Grid and cloud computing services for tsunami simulation

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ASGC

TWGrid

Academia Sinica Grid Computing

- COMCOT (Cornell Multi-grid Coupled Tsunami Model) is a tsunami modeling package, capable of simulating the entire lifespan of a tsunami, from its generation, propagation and runup/rundown in coastal regions.
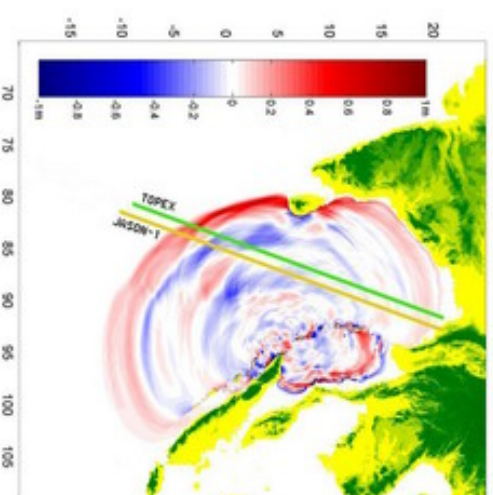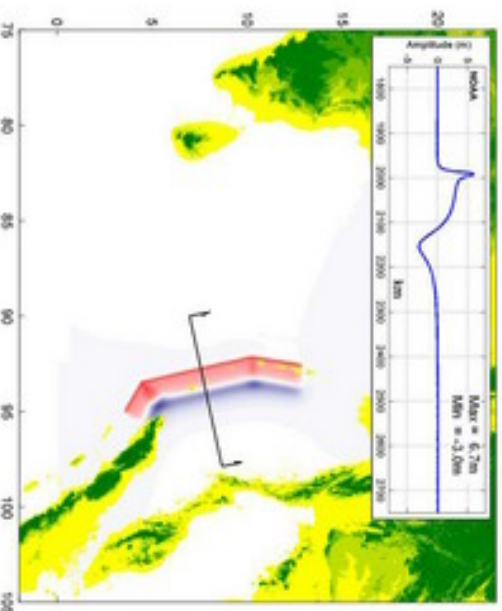
Performance Improvement

- Goal
  - Optimize COMCOT performance and improve the cons of COMCOT

- Optimization method
  - Make memory access consecutive
  - Avoid breaking instruction pipelining
  - Logic simplification
  - Avoid expensive operations
  - Reduce memory allocation

User Interface

- Only need to input parameters for
  - Focal Mechanism
  - Nested Grid
  - Tide station
- No need to upload bathymetry data
  - GEBCO global data
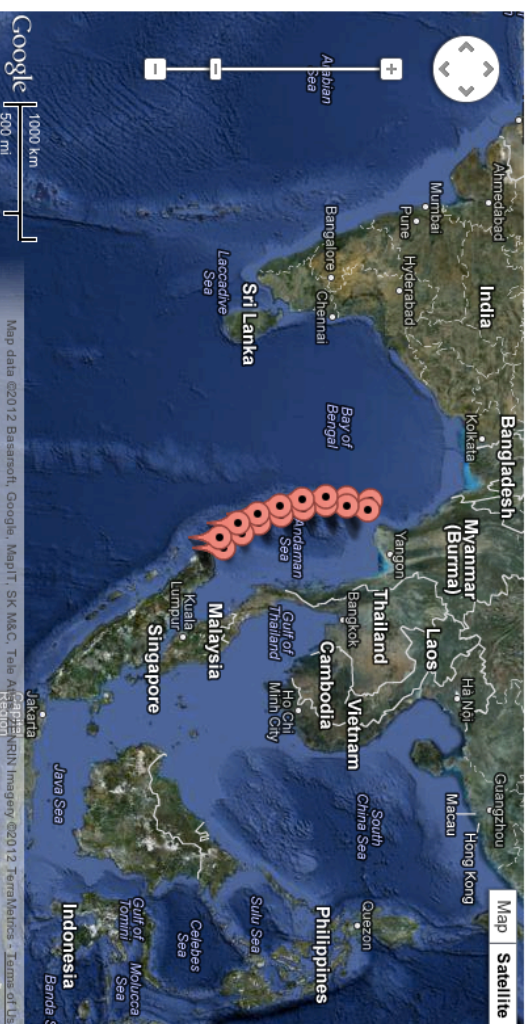 - Resolution: 0.5 minutes

User Interface

ASGC TWGrid   TWGrid

Focal Mechanism settings

View and modify your focal mechanism settings here.

#	Set Name	# of Fault plane	
1	Banda Aceh	16	❯

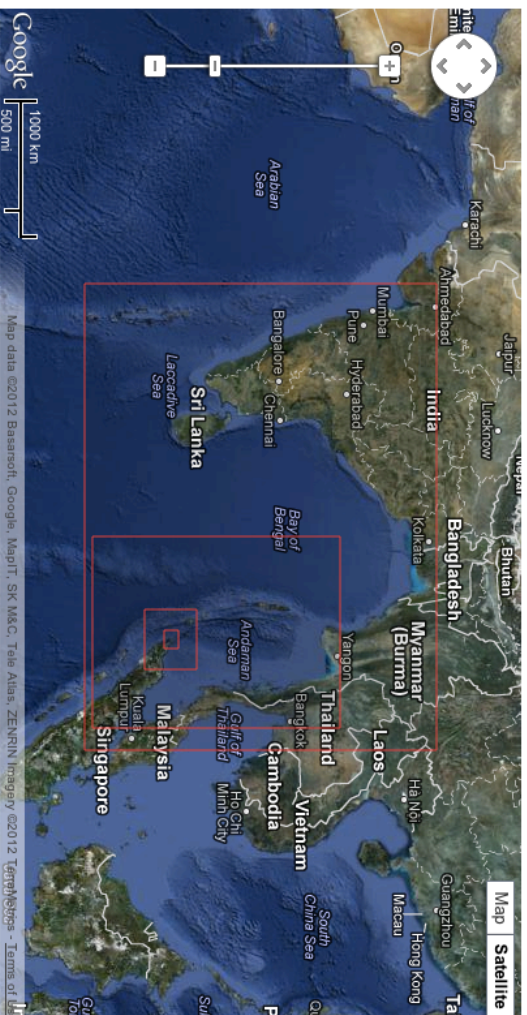| #	Location	Depth (km)	Fault size (L:km / W:km / D:m)	Direction(°)	action
1	3.7658°N 95.7537°E	40	L: 175 (km) W: 35 (km) D: 10 (m)	Strike: 322° Dip: 35° Slip: 90°	✏ 🗒
2	3.4926°N 95.011299°E	15	L: 175 (km) W: 157 (km)	Strike: 322° Dip: 11°	✏ 🗒

User Interface

iCOMCOT Home About **Simulation ▼** Status Contact 👤 john Logout

Grid settings
View and modify your nested-grid settings here.

#	Set Name	# of Sub-grids	
☐ 1	Taiwan1	4	❮
☑ 2	Banda Aceh	4	❮

#	latitude	longitude	grid size	action
1	0°N - 23.1°N	71°E - 102.5°E	3'9"	✎ 🗑
2	0.56°N - 16.975°N	88.0449998°E - 100.942497°E	1'3"	✎ 🗑

User Interface

TWGrid

Tidestation settings

View and modify your tidestation settings here.
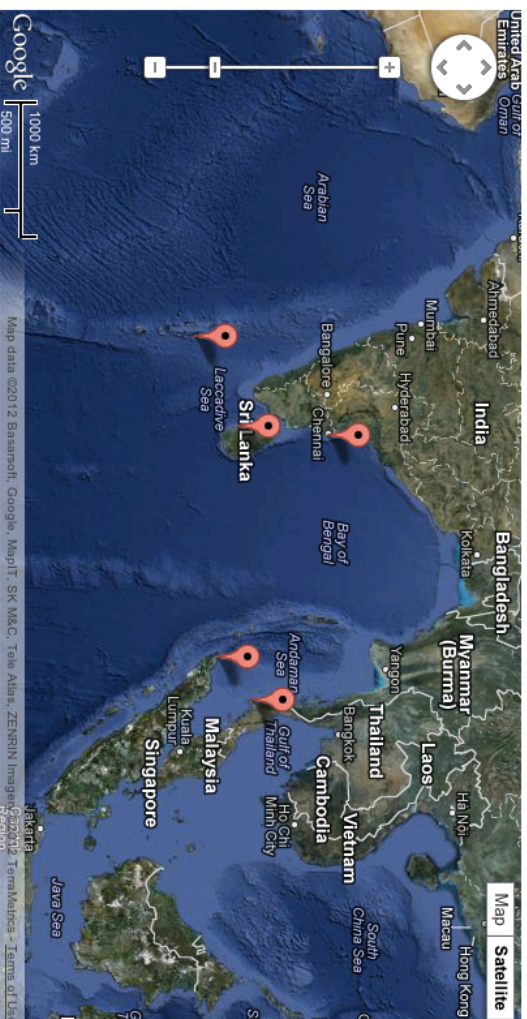
#	Set Name	# of Tidestations	action
1	TW-TS-ALL	41	✏ 🖶 ‹
2	Banda Aceh	5	✏ 🖶 ›

#	Name	Location	action
1	Banda_Aceh	5.5833°N 95.300003°E	✏ 🖶
2	Phuket	8°N 98.199997°E	✏ 🖶

User Interface

TWGrid

INITIAL SURFACE
initial surface

MAXIMUM WAVE HEIGHT
layer01

TIDE STATIONS
maximum wave height
01_BandaAceh
02_Phuket
03_Chennai
04_Male
05_Colombo

WAVE PROPAGATION
layer01 (400x300)
layer01 (640x480)
layer01 (800x600)

BATHYMETRY
layer01

DOWNLOAD
Google Earth KMZ

Initial Free-Surface Elevation

Latitude (N)

Longitude (E)

-6 -4 -2 0 2 4 6
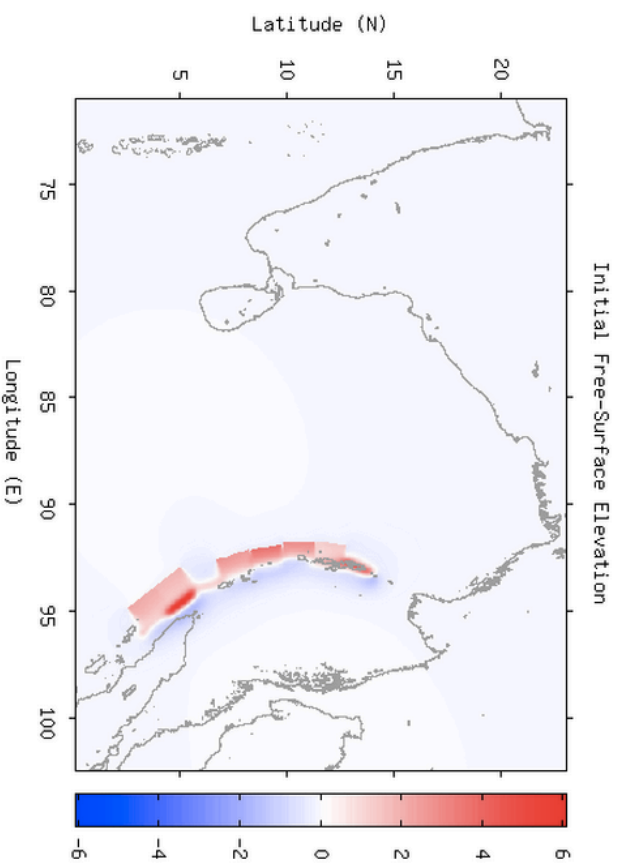
User Interface

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Status

In this page, user can view the status of running simulation, retreive simulation result, and view the running history.

#	Simulation Name	Status	Start Time	Elapsed Time	Action		
1	test 1g 1h	DONE	Thu Oct 11 2012 00:26:54 GMT+0800 (CST)	0:38:02	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
2	test t2 1g 5h	DONE	Thu Oct 11 2012 00:26:26 GMT+0800 (CST)	0:32:36	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
3	test t5 1g 5h	DONE	Thu Oct 11 2012 00:12:15 GMT+0800 (CST)	0:38:43	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
4	test t4 1g 5h	DONE	Thu Oct 11 2012 00:11:45 GMT+0800 (CST)	0:31:47	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
5	test t3 1g 5h	DONE	Thu Oct 11 2012 00:11:15 GMT+0800 (CST)	0:24:37	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
6	test t2 1g 5h	DONE	Thu Oct 11 2012 00:10:45 GMT+0800 (CST)	0:12:33	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
7	test 1g 1h	DONE	Thu Oct 11 2012 00:10:10 GMT+0800 (CST)	0:05:22	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
8	test 1g 1h	DONE	Wed Oct 10 2012 23:55:17 GMT+0800 (CST)	0:05:09	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
9	test 1g 1h	DONE	Wed Oct 10 2012 23:21:45 GMT+0800 (CST)	0:05:34	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result
10	test 1g 1h	DONE	Wed Oct 10 2012 23:01:21 GMT+0800 (CST)	0:06:36	⊞ View Detail	▮ View Log	⬈ View Result	⬇ Download Result

User Interface

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Status

In this page, user can view the status of running simulation, retreive simulation result, and view the running history.

#	Simulation Name	Status	Start Time	Elapsed Time	Action			
1	test 1g 5h	10% 1910 / 18000 sec	Fri Oct 12 2012 13:57:06 GMT+0800 (CST)	0:31:57	ⅲ View Detail	🗎 View Log		
2	test 1g 1h	DONE	Thu Oct 11 2012 00:26:54 GMT+0800 (CST)	0:38:02	ⅲ View Detail	🗎 View Log	🖼 View Result	⬇ Download Result
3	test t2 1g 5h	DONE	Thu Oct 11 2012 00:26:26 GMT+0800 (CST)	0:32:36	ⅲ View Detail	🗎 View Log	🖼 View Result	⬇ Download Result

User Interface