LESSONS OF THE L'AQUILA LAWSUIT

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In 1997 the city of Grand Forks, North Dakota, saw devastating **flooding** that caused billions of dollars in damage. Remarkably, that spring flood could be seen coming for months in advance, since the rising waters were the consequence of melting snow that had accumulated over the winter. Yet, even with the ability to anticipate the record flood crest long in advance, the community was taken by surprise by the flood, with some residents having to evacuate in the middle of the night as rising waters threatened their homes.

Following the disaster, I was a member of the US National Weather Service team sent to investigate the production and use of forecasts where something had obviously gone badly wrong. The lessons from that experience can help to shed some light on the current situation in **L'Aquila, Italy**, where seven officials are currently embroiled in a lawsuit brought by the affected community over statements the officials had made prior to the deadly **earthquake** in April, 2009.

On March 31, 2009, in L'Aquila, six days before a deadly magnitude 6.3 earthquake killed 308 people, **Bernardo De Bernardinis**, then deputy chief of Italy's Civil Protection Department , and six scientists who were members of a scientific advisory body to the Department (the **Major Risks Committee**) participated in an official meeting and press conference in response to public concerns about short-term earthquake risks. The public concerns were the result of at least two factors: One was the recent occurrence of a number of small earthquakes. A second factor was the prediction of a pending large earthquake issued by **Gioacchino Giuliani**, who was not a seismologist and worked as a technician at Italy's National Institute of Nuclear Physics.

The deputy chief and scientists held a short one-hour meeting and then a press conference, during which they downplayed the possibility of an earthquake. For instance, **De Bernardinis** went so far as to claim that the recent tremors actually reduced earthquake risks: "[T]he scientific community continues to confirm to me that in fact it is a favourable situation, that is to say a continuous discharge of energy."[1] When asked directly by the media if the public should sit back and enjoy a glass of wine rather than worry about earthquakes, De Bernardinis acted as sommelier: "Absolutely, absolutely a Montepulciano doc. This seems important."[2]

As news of the **L'Aquila** lawsuit has spread around the world, many scientists have rushed to the defense of the Committee by highlighting statements made during the meeting that emphasized the uncertainties in any sort of earthquake prediction. For example, *Nature* reported that at the one-hour meeting the scientists made the following nuanced statements: "A major earthquake in the area is unlikely but cannot be ruled out," and "in recent times some recent earthquakes have been preceded by minor shocks days or weeks beforehand, but on the other hand many seismic swarms did not result in a major event," and also "because L'Aquila is in a high-risk zone it is impossible to say with certainty that there will be no large earthquake."[3]

In the face of these various statements, the lawsuit takes note of the "inexact, incomplete and contradictory information" in its allegations of culpability. While the case is still to be adjudicated under Italian law, some practical lessons can already be drawn by comparing the experience to that which I observed back in 1997 in **Grand Forks**, North Dakota .

One lesson is that the message sent by the government and its scientists might not be the same one received by the public. In the case of **Grand Forks**, the weather service issued a forecast of a flood crest of **49 feet – a record flood** – two months in advance. The point, they explained to our investigative team, was to communicate to the public that they should expect a record flood and, thus, be very concerned. However, the previous record flood was only a few inches below 49 feet, so instead of causing concern, the forecast prompted the opposite reaction. Residents recalled that the earlier flood had caused relatively little damage, and concluded that a flood cresting only a few inches higher would be no big deal.

Similarly, in **L'Aquila**, the government and its scientists seemed to be sending a different message to the public than the one that was received. Media reports of the **Major Risk Committee** meeting and the subsequent press conference seem to focus on countering the views offered by Mr. **Giuliani**, whom they viewed as unscientific and had been battling in preceding months. Thus, one interpretation of the Major Risks Committee's statements is that they were not specifically about **earthquakes** at all, but instead were about which individuals the public should view as legitimate and authoritative and which they should not.

If officials were expressing a view about authority rather than a careful assessment of actual earthquake risks, this would help to explain their sloppy treatment of uncertainties. Here, too, the North Dakota experience is relevant. The **actual flood crest was 54 feet** at **Grand Forks**, exceeding the 49-foot outlook by 5 feet, and caught the community by surprise as they had only built their levees to 51 feet. The average error in previous flood outlooks in the region was a very respectable 10% (about 5 feet, if applied to the 49-foot outlook), but this information was never shared with the public. When we asked officials why this information was not released with the forecast, they told us they were worried that if information about uncertainties was known

then the public would lose confidence in the forecasts.

The **L'Aquila** court case has prompted much discussion and debate in the scientific community. Many scientists have explained that there is no possibility of offering accurate or useful **earthquake forecasts**, as was expressed in an open letter to Silvio Berlusconi signed by 5,000 scientists: "Years of research worldwide have shown that there is currently no scientifically accepted method for short-term earthquake prediction that can reliably be used by Civil Protection authorities for rapid and effective emergency actions."[4] Yet such a view is not universal in the scientific community. For instance, Stanford University issued a press release discussing the case in Italy and countering that earthquakes could in fact be anticipated in some cases. Greg Beroza, chair of Stanford's Department of Geophysics, has called for more forecasts: "[W]e have to make earthquake forecasting as routine as weather forecasting."[5]

This context holds several lessons for the scientific community. First, effective communication of nuance and uncertainty is difficult in the best of cases, and there is often a wide range of perspectives on the state of the science. But it becomes even more difficult when messages are being sent to the public via information that may be heard one way among experts and another among the public. When forecasters in **Grand Forks** intended to send a message of alarm, the public instead received a message of complacency. Similarly, scientists in **L'Aquila** seemed to want to send a message about authority and proper expertise, but the public received a message of complacency in the face of an ever-present risk.

Another lesson is that debates over forecasts and uncertainty often overshadow knowledge that is far more certain. Paul Somerville and Katharine Haynes of Macquarie University note wryly that "no action has yet been taken against the engineers who designed the buildings that collapsed and caused fatalities, or the government officials who were responsible for enforcing building code compliance."[6] The real tragedy of **L'Aquila** may not be that scientists led the public astray with their bumbled discussion of predictive science but, rather, that our broader obsession with predictions blinds us to the truths right before our eyes.

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References:

1. *http://www.economist.com/node/21529006*

2. *http://ca.news.yahoo.com/trial-opens-against-scientists-accused-giving-misleading-big-132746544.html*
Reference for quote: http://www.guardian.co.uk/science/2011/sep/20/italian-scientists-trial-predict-earthquake

3. *http://www.nature.com/news/2010/100622/full/465992a.html*

4. *www.mi.ingv.it/open_letter/*

5. *http://news.stanford.edu/news/2011/september/systematic-earthquake-forecast-093011.html*

6. *http://theconversation.edu.au/manslaughter-trial-of-laquila-earthquake-scientists-will-cause-serious-aftershocks-3477*