

hydrolink

number 2011

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Prof. Michele Mossa
Editor of Hydrolink
m.mossa@poliba.it

Could David overpower Goliath (again)?

In the previous editorial I highlighted that in recent months there have been many dramatic events which have had a serious impact on our world. One of these events has been the earthquake in Japan with the consequent tsunami which has been responsible for thousands of victims and destruction in the North of the country and enormous difficulties for the population as a whole. As our readers know, I would have been glad to publish a first article on this event in the previous issue of our magazine, but as you might imagine, the situation in Japan has been extremely difficult and our Japanese colleagues, who were contacted to write an article on this subject, understandably, asked me for more time, promising to give their personal opinion on many questions which we cannot afford to put off answering any longer.

I am happy to say that the promise has been kept and that this issue features an article by Prof. Hitoshi Tanaka of the Department of Civil Engineering (Tohoku University, Sendai, Japan) and chairman of IAHR-APD on the tsunami disaster induced by the 2011 East Japan earthquake. The highly interesting news included in this article are followed by an interview with Prof. Tanaka. In this interview, assuming that the history of Japanese natural and man-made tragedies can be considered as a tragedy for the world as a whole, I tried to make the reader reflect on the possibility that our community should carry out much more research into the development of new systems to help us to protect against earthquakes and, therefore, tsunamis and into the development of new systems for the production of alternative energy, such as wave, sea current or wind energy.

In particular, the fear of tsunamis in Japan and the Japanese cultural awareness of menacing tsunamis (but, as previously written, this applies to anywhere where activities are close to the sea) is reflected by Hokusai's well-known iconic woodblock print, which is the cover of this issue of Hydrolink. Copies of the print can be found at the Metropolitan Museum of Art in New York City, at the British Museum in London, and in Claude Monet's house in Giverny, France.

One of the questions that we might pose is how we could try to detect earthquakes and tsunamis rapidly by using warning systems. Studies on this topic have been carried around the world, such as that performed by an Italian research group from the University of Naples "Federico II", which is working on a so-called "Early Warning" system (EW system). The term "Early Warning" was first used during the Cold War years for the detection of nuclear warhead intercontinental missiles. It is important to underline that the methodologies of "early warning" are not systems to foresee earthquakes, since they raise the alarm when the earthquake has already begun. On the contrary, EW systems are based on their ability to reduce natural risks in real time, working mainly on the reduction of risk exposition. Therefore, for example, EW systems can interrupt dangerous activities a little earlier, generally some seconds earlier, than the destructive waves of earthquakes can arrive. Theoretically, these systems could have been used, for example, to shut down the nuclear plant before the arrival of a tsunami.

Japan is certainly the country which has invested most in these systems. It is also the only country with truly effective sensors scattered in territorial waters that can predict the likelihood of a tsunami in minutes, with tsunami evacuation routes posted up and down the coast. Nevertheless, recent events have highlighted that much more still remains to be done. Humanity has always tried to fight against catastrophic or negative natural events to defend itself and its survival. In this arduous fight we have had many successes, especially in recent decades, but we must also admit to many defeats. Some think that these defeats are the normal consequence of our natural inability to contrast all natural events, like the battle between David and Goliath. Personally, I believe that even if there may be a limit to the human capacity to oppose natural events, especially when these are catastrophic (hydraulically we might say events with a large return time), we must not give up fighting this arduous battle against natural calamities. In a way, this has been one of the motivations of our research efforts. After all, David overpowered Goliath once before... Why not again?