NOAA'S ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY

MIAMI, FL

ECONOMIC VIABILITY

Observing systems are more cost effective and allow for strategic evolution of emerging technology.

TIME EFFICENCY

Time lags between instrument deployment and operational integration are reduced with OSSE integration.

QUANTITATIVE IMPROVEMENTS

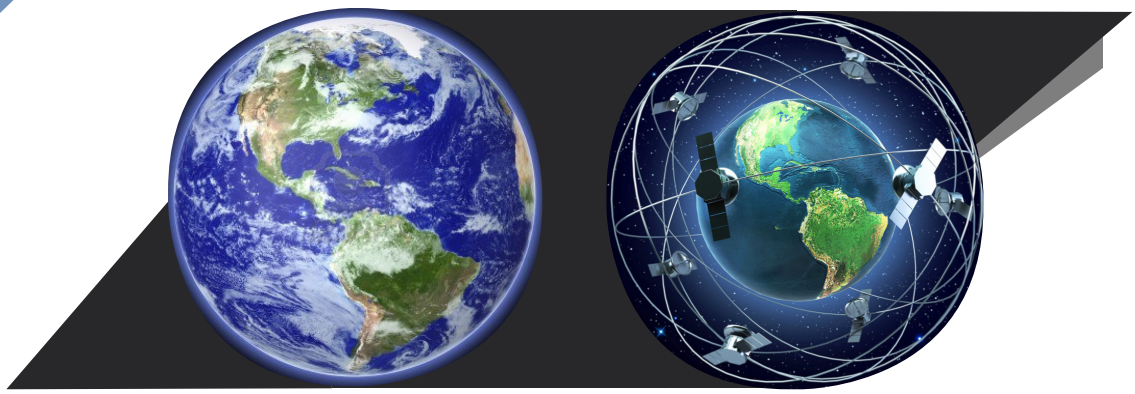
Effectiveness of new instrumentation is assessed. Integration response is predicted for various instrument configurations, and impacts of data assimilation are diagnosed.

OBSERVING SYSTEM SIMMULATION EXPERIMENTS

AOML conducts Observing System Simulation Experiments (OSSEs) to assess the impact of large and expensive observing systems prior to deployment.

THE QUANTITATIVE OBSERVING SYSTEM ASSESSMENT PROGRAM

QOSAP improves existing atmospheric, oceanic, and coupled models by performing simulation experiments to evaluate the tradeoffs and impacts of different observation types across NOAA Line Offices. These studies aid NOAA management by determining accuracy, cost-efficiency, and viability of observations within various model designs.



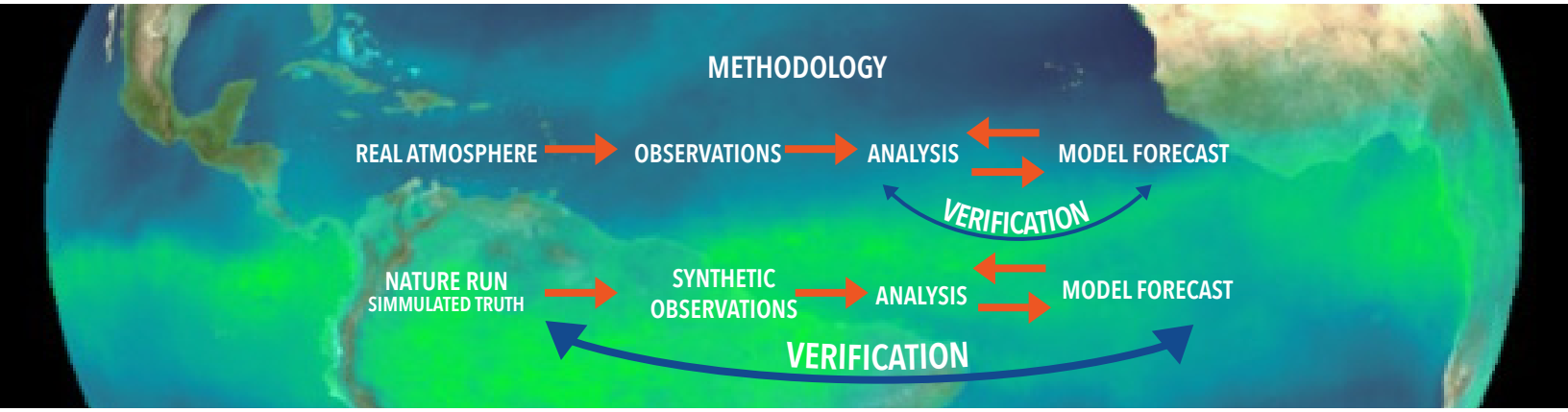
KEY OSSE RESULTS

Developed First Regional Ocean OSSE for the Gulf of Mexico.

Utilized OSSEs for GNSS Radio Occultation and Geostationary Hyperspectral sounders.

Integration of both manned and unmanned aircraft improving hurricane track and intensity forecasts.

Developed and validated a new global OSSE system.



THINKING ABOUT PEFORMING AN OSSE?

- ✔ Is the system realistic?
- ✔ Is the OSSE system appropriate for the impacts of interest?
- ✔ Are the caveats associated with the OSSE system well-known?
- ✔ Will the OSSE be completed quickly?

COMPONENTS OF AN OSSE

1. "Nature Run" is a proxy for real atmosphere and ocean.
2. Truth is known.
3. Existing and proposed observations can be simulated.
4. Simulated observations should be as realistic as possible.
5. The impact of proposed observations can be evaluated.

The Weather Research and Forecasting Innovation Act of 2017 specifically mandates NOAA to perform OSSEs to quantitatively assess the relative value and benefits of observing capabilities and systems.