## Workshop Chairman

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| Prof. Fumihiko IMAMURA | Director, IRIDeS (International Research Institute of Disaster Science), Tohoku University |

## Co-chairman

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|---|---|
| Prof. Jean-Yves CAVAILLE | Materials, Engineering and Science (MATEIS), INSA-Lyon & Engineering Science Lyon Tohoku joint laboratory (ELyT lab) |
| Prof. Tetsuo SHOJI | Frontier Research Initiative, New Industry Creation Hatchery Center, Tohoku University |

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| Ms. Catherine SAVEY | Manager of the foundation Terre d'Initiatives Solidaires, and Manager of the local authorities projects, lyonnaise des eaux |
| Prof. Tetsuo SHOJI | Frontier Research Initiative, New Industry Creation Hatchery Center, Tohoku University |
| Prof. Toshiyuki TAKAGI | Co-director of ELyT lab, Institute of Fluid Science, Tohoku University |

## Local Organizing Committee

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| Prof. Bernard CHOCAT | GRAIE, INSA-Lyon |
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| Prof. Nicolas RIVIERE | Fluid Mechanics and Acoutics, INSA-Lyon |
| Ms. Catherine SAVEY | Manager of the foundation Terre d'Initiatives Solidaires, and Manager of the local authorities projects, lyonnaise des eaux |

URL | http://www.fri.niche.tohoku.ac.jp/tsunami_workshop/ (updating soon)

## Contacts


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Language: English

# International Innovation Workshop on
# Tsunami, Snow Avalanche and Flash Flood Energy Dissipation

**Schedule**
October 20 & 21, 2014

**Location**
The Majestic Congress Center, Chamonix, France

## Topics

- **Risks and Society** — Philosophical point of view
- **Detection & Alert**
  - Real time monitoring
  - Exchange the observed data
  - Warning & Alert System
- **Hydrodynamics and Mitigation devices**
  - Fluid Dynamics of Tsunami and Energy analysis at Off Shore
  - Structures and Materials for Tsunami Energy Dissipation
  - Mega Float and Material
  - Multi-Purpose Structures
  - Snow Avalanche dynamics and interaction with structures for Energy dissipation
  - Flash floods dynamics and interaction with structures for Energy dissipation
- **Crisis Management** — Distribution networks, etc.
- **Reconstruction of damaged areas**

Jointly organized by
Tohoku University, University of Lyon, IRIDeS (International Research Institute of Disaster Science),INSA de Lyon, ELyT Laboratory, Rhone-Alpes Region, Chamonix City Hall, Science Council of Japan, UNESCO, Lyonnaise des Eaux Company and Japan Society of Maintenology Tohoku/Hokkaido branch

# Background

As one of the most serious natural disaster is Tsunami as can be seen in Fig.1
Tens of thousands of people have been losing their lives periodically.

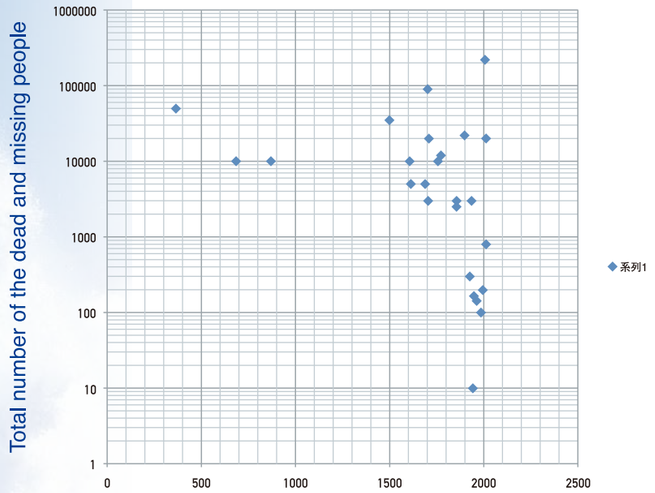
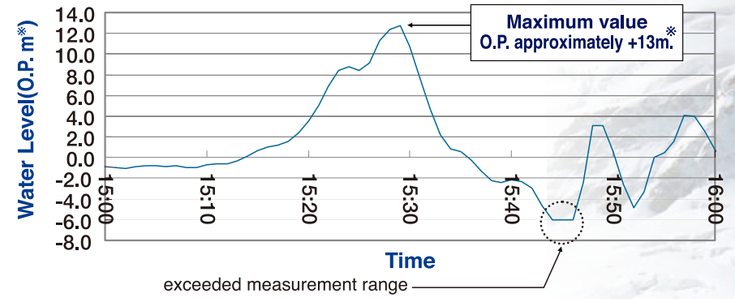



Figure 1 Total number of the Dead and Missing People in the last several centuries
The figure was made based upon the data in Wikipedia by TS

Current countermeasure such as global Tsunami Warning system plays more important role in future. Also we may consider more active action to mitigate Tsunami damage to minimize such a periodic tragedy by Science, Technology and Innovation.

## Records of Observations of Tsunami

Record of tide level of Onagawa on March 11, 2011




**The height of Tsunami which was observed by tidegauge was O.P. approximately +13m.※**

※ O.P.(reference plane of Onagawa: Tokyo bay average sea-surface -0.74m.)
Diastrophism (approximately -1m: prompt report value) around Onagawa Nuclear Power Station which was announced by the Geographical Survey Institute after the Earthquake was considered.

Press Release by Tohoku Electric Power Co., on April 7th, 2011
"Tohoku Pacific Earthquake observation records and research results on Tsunami at Onagawa nuclear power station"

# Objectives

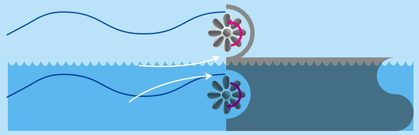
*After the previous Tsunami Energy Dissipation Workshop, hold in 2012 at the Tohoku University, Sendai, Japan, we propose a 2nd edition enlarged to topics such as the risks related to snow avalanches and flash floods. On the other hand, new topics such as philosophical approach of the relationships between natural risks and society, some aspects of crisis management and reconstruction after a disaster have been added.*

# International Innovation Workshop on Tsunami, Snow Avalanche and Flash Flood Energy Dissipation

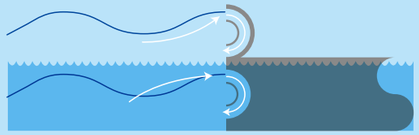
## Energy dissipation mechanisms

***by** pressure drop by friction loss through pore or small channel*
*Flow directional change and wave interaction (overhang shape, rotary vane, etc)*

***by** materials design such as shape memory alloys, metal forms, super-elastic etc*



Floating wave reflection



Wave flatting float※2

Wave control course rope for swimming pool

※2:Photo from "National Research Institute of Fisheries Engineering, Fisheries Research Agency" HP

***by** structural design such as fluid flow energy dissipation by turbulence, flow direction change*

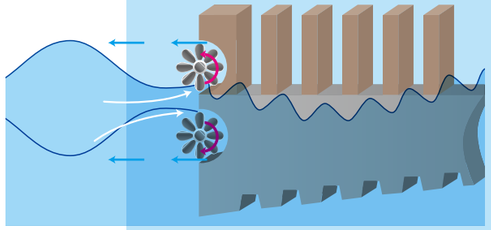
***Possible shapes, as examples***

(a) Flow direction change by rotatable turbine or by the shape

(b) Flow energy dissipation by obstacles designed for the maximum energy dissipation

(c) Large floating structure to prevent wave motion

(d) Combination above



Possible mechanism of energy dissipation and wave reflection