



# TOFINO

## Enhancing tsunami warnings

*By Leila Darwish*

## THE SCIENCE

Bordered by the Pacific Rim National Park Reserve and the Pacific Ocean, the District of Tofino is located on the west coast of Vancouver Island. With its sweeping coastline, Tofino is a popular tourist destination, and its year-round population of approximately 1,800 can swell up to 22,000 people during the summer months.

The BC coast is a high-risk zone for earthquakes, and Tofino's exposed location on the west coast makes it susceptible to tsunamis. A tsunami consists of a series of long, surge-like waves that can cause destruction when they strike coastal areas. Most tsunamis are caused by the significant displacement of the ocean floor.

In the case of a major earthquake off the west coast, residents and visitors in Tofino could have less than 20 minutes to get to high ground before tsunami impact. Though critical infrastructure such as the hospital, elementary school, fire department, water reservoirs, and community center are in the safe zone (above 20 metres), roughly 70 percent of Tofino is in the tsunami inundation zone, including the road into town and a majority of the tourist resorts. It is critical that the District of Tofino be able to effectively warn residents and visitors of an approaching tsunami and assist them in evacuating to high ground.

## THE TRIGGER

In 2012, a magnitude 7.7 earthquake struck off the northern tip of Haida Gwaii, on British Columbia's north-central coast. It was the largest earthquake to hit Canada in decades, and it triggered tsunami warnings and advisories along the BC coast. Tofino received a tsunami warning from the US National Tsunami Warning Centre in Alaska. Lacking information from the BC government's assessment of the potential tsunami risk, Tofino sounded its tsunami sirens to notify residents and visitors to move to high ground and gather at the community reception center. Though the tsunami wave ended up being only 12 centimetres, it was a test run for Tofino's Tsunami Warning System and evacuation procedures. The lessons learned from the event helped Tofino hone its tsunami warning system and increase its public awareness programs. The 2012 earthquake also resulted in changes to British Columbia's tsunami notifications procedures.

## THE APPROACH

When it comes to tsunamis, Tofino's main focus is on preparedness and response. Tofino has developed a comprehensive Tsunami Warning System, which uses two outdoor tsunami sirens, texts, emails, phone calls, door to door notifications by first responders, radio alerts, and social media. To decrease confusion for residents and visitors, Tofino is driving the effort to standardize tsunami notification, messages, and testing days with the neighbouring communities of Ahousat, Ucluelet, and Pacific Rim National Park.

In 2015, The District of Tofino partnered with Oceans Networks Canada to install a WERA Northern Radar system at the Tofino Airport that will detect and measure



**Figure 23:** Having a strong Tsunami Warning System is complemented by empowering the public through creative tsunami education events. Tofino's annual "High Ground Hike", funded through a Vancouver Island Health Authority (VIHA) grant, is part of the Tofino Walk For Life program. (Source: District of Tofino)

near-field tsunamis. A recent tropical storm created a storm surge that was also detected by the tsunami detection system, confirming that the detection system works and that it can detect storm surges as well.

Having a strong Tsunami Warning System is complemented by empowering the public through creative tsunami education events. Tofino's annual "High Ground Hike", funded through a Vancouver Island Health Authority (VIHA) grant, is part of the Tofino Walk For Life program. The "High Ground Hike" starts at a site in the tsunami inundation zone, and participants hike to high ground to raise awareness of tsunami evacuation procedures. After the hike, there is a public education event, such as a preparedness fair or a workshop, that further informs the public of emergency preparedness, food security, and survival skills.

As Tofino's many tourists are not familiar with the local area and its hazards, Tofino's Emergency Program has partnered with Tourism Tofino, the Long Beach Chamber of Commerce, and accommodation providers, as they are a vital source of information and direction for tourists during emergencies. Many providers of accommodation have well-established emergency and evacuation plans. Some resorts even have caches of emergency supplies stored in designated high grounds. The aim of this partnership is to help bring the preparedness level of all resorts and hotels in Tofino up to the highest standard in BC. This is being accomplished by delivering business continuity and emergency planning workshops, which also serve as a venue for the sharing of existing emergency plans and resources for the hospitality industry.

## THE OUTCOME

The District of Tofino hosted seven public engagement events and workshops with over 500 participants in 2016. Training and exercises are also key to engaging the public and response organizations in tsunami preparedness and response. In 2016, Tofino offered six training sessions and exercises, and participated in a regional full scale exercise for a Cascadia Subduction Zone earthquake.

Engagement during 2017 included eight Tofino Walk for Life events, some followed by workshops or preparedness fairs, and a Great ShakeOut BC drill event. A recent family friendly High Ground Hike and Preparedness Fair drew over 250 people. Other activities include an Emergency Planning and Business Continuity event with the Hospitality Industry, a workshop targeting seniors, an emergency responder appreciation event with Tofino's mayor, and outreach booths during Emergency Preparedness Week. As of June 2017, over 440 residents and visitors had been engaged with tsunami education.

Tofino's Emergency Management Program is piloting Neighbourhood Preparedness Groups. Clayoquot Biosphere Trust is offering grants of \$500 for each neighbourhood to host a barbeque, during which neighbours can map out evacuation routes and plans, get to know each other better, and identify the resources they have to support each other in an emergency.

## A WORD FROM TOFINO

Emergency Program Coordinator Keith Orchiston emphasized the need to think regionally when working locally. "Along the whole coastline, we are all facing the same hazard. Working to complement each other and leveraging each other's programs is key. Thinking regionally in this approach to tsunamis will go a long way to minimizing issues down the road as more communities start becoming tsunami smart."

Mr. Orchiston also highlighted the importance of accessible information and working with local partners. "Talking about tsunamis can be overwhelming, whether you are a resort thinking of how you will take care of a couple of hundred guests, or you are a young family thinking of how you will evacuate with your children. The success of the High Ground Hike was making the information more accessible and less intimidating. The hike builds muscle memory, and then we move to a skill building workshop. It pulls in demographics that wouldn't normally come to emergency preparedness events. Working with other community groups for the events allows us to access their networks."

At a School High Ground Hike in 2016, Tofino Mayor Josie Osborne stated, "Training is a key ingredient to handling any disaster, and far less costly than learning after the fact. A prepared community is one that can take care of itself, and that starts in our homes and schools by educating children and families about emergency preparedness and response. A prepared community is also one that can offer assistance to those most in need – something incredibly important to a resort municipality like Tofino."