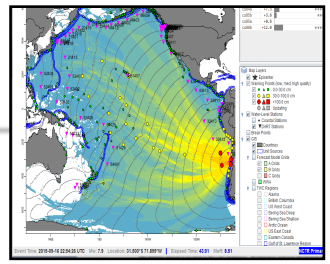
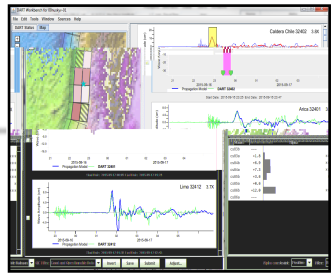
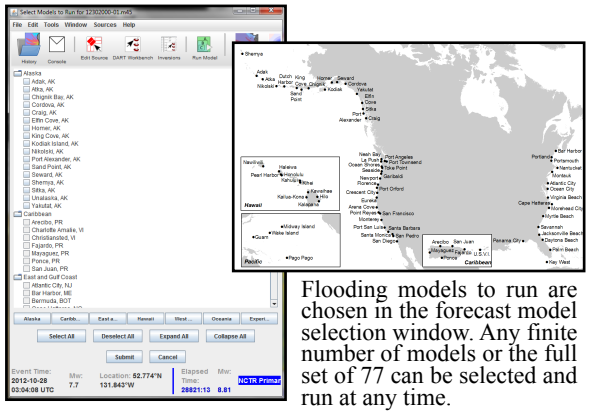
SIFT Workflow

A propagation forecast window is displayed when SIFT detects a tsunami. Propagation of the waves from the earthquake source is shown quickly. The map is automatically updated when a new forecast that matches the tsunami in the deep ocean is determined.



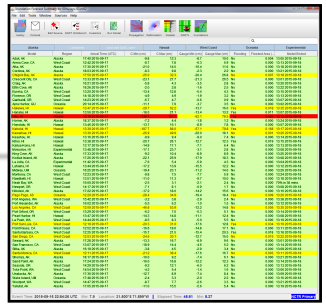
The DART Workbench is the interface used to derive a tsunami source. Model predictions run with placeholder sources and stored in a database are replaced by a source that forces the model to match measured tsunami waves (yellow box). The new source is shown on a map and in a table.





Flooding models to run are chosen in the forecast model selection window. Any finite number of models or the full set of 77 can be selected and run at any time.

Propagation and flooding forecasts are displayed in both tabular and graphical formats at locations pre-defined by NOAA Tsunami Warning Centers.



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Contact

For more information about SIFT, please visit website:

http://nctr.pmel.noaa.gov/tsunami-forecast.html

NOAA Center for Tsunami Research
nctr.pmel.noaa.gov

PMEL
Pacific Marine Environmental Laboratory

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SIFT

Short-term Inundation Forecasting for Tsunamis

Operational Tsunami Forecast System: Combining Real-time Tsunami Measurements with Numerical Models to Forecast Tsunami Wave Arrival, Amplitudes, and Flooding

SIFT Overview

SIFT (Short-term Inundation Forecasting for Tsunamis) was developed by NOAA's Office of Oceanic and Atmospheric Research and National Weather Service to forecast tsunami wave arrival times, amplitudes, and flooding based on tsunami measurements in the deep ocean. Development started with National Tsunami Hazard Mitigation Program funding and was then accelerated under the Emergency Supplemental Appropriations Act of 2005 in response to the December 26, 2004 Indian Ocean tsunami. SIFT has been resident in NOAA's two Tsunami Warning Centers since 2005 when experimental version 1.0 (v1.0) was installed. Following pre-operational testing and parallel code development, SIFT v3.2 was accepted for operational use in December 2013. Dynamic development provides enhancements and features as prioritized by the National Weather Service, which is responsible for NOAA's Tsunami Warning Centers.

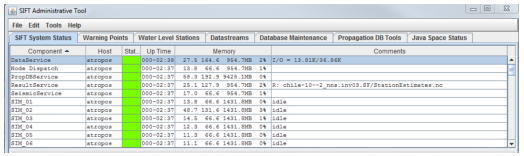
SIFT is composed of a modular set of components and databases that contain a suite of utilities and tools for system administration, configuration, monitoring, operational forecasting, viewing past events, and generating simulations for testing.

System Utilities

SIFT Monitor provides an updated visual display of the status of system components.

File Monitor Services transfers earthquake and water-level data to SIFT.

SIFTAdmin provides the administrator with a way to view the status of individual services.

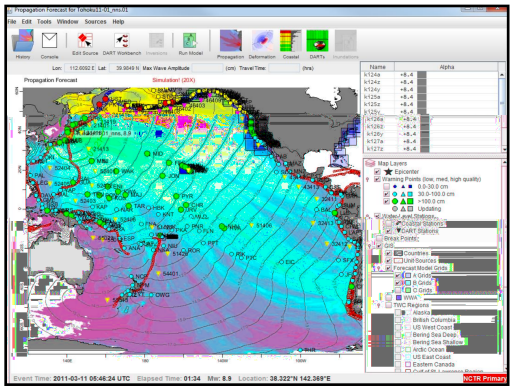


SIFTAdmin tool used by system administrators to set global preferences.

SIFTConfig allows initial installation and configuration of SIFT services on a new machine.

Utilities for Operational Forecasting

SIFTView



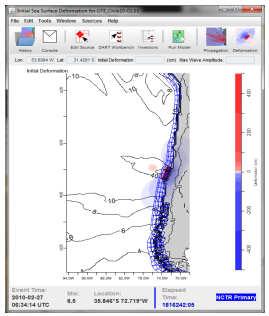
Primary **SIFTView** window, the propagation forecast map. Icons along the top provide access to SIFT utilities and tools.

DART Workbench allows a user to view DART (Deep-ocean Assessment and Reporting of Tsunami) data and select parameters to update a tsunami source.

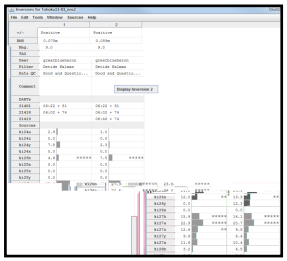
Edit Source allows a user to manually adjust source.

Deformation graphically shows earth deformation.

Inversion provides statistics and information to compare quality of sources derived from fitting model predicted tsunami waves to actual measurements in the deep ocean.



The change in the earth after an earthquake that caused deformation.



Inversion summary window, Inversion is the process used to estimate what is termed the effective tsunami magnitude, a number that is different from earthquake magnitude.

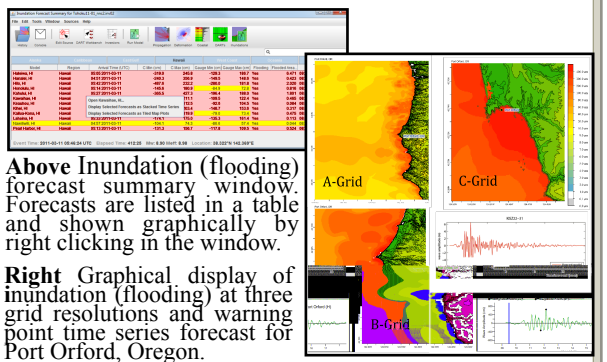
Run Model allows a user to run multiple forecast models in the system to see flooding estimates.

Console displays system messages and errors.

Propagation, Coastal Guidance, and DART Forecasts is the operational forecasting tool that displays and provides access to parameters, water-level data, and forecast model results for each tsunami event. A suite of tools allows a user to start inversions, modify parameters, run one or more coastal flooding models, and analyze results.

Three primary windows display:

1) Propagation forecast - includes a map panel that shows forecast and contours of forecast tsunami arrival time.
2) Coastal guidance - features a table that shows two types of forecast, an initial value based on propagation model results scaled using Green's Law and values from inside any of the three flooding model grids when the model is run.



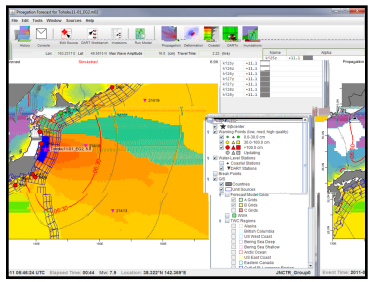
Above Inundation (flooding) forecast summary window. Forecasts are listed in a table and shown graphically by right clicking in the window.

Right Graphical display of inundation (flooding) at three grid resolutions and warning point time series forecast for Port Orford, Oregon.

3) DART forecasts - displays forecasts for the off-shore grid point nearest to the DART system.

History Utilities

Provides access to past, in-progress, or simulated events for viewing or editing to create a custom test event. Past events are shown in a browser window. An optional TestEvent application can be used to create simulated test tsunami events.



Example simulated event window.