

Concept of Operations

ADIOS is an initial oil spill response tool for emergency spill responders and contingency planners. The program integrates a library of oil properties with a short-term oil fate and cleanup model to estimate the amount of time that spilled oil will remain in the marine environment, and to develop cleanup strategies. It will also provide weathering information to NOAA's oil spill trajectory program, GNOME2.

The target audience of ADIOS3 will be the oil spill response command, particularly on-scene commands connected to the USCG. Its basic output will be information that can complete the Incident Command System (ICS) form 209 (oil budget).

The minimum requirements for the model are:

- ADIOS3 must be able to run on easily accessible oil property, source, and environmental data
- ADIOS3 must provide information in a format useful to planning and cleanup decisions
- ADIOS3 must provide more accurate or extensive information than ADIOS2; improved enough to possibly affect cleanup decisions
- ADIOS3 must be modular in form so that it can operate as a stand-alone, through a web browser, or as a component of GNOME2.
- ADIOS3 must meet all the requirements of the Information Quality Act

ADIOS3 structurally will be based upon Lagrangian elements (LE) that represent a geographical segment of the oil and contain details about the oil and other material found within the bounds of the LE. LE's are born, age, may reproduce, and die. A typical LE property would have the following sub-class:

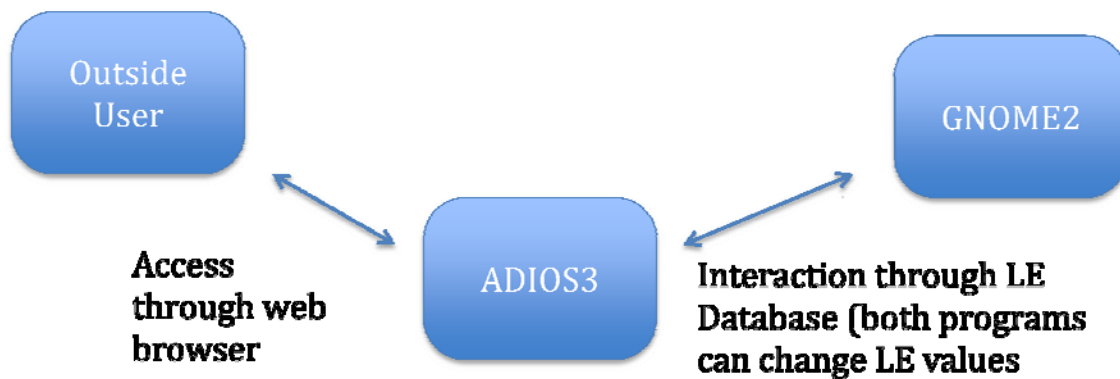
Property

- name
- unit of measure
- value (average, lower, upper)
- generating function (if we use classes, and not just structures)
- lower limit
- upper limit
- status flag

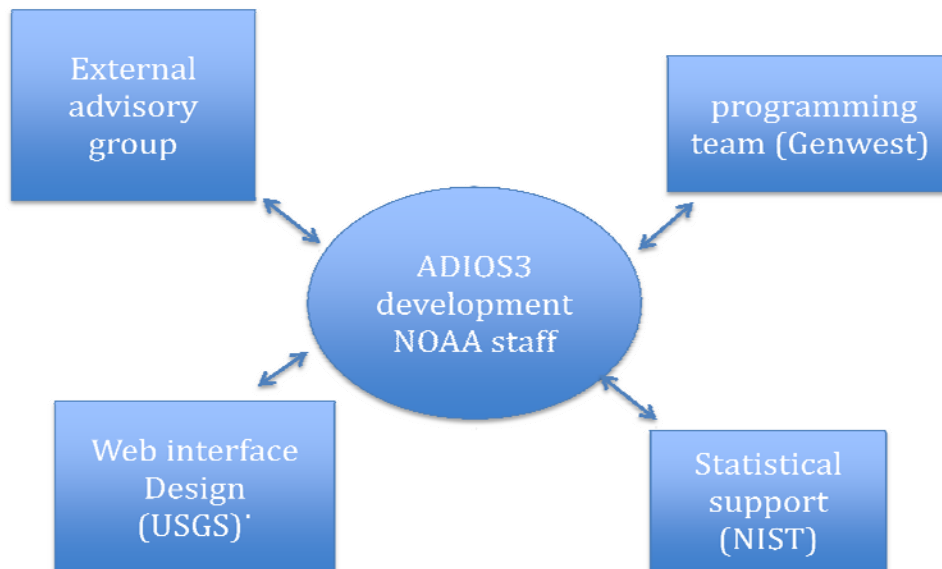
Suggested LE property list include

- number designation
- release time
- age
- vapor pressure (per pseudo-component)
- molar volume (per pseudo-component)
- x, y, z coordinates
- area
- volume
- thickness (surface oil)
- water fraction
- fraction evaporated((per pseudo-component)
- kinematic viscosity
- density
- wind drift factor
- Fay diffusion coefficient
- adhesion
- surface fractional coverage
- oil-water interfacial tension
- sediment load (sub-surface oil)
- droplet size distribution (sub-surface oil)
- emulsion stability
- biodegradability
- floating/beached/bottom determination
- benzene fraction
- PAH fraction
- ingested (yes/no)
- solubility (per pseudo-component)
- toxicity (per pseudo-component)
- gas fraction (subsurface release)

The program will consist of modules that communicate with each other, and with GNOME2, through changing and reading LE values. General users of ADIOS3, however, will not interact with ADIOS3 through Gnome2. Rather, they will run spill scenarios that have no specific geographic location by accessing NOAA servers, where the computational program lives, through a web browser.



Project Snowy Plover (the development of ADIOS3) ideally will produce a viable product by the end of FY 2012. Unfortunately, past experience indicates that software projects fail to meet their deadlines. The project structure is shown below



There will be two general workshops; one at the end of September to bring NOAA staff and the external advisory group together to determine the current technology for best estimating the various weathering modules for ADIOS3. A second workshop will review the alpha version of the software before final quality assurance testing.

Project Snowy Plover, as with the DWH Oil Budget Calculator, will require managing a spatially distributed team. UNH Coastal Response and Research Center (CRRC) will assist in this process. A common project website for background material and project status will be created shortly. Expect numerous conference calls.

Additional research related to this project is being conducted the University of Washington and Environment Canada.

Statement of Work for IAG – USGS

USGS will design and code the web interface for ADIOS3, the next generation of the NOAA oil spill weathering and cleanup assessment tool. This will require developing and testing innovative methods of acquiring and displaying data either input from the user or generated by the model. Work will require development of between 15-25 screens. Code will be documented to meet standards of the Information Quality Act and must interact smoothly with the core computational module developed by NOAA. USGS will also designate a representative to the ADIOS3 external advisory committee.

Statement of Work – NIST

NIST will provide statistical support for ADIOS3, the next generation of the NOAA oil spill weathering and cleanup assessment tool, similar to the statistical work done by NIST in the development of the DWH Oil Budget Calculator. NOAA will provide the NIST expert with time-dependent formulas and expected uncertainty estimates for various weathering and cleanup processes. Using scientifically defensible statistical techniques, NIST will then construct uncertainty estimate bounds for ADIOS3 output variables. For some processes, NIST will have to provide algorithms to construct uncertainty bounds from user-specified uncertainty limits on input variables. NIST will provide written documentation of its methods for inclusion in the ADIOS3 technical report. NIST will also designate a representative to the ADIOS3 external advisory committee.