



## WHEN SECONDS MEAN LIVES - AN INSIDE VIEW OF LAST WEEK'S TSUNAMI ALERT EFFORTS

### The Pacific Tsunami Warning Center's director shares an inside view of alert efforts after last week's quake

HONOLULU (March 18, 2011) -- At 7:46 p.m. on March 10, Hawai'i time, Chip McCreery, director of the U.S. National Weather Service's Pacific Tsunami Warning Center, was in his government-supplied house 50 feet from the center's headquarters when the first alarm came in about the massive earthquake off northern Japan, roughly a minute and a half after the sea floor had ruptured.

Within four minutes, the Warning Center made its first estimation of the quake's magnitude at 7.9. "We knew that first estimate was likely to be low, but you can't wait around for more accurate readings when every second can mean lives lost," McCreery told Japanese and American participants in an East-West Center journalist exchange program yesterday. The severity of the quake was upgraded to 8.9 soon afterward, and was eventually determined by U.S. and Japanese authorities to have been 9.0 – the largest ever recorded in Japan and the fourth-largest worldwide since 1900.

The Warning Center provides official tsunami alerts to almost every country around the Pacific Rim and most of the Pacific island states. In addition, it serves as the interim warning center for alert systems as far away as the Indian Ocean and the Caribbean. Japan has its own seismic warning system, considered the most advanced in the world.

McCreery said that the Warning Center has at least two observation staff members on duty at all times, and in order to get alerts out as quickly as possible they rely on pre-calculated computer models for a wide range of possible events. As soon as an alarm goes off indicating earthquake readings from a global network of sensors, the staff members on duty try to pull up the model that most closely matches the readings, and then continue to adjust the model as more accurate information becomes available.

"We certainly don't have time to wait around for the computer to do all the calculations of building a whole new model," McCreery said. "In a few seconds, we need to identify the areas that are likely to be impacted and get that information out the door."

Nine minutes after detecting the quake off northern Japan, and drawing on information from Japan's own detection network, the center issued its first international bulletin, warning of an imminent tsunami in Japan, Russia and several nearby islands, and establishing a lower-level tsunami watch for other

Pacific islands, Taiwan, the Philippines, Indonesia, Papua New Guinea and Hawai'i. About an hour and a half later, after receiving further data from deep-ocean sensors, the center expanded its warning to the entire Pacific.

McCreery described the atmosphere at the warning center during a large alert as "very focused and intense. ... We have to get our analysis out to the people who need it, while continuing to run models and update our forecast; we have to try to contact the countries most at risk by telephone, if we can; and we have to update you folks in the media, who are our partners in getting the word out to the public."

He said that as the staff rushes to get life-saving information out as quickly as possible, it can be distressing to consider the possibly severe human consequences of every decision. "But generally you're too busy to think about it too much," he said.

McCreery said that the center's television was out of operation due to renovations at the time of the quake, so the staff did not see the live news images of the terrible destruction taking place in Japan as they rushed to issue their alerts.

Despite the extent of the damage, McCreery praised Japan's preparedness and warning systems. "Although there were high casualties in Japan, there were probably many more lives saved by the combination of efficient civil defense evacuation and preparedness education," he said, including teaching people in tsunami-vulnerable areas to "self-evacuate" by heading to high ground immediately after feeling any strong earthquake.

He said that the severity of the quake overwhelmed Japan's extensive precautions, such as strict building codes and high sea walls designed to lessen tsunami damage, probably in part because few scientists would have predicted an event of such magnitude along that particular fault. "This was bigger than most people in the scientific community thought was even possible there," he said.

He noted that it is difficult for societies to prepare defenses against such extreme occurrences of any type of disaster. "It is extremely expensive to try to prepare for an event of this kind of severity in your area, if it is even possible" he said. "Governments have to weigh those kind of costs against the likelihood of something that might happen only once in a thousand years."

With a Pacific-wide tsunami alert issued after a powerful quake in Chile last year, along with last week's event and other recent

quakes in New Zealand and elsewhere, McCreery was asked whether he thought the Pacific's seismic "ring of fire" was in a particularly active phase. While there is insufficient long-term data to determine if such a thing is currently happening, he said, many seismologists do believe that "over the long term, we do seem to have some periods of heightened seismic activity, along with quieter periods. But there is no factual explanation as yet of why that might be."

McCreery did say that, however, that the possibility would exist for an extended time to come of a destructive aftershock in northern Japan as severe as a magnitude 8 or above. "And sometimes, when a quake relieves stress along one fault line," he said, "it can build up stress in other areas and possibly contribute to other events even a long distance away."

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