

NTHMP Benchmarked tsunami models

Reference: <http://nthmp.tsunami.gov/documents/nthmpWorkshopProcMerged.pdf>

\*NOTE: Information contained within quotes was extracted directly from workshop proceedings. Please refer to this document, referenced above, for answers to specific questions.

1. ALASKA GI-T - Alaska Geophysical Institute Parallel Robust Inundation Modeling Environment-Tectonic  
*Affiliation:* Alaska Geophysical Institute  
*Usage:* “The ALASKA GI-T is a numerical code that simulates propagation and runup of landslide-generated tsunami waves in the framework of the long-wave approximation to water dynamics.”  
*Documentation:* “Limited”  
*Access:* “can be accessed through a wizard-style internet-based interface that guides users through setup, execution, and retrieval of tsunami modeling results.”
2. ATFM – Alaska Tsunami Forecast Model  
*Affiliation:* National Tsunami Warning Center  
*Usage:* “...two horizontal components of velocity (u and v) are depth-averaged. The vertical component of velocity is not considered in this hydrostatic formulation... and the sea level is computed with a second-order accurate, upwind scheme that conserves mass to machine accuracy (van Leer, 1977). The run-up / run-down method is based on the VOF approach...”  
*Documentation:* ‘Limited’
3. FUNWAVE-TVD, v. 1.0 – Fully Nonlinear Boussinesq Wave Model  
*Affiliation:* University of Delaware  
*Usage:* “FUNWAVE-TVD has been used to model landslide or co-seismic tsunamis.”  
*Documentation:* “Yes”
4. GeoClaw  
*Affiliation:* University of Washington  
*Usage:* “For modeling earthquake-generated tsunamis, the co-seismic seafloor motion is modeled by adjusting the bathymetry dynamically each time step... For modeling landslide-generated tsunamis, the seafloor motion is modeled by adjusting the bathymetry dynamically each time step.”  
*Documentation:* Yes -- at <http://www.clawpack.org/geoclaw>  
*Access:* hosted at <https://github.com/organizations/clawpack>.
5. MOST – Method of Splitting Tsunami  
*Affiliation:* NOAA Pacific Marine Environmental Lab; University of Washington Joint Institute for the Study of the Atmosphere and Oceans  
*Usage:* “The MOST model simulates propagation and runup of gravity waves according to depth-integrated non-linear shallow water equations (NSWEs.)...”  
*Documentation:* ‘Limited’
6. NEOWAVE - Non-hydrostatic Evolution of Ocean WAVES  
*Affiliation:* University of Hawaii  
*Usage:* “... model is a shock-capturing, dispersive model in a spherical coordinate system for basin-wide evolution and coastal runup of tsunamis using two-way nested computational grids (Yamazaki et al., 2011). This depth-integrated model describes dispersive waves through the non-hydrostatic pressure and vertical velocity...”  
*Documentation:* “Yes”

7. SELFE - Semi-implicit Eulerian- Lagrangian Finite Elements

*Affiliation:* Oregon Health and Science University

*Usage:* “The tsunami propagation and inundation model SELFE (Zhang and Baptista, 2008a) was envisioned at its inception to be an open source, community supported, 3-D hydrodynamic/hydraulic model.”

*Documentation:* “Yes”

*Access:* <http://www.stccmop.org/CORIE/modeling/selfe/>

8. THETIS

*Affiliation:* University of Rhode Island

*Usage:* “... a multi-fluid Navier-Stokes (NS) solver developed by the TREFLE CNRS laboratory at the University of Bordeaux I. It is a multipurpose CFD code ... and fully parallelized. For tsunami modeling, THETIS has been applied to tsunami generated by subaerial landslides (Abadie et al., 2010)...”

*Documentation:* “Yes”

*Access:* <http://thetis.enscbp.fr>

9. TSUNAMI3D - Tsunami Solution Using Navier-Stokes Algorithm with Multiple Interfaces

*Affiliation:* Texas A&M University at Galveston

*Usage:* “... model is suitable for complex tsunami generation because it has the capability to consider moving or deformable objects, subaerial/subsea landslide sources, soil rheology, and complex vertical or lateral bottom deformation.”

*Documentation:* “Limited”

10. BOSZ - Boussinesq Model for Ocean and Surf Zones

*Affiliation:* University of Hawaii

*Usage:* “BOSZ is primarily used for modeling surf-zone and swash processes of swell and wind waves.”

*Documentation:* ‘Limited’