A few slides illustrating Adaptive Mesh Refinement with GeoClaw

For documentation, downloads, research papers:

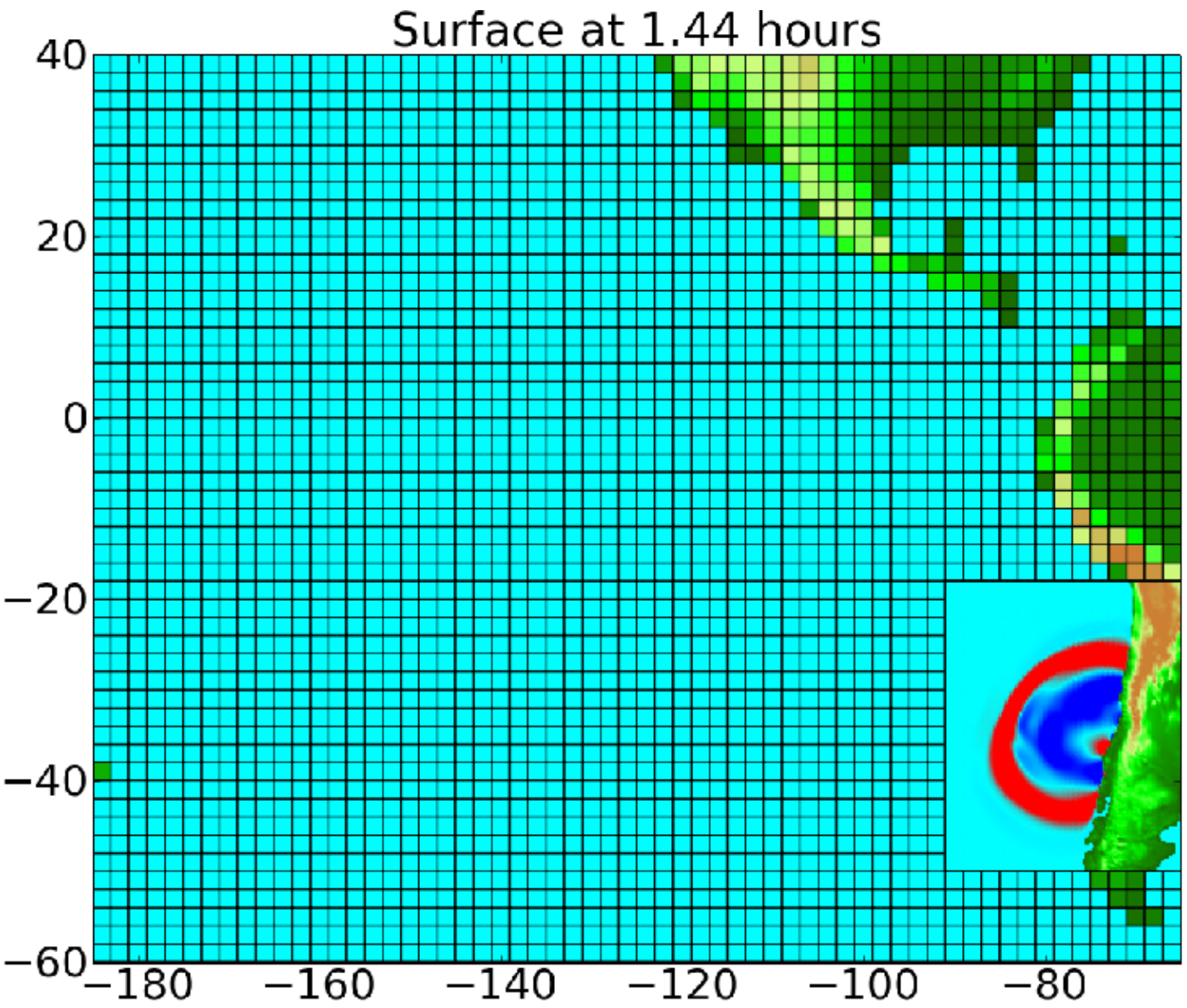
www.clawpack.org/geoclaw

On these slides grid lines are shown only on the coarsest level.

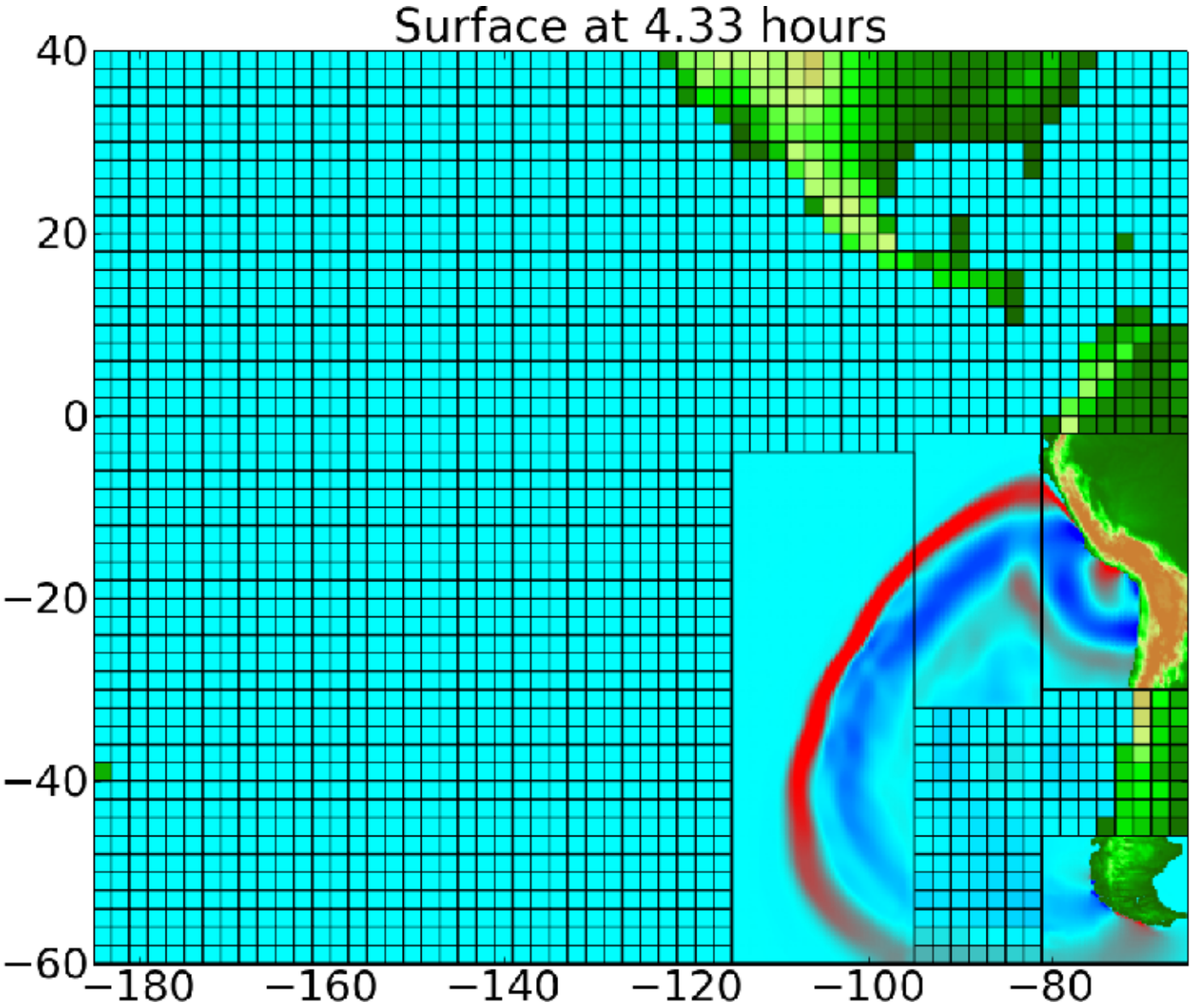
Refinement is done on rectangular patches.

5 levels of refinement to go from Ocean scale to Hilo Harbor (with total refinement factor $2^{14} = 16,384$ in each direction).

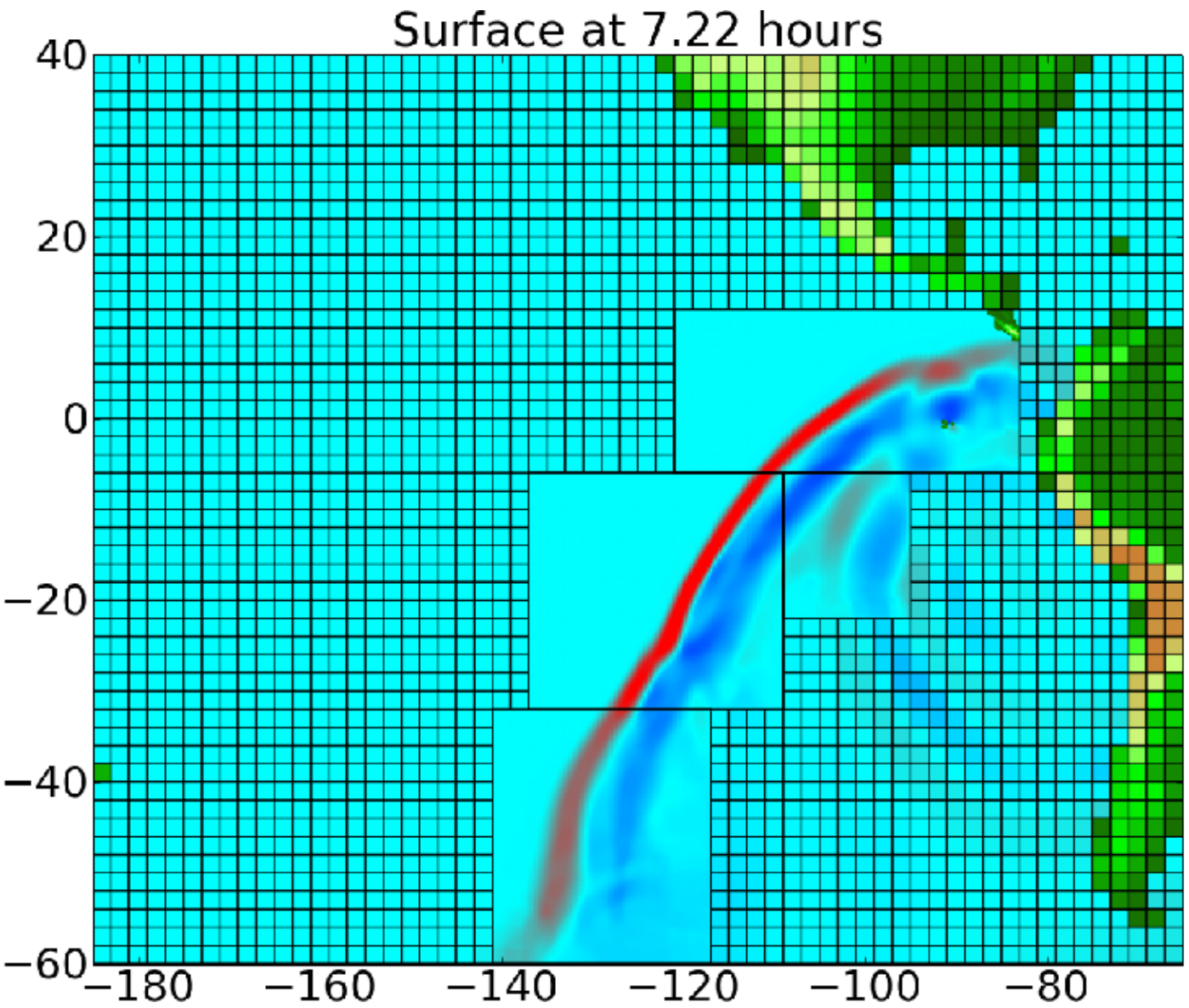
27 February 2010 tsunami



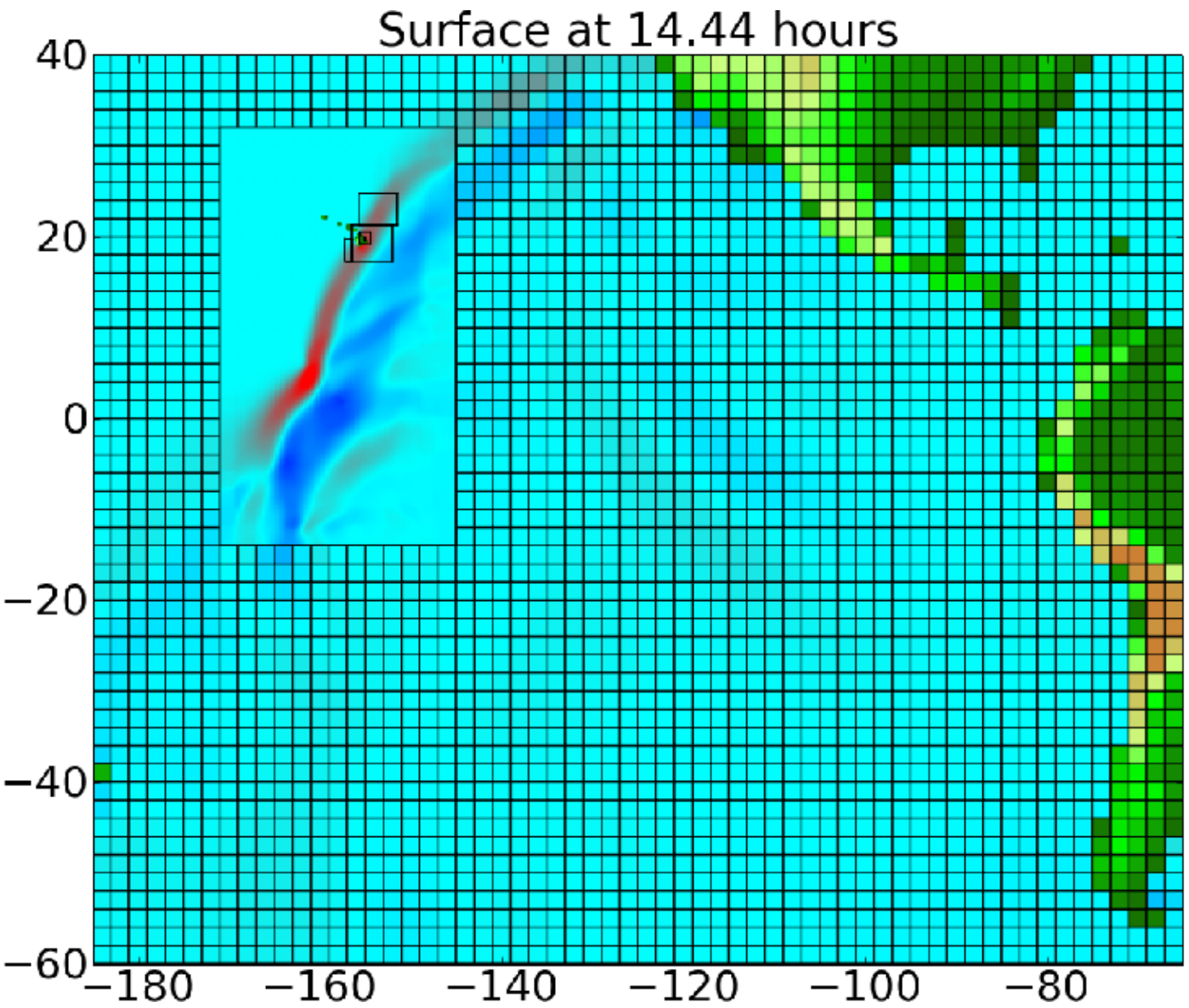
27 February 2010 tsunami



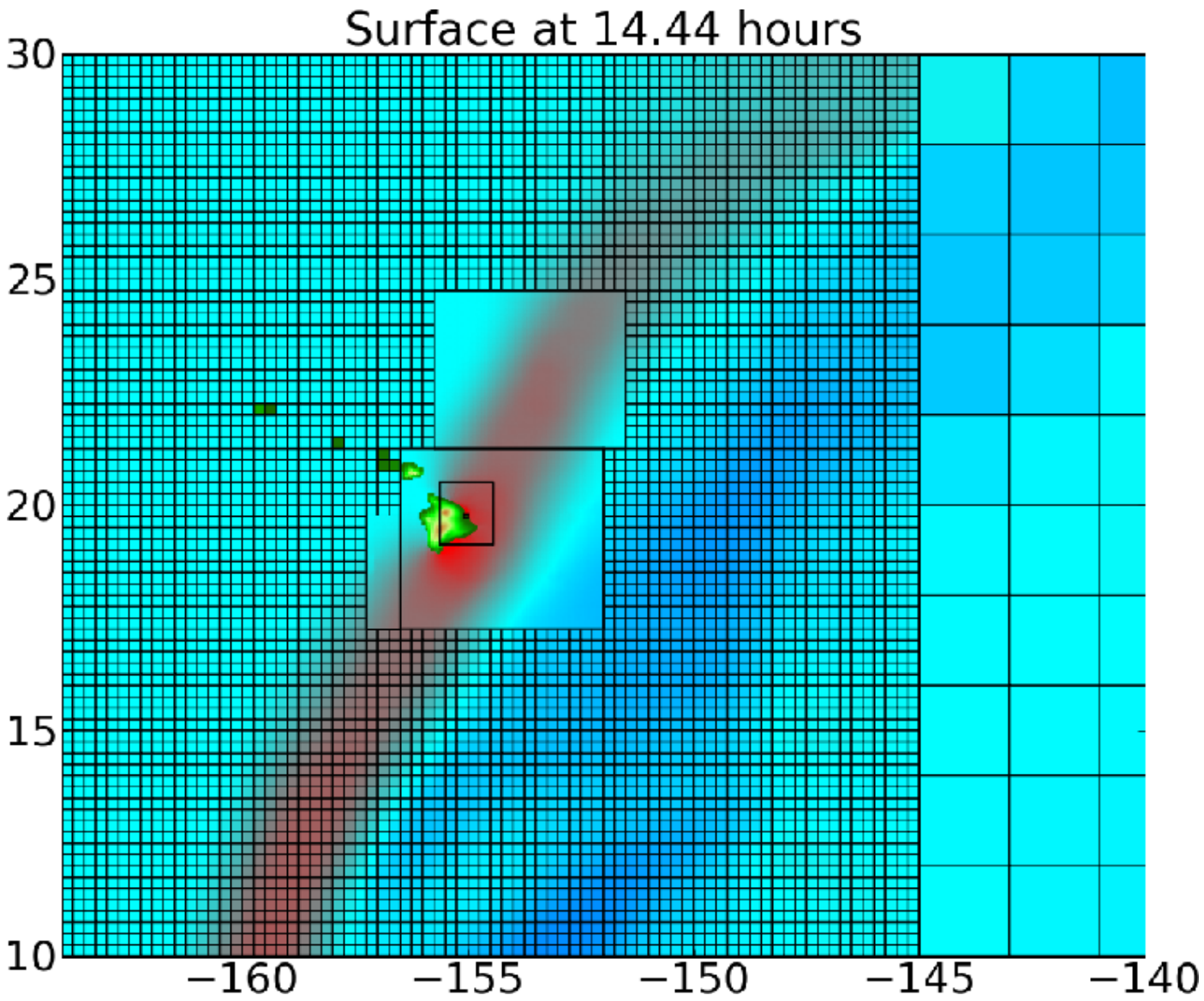
27 February 2010 tsunami



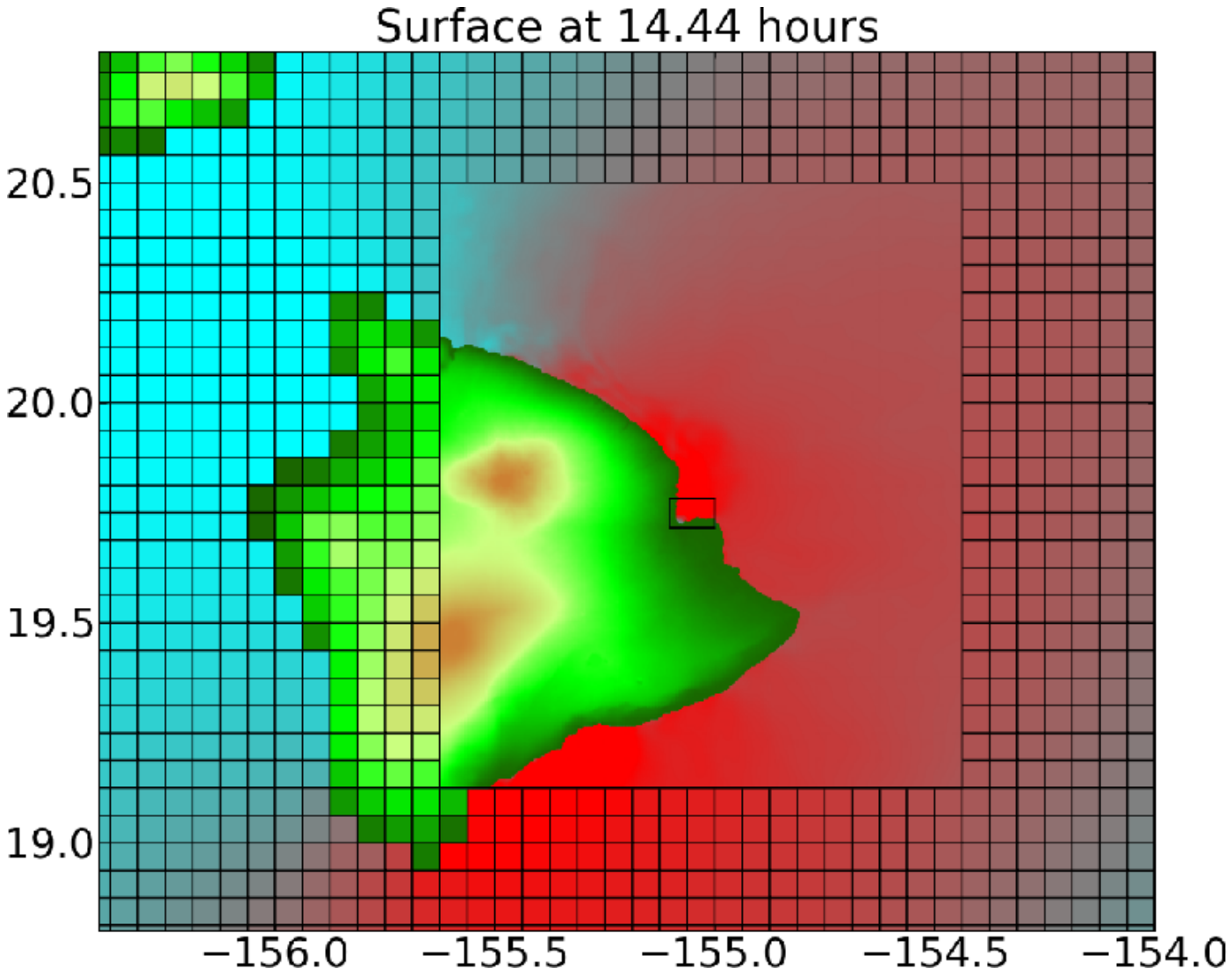
27 February 2010 tsunami



27 February 2010 tsunami



27 February 2010 tsunami



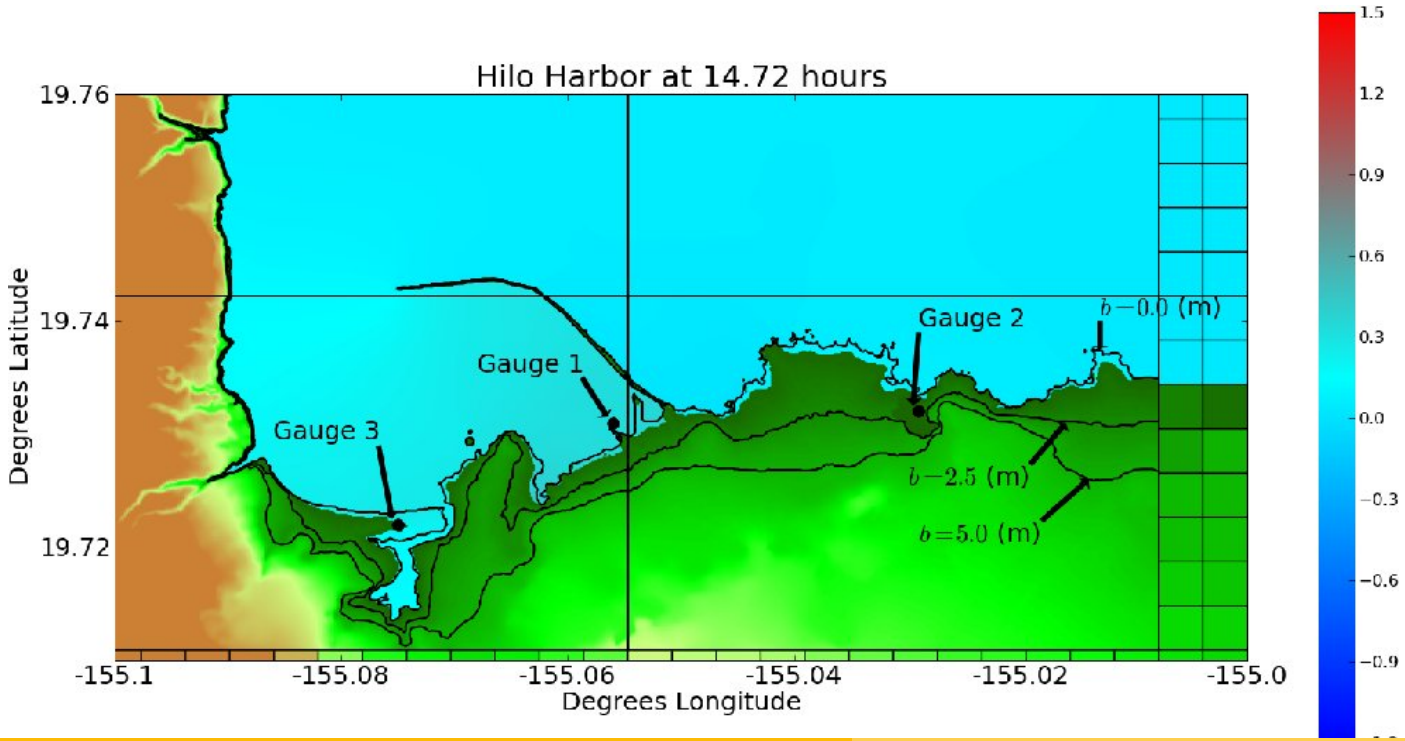
Inundation of Hilo, Hawaii

Using 5 levels of refinement with ratios 8, 4, 16, 32.

Resolution ≈ 160 km on Level 1 and ≈ 10m on Level 5.

Total refinement factor: $2^{14} = 16,384$ in each direction.

With 15 m displacement at fault:



Inundation of Hilo, Hawaii

Using 5 levels of refinement with ratios 8, 4, 16, 32.

Resolution ≈ 160 km on Level 1 and ≈ 10m on Level 5.

Total refinement factor: $2^{14} = 16,384$ in each direction.

With 90 m displacement at fault: