

Avoid Overestimating Evacuation Sites, Head to Higher Ground

Iwate Nippo Proposals: "Five-Year Oath to Protect Lives"

Iwate Nippo Co., publisher of The Iwate Nippo daily, has re-enacted both in paper and digital media the behavior patterns of victims of the 2011 Great East Japan Earthquake from the onset of the earthquake to the engulfment by tsunami in Iwate Prefecture. The project has been conducted jointly with the laboratory of Hidenori Watanabe, associate professor of information architecture, art engineering and design at Tokyo Metropolitan University.

On the occasion of the March 11 fifth anniversary of the disaster, Iwate Nippo re-interviewed the bereaved family members of victims and analyzed on a map the behaviors of 1,326 people who have died or remain missing in the northern Japan prefecture. The interviewed people were all those who had cooperated for the newspaper's "Will Never Forget" special remembrance series carried after the disaster.

The behavior record map highlighted such acts as many people heading to low-ground evacuation sites and more than half (54.9%) of the victims remaining at home.

Given the lessons left by the victims, Iwate Nippo has drawn up a set of "Five-Year Oath to Protect Lives" proposals led by a recommendation to "avoid overestimating evacuation sites and head to higher ground."

Victims' Behavior Patterns Re-enacted on Map More Than Half Remained at Home

The "oath" comprises five proposals: just escape and avoid returning once escaped, avoid overestimating evacuation sites and head to higher ground, conduct survival-oriented evacuation training, "tsunami will not come up to here" does not hold, and create rules to save disaster-vulnerable people.

The behavior records involved analysis of 2,135 victims, and movements of 1,326 victims, whose whereabouts when the earthquake and tsunami struck became known, are re-enacted on a map. Of them, 687 victims (296 male and 391 female) are identified by real names as Iwate Nippo has received permissions from their bereaved families to do so.

The map sheds light on the movements of people evacuating to low ground in various places.

In the city of Rikuzentakata where the worst total of 1,761 people have died or remain missing, the behavior record map shows the situation of people gathering at a public gymnasium in the town of Takata and other designated evacuation sites which are located 2-3 meters above sea level. Evacuees fled not only from the sea direction but also from the mountain side, thus leading many people to fall victim to the massive tsunami.

In the town of Unosumai, Kamaishi city, people gathered at the area's (low-ground) disaster prevention center, which was not a designated evacuation site, partly because it was regularly used for evacuation training.

Many people did not move from their homes as in the town of Ofunato, Ofunato city, where residents' memory of tsunami from the Chile earthquake in 1960 led them to judge that "tsunami will not come up to here." In the Taro district of Miyako city, the map shows people tending to stay at home without evacuating in an area inside of the coastal levee.

The mapped victims at home reached 63.7% when the earthquake struck and 54.9% when the tsunami hit, underscoring how many people remained at home. Notable were residents of elderly facilities, vulnerable people in need of assistance for evacuation and other people who were not able to move.

Of the victims, those who evacuated immediately after the earthquake struck were only 11.1%, those who did so after a while of some activities stood at 27.3%, and those who remained at home, work or other places without escaping came to 29.3%. The figures underline that evacuating immediately is the major premise to protect lives.

Watanabe, who assumed the post of visiting scholar at Harvard University in April, plans to utilize the behavior record map in disaster archives of the university.

Significance in Grasping Detailed Situations

Comments by Fumihiko Imamura, Director of the International Research Institute of Disaster Science at Tohoku University (Professor of Tsunami Engineering)

There is no past case of such large-scale and detailed research of people who have died of tsunami. The significance of objectively looking into behavior patterns on an area-by-area basis is extremely great. In the past, information of tsunami damage involved only that of people who have survived, and those of victims' behavior patterns and situations were fragmentary.

Lessons will be left by making clear the situations of how victims have been affected. Overall, I believe that disaster-stricken people divide into two groups -- those who stayed and those who moved but were affected. It was surprising that many people remained at places with a high level of awareness against tsunami. Conceivable factors are that people have forgotten the past experiences and lessons, new generations have arisen, and new families have moved in.

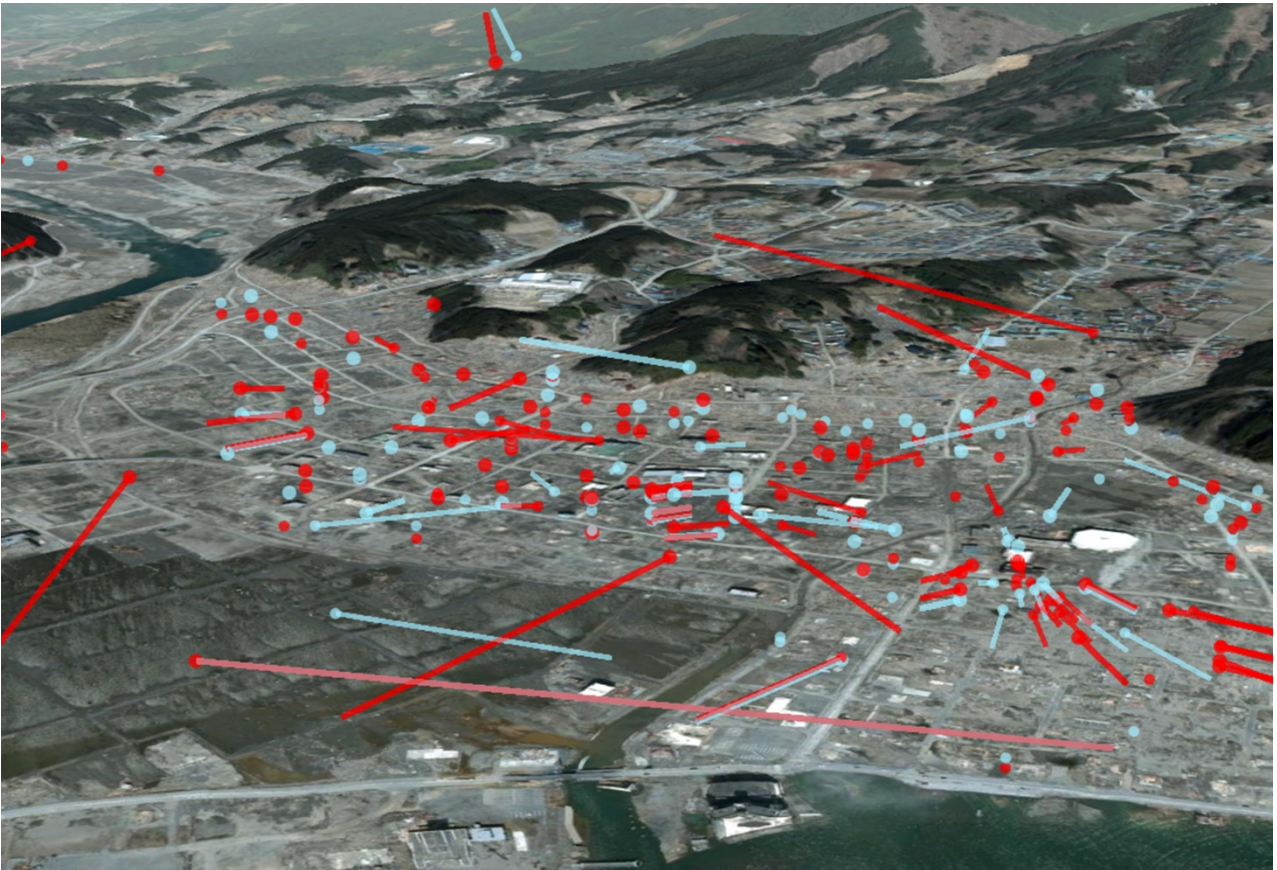
The research made clear the importance of taking actions against tsunami.

Research Method

Reporters of Iwate Nippo met directly or sent postal mail to interview those bereaved family members who had cooperated for the "Will Never Forget" series aimed at recording the proof of lives of the disaster victims. Responses were received from 1,549 surviving family members between November 6 last year and January 30 this year, and a total of 2,135 victims were analyzed. Evacuation behavior patterns were re-enacted for 1,326 victims whose whereabouts when the earthquake struck and tsunami hit became known. The behavior record map uses an aerial map of the Geospatial Information Authority of Japan. There are 5,796 people who have died or remain missing in Iwate Prefecture. The "Will Never Forget" series covered 3,428 victims.

"Five-Year Oath to Protect Lives"

- Just escape and avoid returning once escaped
- Avoid overestimating evacuation sites and head to higher ground
- Conduct survival-oriented evacuation training
- "Tsunami will not come up to here" does not hold
- Create rules to save disaster-vulnerable people.



Behavior record map of victims in downtown area of Rikuzentakata when Great East Japan Earthquake occurred (blue is male, red is female)