

# Optional PS: Mapping

September 14, 2023

1. Download `sst.ltm.nc` from class GitHub into the same folder where you plan to write code. This is the long-term mean of SST from observations interpolated onto a rectangular grid.
  - (a) Load the SST data into your platform of choice (MATLAB or Python/Xarray)
  - (b) Initialize a map using a Mercator projection with continents filled in with grey shading. Add rivers as thick blue lines.
  - (c) Plot the mean SST data as a filled contour plot using a sequential colormap.
  - (d) Plot the SST data as anomalies from the global mean as a filled contour plot using a divergent colormap.
  - (e) Make another map of SST anomalies from the global mean using a more sensible projection (something that doesn't exaggerate the poles)
  - (f) Make a map of regional SST within 500 km of Savannah, GA using a projection that is appropriate for the smaller domain. Plot elevation over land areas, rivers and indicate the location of Savannah with a marker and a text label.
2. Download `ARGOtraj.zip` from class GitHub into the same folder where you plan to write code. This includes a series of NetCDF files with the ARGO drifter buoy location data near the East Coast of the US for the first few weeks of August 2023.
  - (a) Load all the drifter latitude/longitude data into a reasonable data type in your preferred platform.
  - (b) Make a regional plot of the Western Atlantic using a reasonable projection. Shade the coastline.
  - (c) Plot all drifter data on this map with each drifter plotted as a different color.
  - (d) Make another plot with all drifter data with each trajectory colored by the speed of the drifter at that time. Make sure to include a colorbar with a reasonable colormap.