QUAKERECNANKAI

Paleotsunami and earthquake records of ruptures along the Nankai Trough, offshore South-Central Japan

DURATION
01/10/2013 - 31/12/2017

BUDGET
1.009.336 €

PROJECT DESCRIPTION

Context
The east coast of Japan is prone to tsunamigenic megathrust earthquakes, as tragically demonstrated on 11 March 2011 by the Tohoku-oki earthquake (magnitude 9.0) and tsunami. The Nankai-Suraga Trough subduction zone, to the southwest of the area affected by the Tohoku-oki disaster and facing the densely populated and heavily industrialized eastern coastline of Central and West Japan, is expected to generate another megathrust earthquake and tsunami in the near future. Historical data, covering the past ca. 1300 yrs, provide some information about the recurrence rate of the earthquakes and resulting tsunami in this region and reveal a mean recurrence interval of 90-200 yrs. Unfortunately, these data still do not extend far enough in time to provide statistically relevant information necessary for adequate hazard and risk assessments. Moreover, the Nankai-Suraga Trough subduction zone is segmented and is characterized by a variable rupture mode, involving single- as well as multi-segment ruptures, which has immediate implications for their tsunamogenic potential.

General objectives and underlying research questions
The main goal of the QuakeRecNankai project is to generate a longer time series of tsunami and megathrust earthquake recurrences, in order to gain a better understanding of the complex recurrence patterns, both in space and in time. To this end, the QuakeRecNankai project will investigate the geological record of:
- paleotsunamis in the coastal region around Lake Hamana and in Lake Hamana itself,
- paleo-earthquakes, using suitable lakes from further inland locations (e.g. selected lakes in the Mount Fuji area).

Methodology
The QuakeRecNankai project will combine i) extensive geophysical, geological and geomorphological fieldwork, in the coastal plain areas and on the lakes (i.e. Hamana lake and the Fuji lakes), ii) advanced sedimentological and geochemical analyses, iii) innovative dating techniques, iv) tsunami inundation modelling, and v) risk and hazard assessment, combined with government policy support and public outreach.

Nature of the interdisciplinarity
The QuakeRecNankai project unites a consortium of already collaborating international experts, including three Belgian teams with expertise in paleotsunami, paleoseismological and coastal research, two Japanese teams with expertise in paleotsunami and limnogeological research, and one German team with expertise in tsunami deposit dating.

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Potential impact of the research on science, society and/or on decision-making
QuakeRecNankai results will be disseminated within the scientific community by means of:
- presentations at national and international scientific workshops, meetings and conferences;
- organization of thematic sessions and field meetings at international conferences;
- organization of a Workshop at the end of the project;
- publications in international peer-reviewed scientific journals.

QuakerecNankai will stimulate capacity building by training European and Japanese PhD and MSc students in the field of tsunami sedimentology and/or paleoseismology.

QuakeRecNankai results will be included in science outreach projects towards the broader public (e.g. stages for university and high-school students, workshop for children…)

QuakeRecNankai will valorize the research results among stakeholders, such as policy makers, by involving them in the Follow-Up Committee and through Annual Progress Reports, by communication of relevant results via the project website, etc.

Description of finished products of research (model, scenario, report, workshop, publication, etc…) at short and medium term.
The QuakeRecNankai project is a "new-data-gathering" project par excellence, as new field data are urgently needed to produce reliable and long enough time series of earthquake and tsunami recurrence and to provide statistically relevant information necessary for adequate hazard and risk assessments along the studied portion of the subduction zone.
Several types of data will be collected (on the field) or generated (in the laboratory, by analyzing the field data). These data will be used and integrated by the project partners to produce the following research results:
- Numerical models of tsunami inundation
- Tsunami hazard maps and scenarios
- Time series of paleotsunami occurrences in the Hamana lake region
- Time series of earthquake-induced event deposits in the Fuji Five lakes
- Combined earthquake/tsunami recurrence model for the northern part of the Nankai-Suraga Trough subduction zone
- Risk analyses and scenarios
- Journal publications
- PhD and MSc theses
- Workshop for children at RBINS
- Final Project Workshop
- Project website

CONTACT INFORMATION

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LINKS

http://quakerecnankai.blogspot.be/

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