The Adaptive Ecosystem Climatology (AEC) components:
- Earth Observations (EO) from satellites
- in-situ data (from archives)
- observations collected by amateur observers (crowdsourcing)
- output from a data assimilative, coupled bio-optical physical ocean model system

The AEC mitigates the shortcomings of the components and combines their strengths to enhance decision-making activities of our end-user, partner organizations (NOAA, BOEM, and EPA).

Products:
- Multi-dimensional, dynamically balanced, gridded climatology for each calendar day
  - temperature
  - salinity
  - sea surface height
  - currents
  - nitrate
  - silicate
  - phosphate
  - chlorophyll

- a flexible, on-line tool (hosted by NOAA) so the resultant AEC fields can be:
  - unaveraged
  - sub-sampled
  - averaged
  - downloaded in a variety of formats

- analysis tools:
  - time series
  - virtual buoy
  - visualization of satellite, model, and AEC fields
  - animations
  - Google Earth Tour
  - estimates of uncertainty and sensitivity

Forecasting applications:
- management/analysis models
- initil and/or boundary conditions

The Adaptive Ecosystem Climatology (AEC) serves as a "first guess" provided by a "static climatology" constructed from a multi-decadal simulation run of the NCOD-CGCM model system. This provides representative historical mean conditions for a region, useful for the following example. The AEC includes nowcasting and forecasting for each calendar day (map image). AEC rapidly derives an analysis field(s) with the added value of providing subsurface prediction, as shown in (d) and (e) below illustrating the depth of the chlorophyll reservoir across the basin (dynamic feature indicated by the vertical black line in (c)). NOTE: example file only, temporal/spatial weighting functions not yet determined.

AEC visualization and data distribution. An overall view of the Gulf of Mexico for an individual test file of the salinity product (a). A zoomed-in portion of the Gulf of Mexico (b) displaying the list of available options for downloading the chunk of data displayed on the map image. An html table (c) generated by the "ExportTable" file type selection.

AEC crowdsourcing. A mobile web site is in development for submitting and viewing science data collected by students and the general public. Ocean sampling kits (OSKs) are being prototyped with a local (Mississippi coast) secondary school.