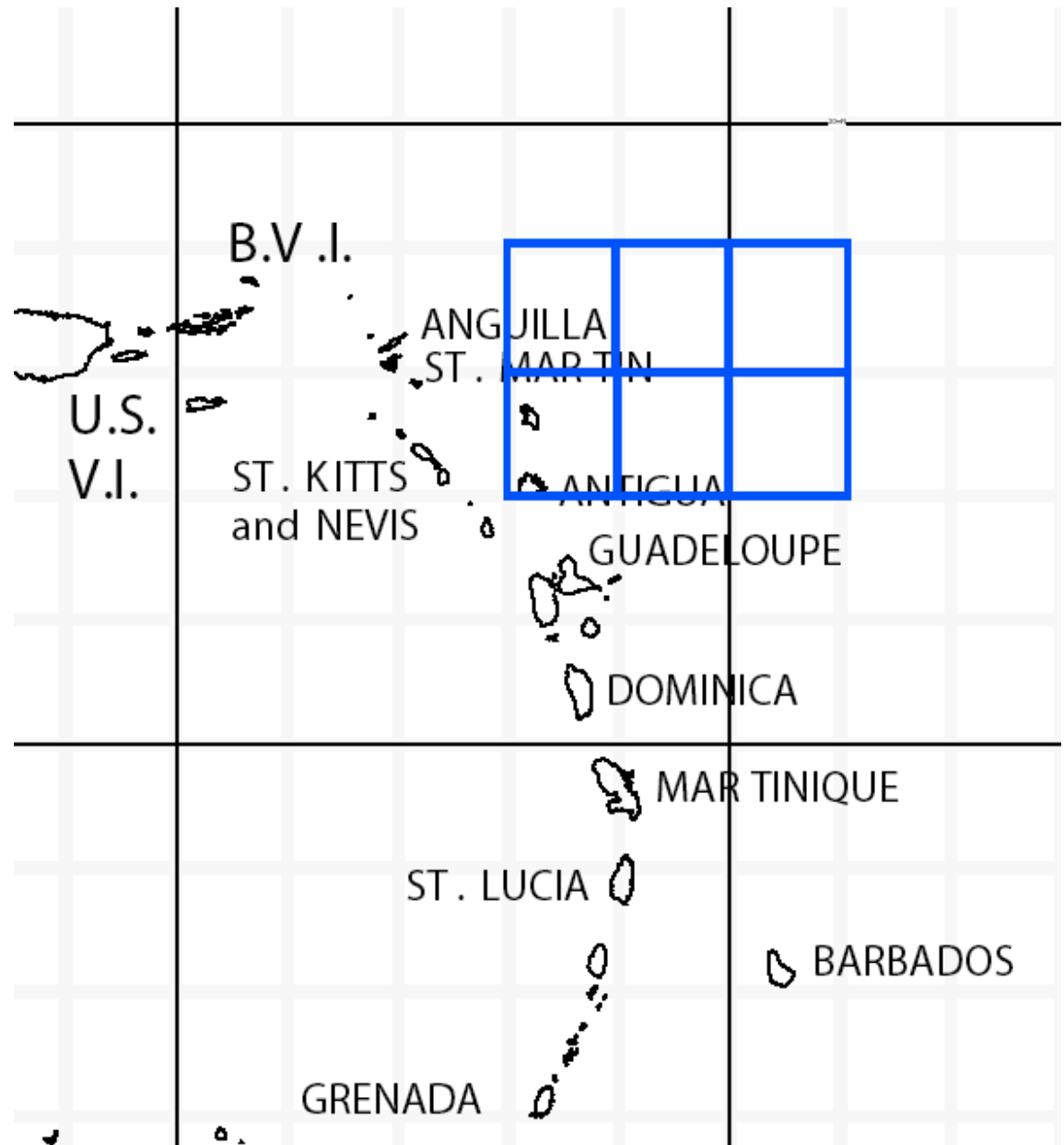


NCEP GFS Column Output

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Column Output from NCEP GFS

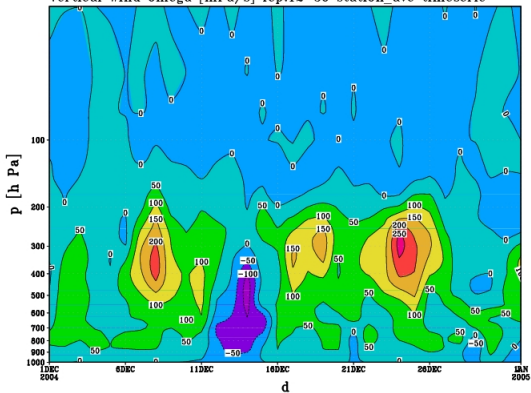
- Thanks to Hualu Pan and Fanglin Yang, NCEP
- 48-hr forecasts (T254L64) initialized at 00 and 12 UTC.
- Output every 3 hrs for 6 locations from Nov 2004 thru March 2005.
- Output available on native model coordinate (64 sigma levels) or interpolated to pressure coordinate (25-mb intervals).
- Output includes vertical velocity, horizontal advective tendencies of temperature and water vapor, surface fluxes, and SST, in addition to standard variables (T, q, u, v).
- Actual locations: (15.5, 16.5) N (59.5, 60.5, 61.5) W



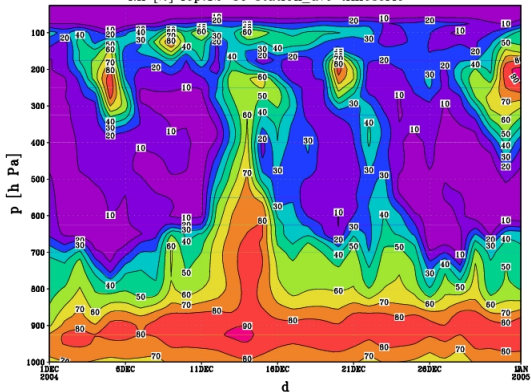
Goals and Plans

- Develop a large-scale analysis suitable for driving cloud-resolving model simulations.
 - Large-scale vertical velocity in particular is required, but is not easily measured.

Vertical Wind omega [mPa/s] fcp:12-36 station_ave timeserie



RH [%] fcp:12-36 station_ave timeserie



- Evaluate NCEP GFS for RICO region and period.
 - Rainfall rate and relative humidity are correlated with large-scale vertical velocity, so we will compare GFS output to radar rainfall rates and to RH from soundings.

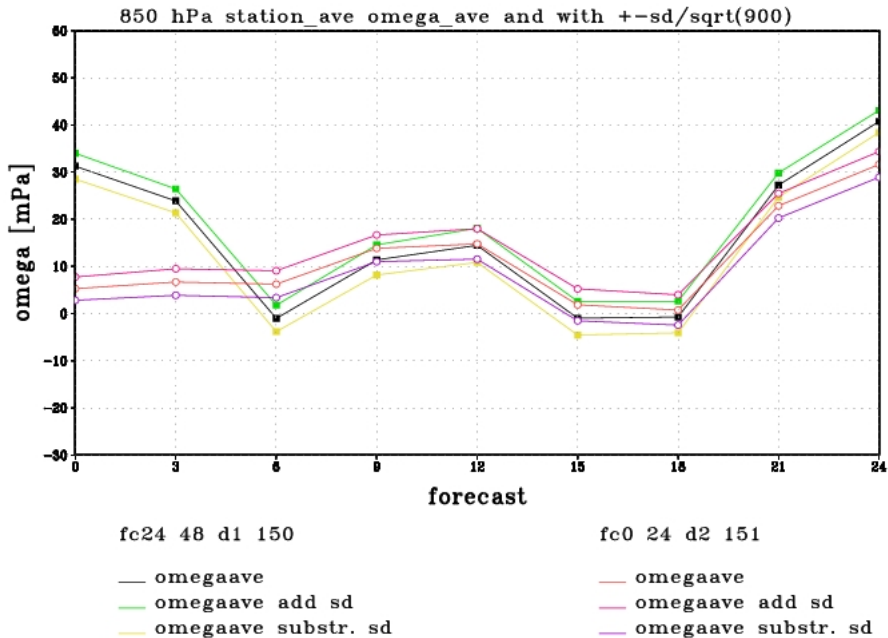


Figure 1.5: Model derived ω averaged over 150 days for the forecastperiod of 0-24 hours and the forecastperiod of 24-48 hours with the standard deviation normalized by the amount of days averaged for the 6 stations averaged.

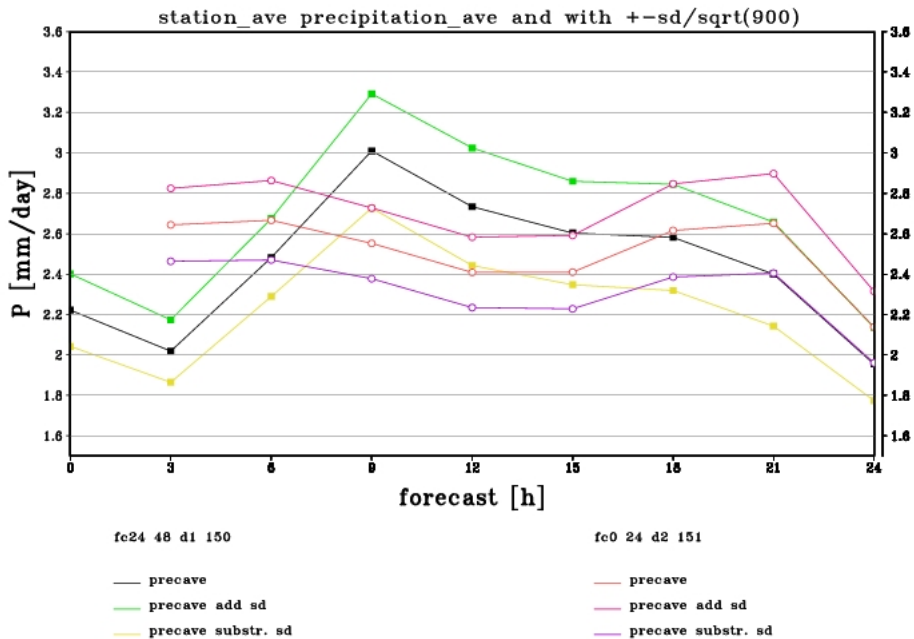


Figure 1.8: Model derived precipitation averaged over 150 days for the forecast-period of 0-24 hours and the forecastperiod of 24-48 hours with the standard deviation normalized by the amount of days averaged for the 6 stations averaged.

We will also perform high-resolution 3D large-eddy simulations (LES) of cumulus clouds in order to:

- evaluate the LES approach by comparing LES fine-scale structure to RICO measurements,
- study the (simulated) entrainment/detrainment process,
- evaluate the EMPM's entrainment parameterization,
- collect realistic trajectories for driving the EMPM.
- We eventually plan to better resolve the SGS structure in a 3D LESM by implementing a 1D subgrid-scale (SGS) mixing model with a grid size of about 10 cm, a scale of variability that is measurable by aircraft.