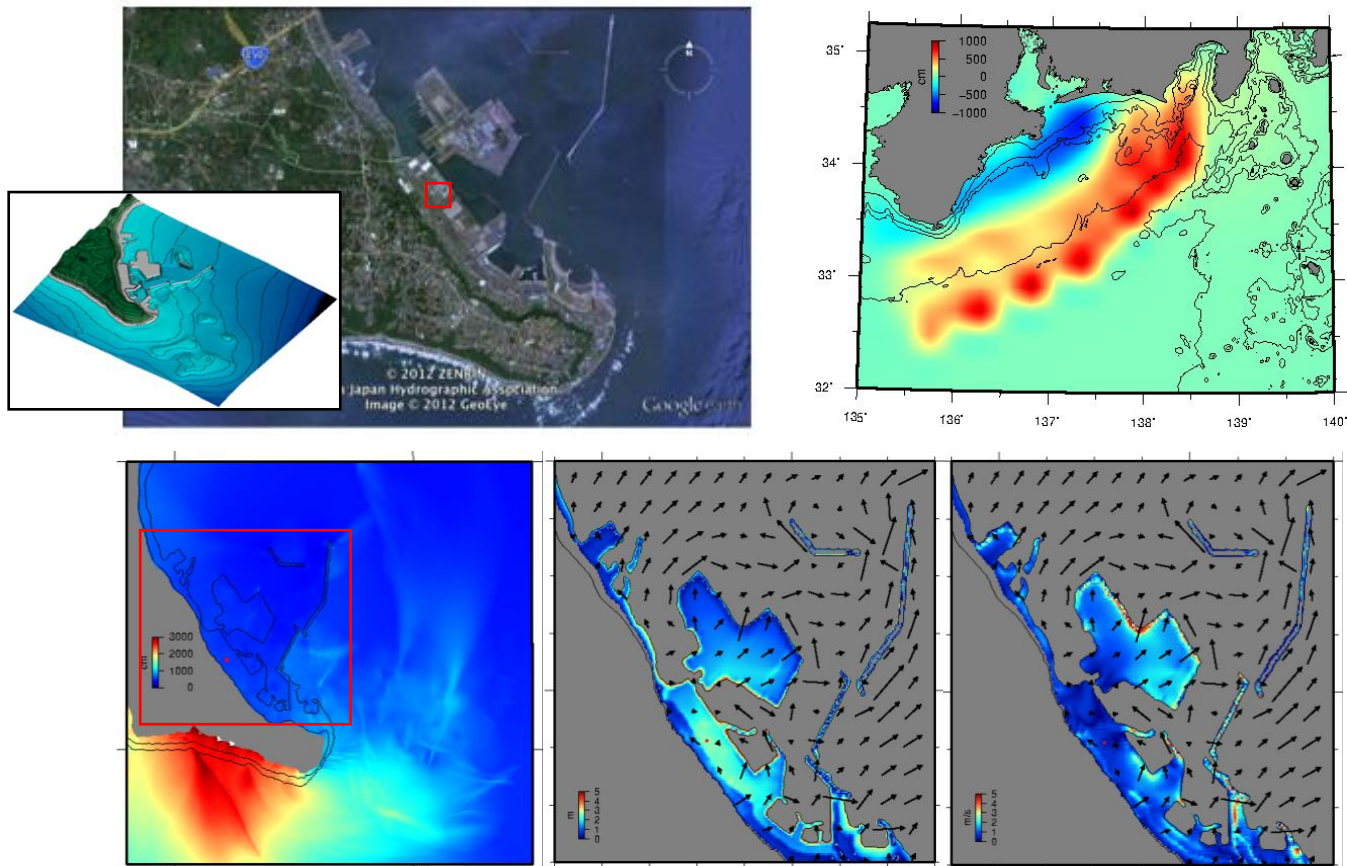


TSUNAMI INUNDATION MODELLING OMAEZAKI PORT, JAPAN

OMAEZAKI, JAPAN



(top left) Omaezaki Port and (inset) 3-d model. (top right) Sea floor deformation from a hypothetical M 9.0 earthquake. (bottom row left to right) Maximum computed tsunami height and closeups of overland flow depths and flow speed. Black vectors show offshore tsunami current speed and direction.

PROJECT INFORMATION:

Location: Omaezaki, Japan
Client: Chevron Corporation
Project Date: 2012

SCOPE OF WORK:

- Review of historical tsunami events
- Tsunami source characterization
- High resolution numerical modelling of tsunami inundation and currents
- Multi-scenario sensitivity testing

PROJECT DESCRIPTION:

ORCAS Director Jose Borrero was engaged by Chevron Corporation to conduct a detailed numerical modelling study of tsunami inundation effects at a facility in Omaezaki Port with the goal of determining design parameters for the construction of a tsunami evacuation structure there.

After conducting an in-depth review of the tsunami history of the area using available catalogues and databases, eCoast embarked on a detailed numerical modelling study. A detailed, high resolution 3-d bathymetric model was set up in the ComMIT tsunami modelling system. A range of hypothetical earthquake generated tsunami scenarios were trialled with tsunami sources based on uniform and variable slip distributions. Simulations were run over two different models: one with a 5 m protective 'tsunami wall' and another without. The model output was analysed to determine critical quantities such as total tsunami height, overland flow depths and flow speed and momentum flux. The results showed that the tsunami barrier could be effective for tsunami heights up to the height of the barrier (approx. 5 m above ground level) however there was the possibility of flooding coming around the side of the barrier where the barrier joined up with a coastal highway.