

The role of multidisciplinary research and collaboration for improving the resilience of communities to volcanic hazards

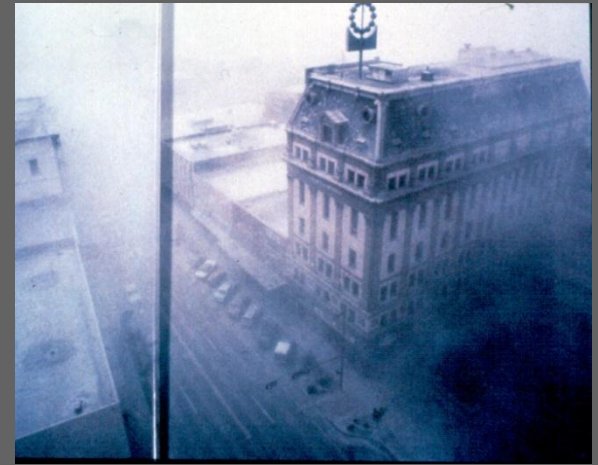


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GNS Science / Massey University





Policy



Practice

Research



VOLCANO HAZARD MANAGEMENT

NON CRISIS

CRISIS

**Risk
Reduction**

Readiness

**Crisis
Management**

- Risk analysis
- Land-use planning

- Volcano monitoring
- Emergency preparedness
- Public education

- Volcano monitoring
- Warnings & public information
- Emergency response
- Recovery

Eruption Events: what has shaped our understanding?

- **Research has been hampered by a lack of systematic impact assessment**
- **Series of reconnaissance trips made overseas to assess impacts, along with local observations**

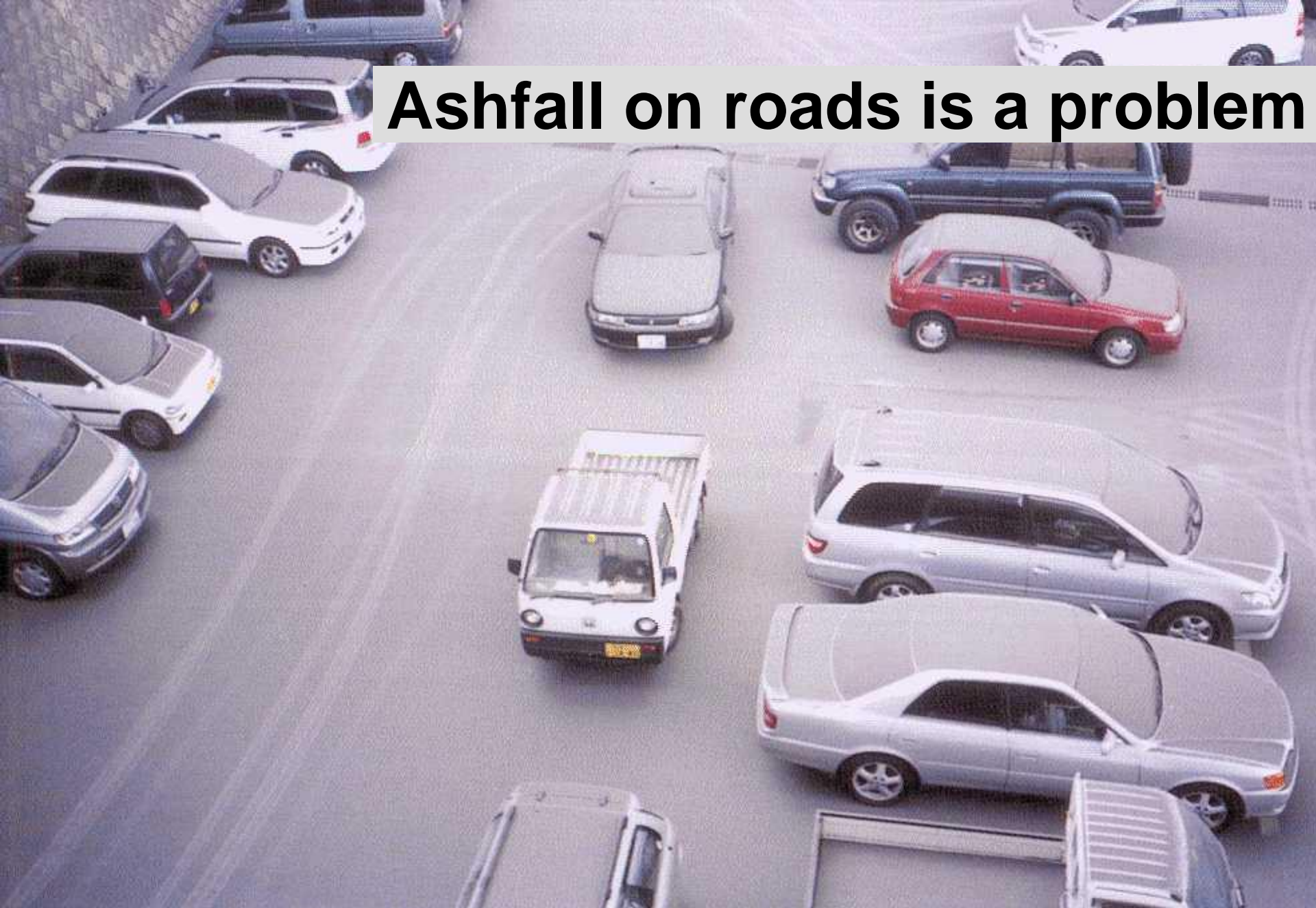



An aerial photograph of Kagoshima City, Japan, showing a dense urban area with various buildings and structures. In the background, the Sakurajima Volcano is visible, partially obscured by a layer of volcanic ash. The city is situated near a large body of water, likely Kagoshima Bay, with a long pier extending into the sea. The sky is clear with a few clouds.

Cities Coping with Volcanic Ash

Lessons learned from the visit of a 7 person party to Kagoshima City and Sakurajima Volcano 11-19 June 2001

Ashfall on roads is a problem





| | |
|------|-----------------------|
| 工事名 | 道路降灰除去(1)鹿児島地区工事(その1) |
| 路線名 | (9076) 幸土5号線 |
| 作業内容 | 清掃 (前) 中 後 大型 |
| 年月日 | 平成12年 2月 23日 |
| 施工者 | 鹿児島道路サービス株 |

Ash greater than 5mm is a severe problem


Ash is cleared within 3 days





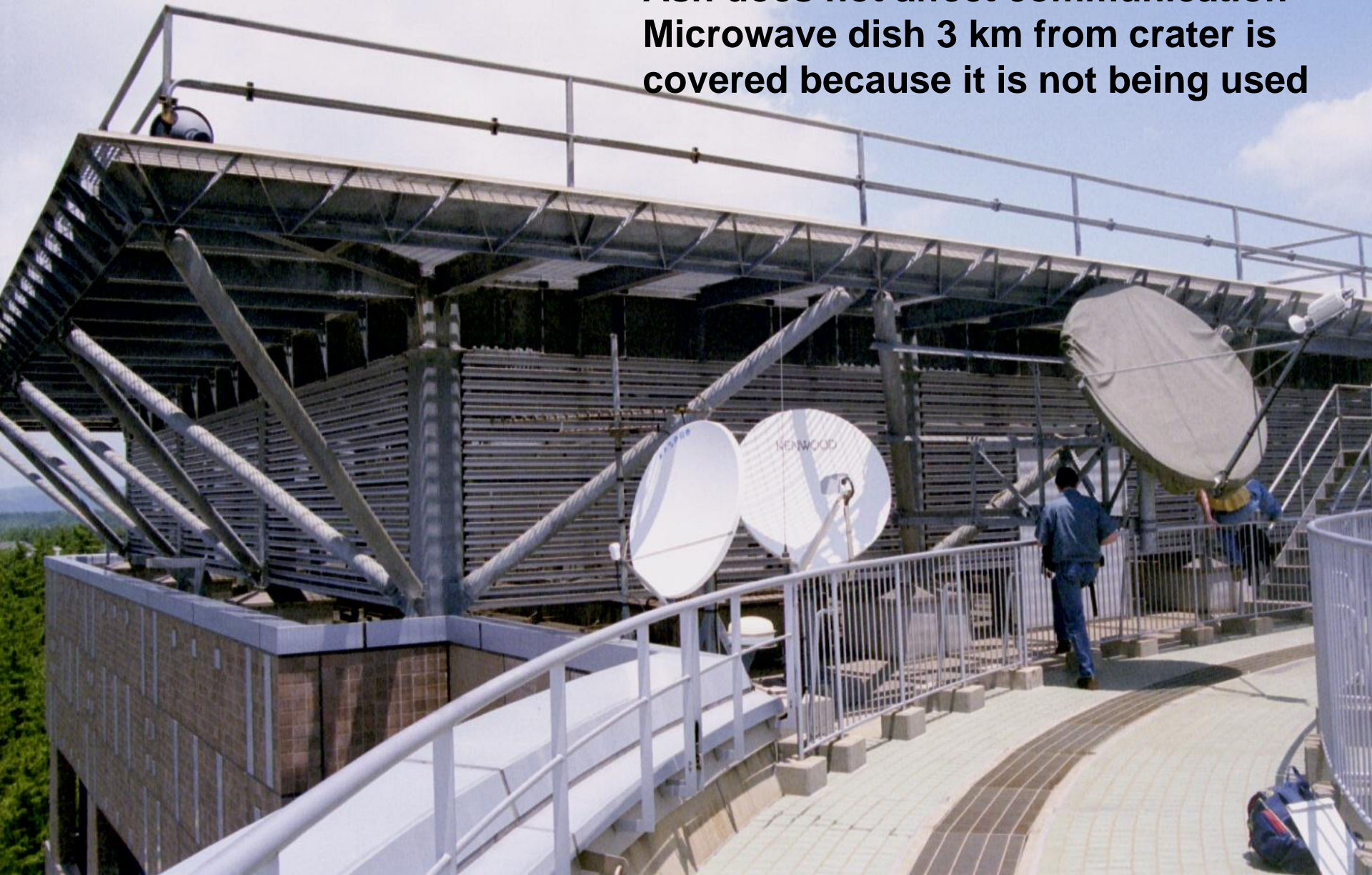
Footpaths are cleaned with hand sweepers

- Note facemasks, goggles and hats



**Ash does not affect power
distribution**

**Ash does not affect communication
Microwave dish 3 km from crater is
covered because it is not being used**



Treatment plant tanks covered because of smell not because of ash



Ecuador 2005





NEW Ash-Impacts Website

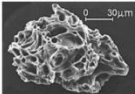
VOLCANIC ASH

WHAT IT CAN DO AND HOW TO PREVENT DAMAGE

[Partners](#)

[Agriculture](#) | [Buildings](#) | [Communication](#) | [Health](#) | [Power Supply](#) | [Transportation](#) | [Water Supply](#) | [Waste Water](#)
Click a category above for effects of ash and how to reduce its impacts [Search](#)

What is Volcanic Ash?



Volcanic ash consists of tiny jagged pieces of rock and glass. Ash is hard, abrasive, mildly corrosive, conducts electricity when wet, and does not dissolve in water. Ash is spread over broad areas by wind.

[\[Ash properties & ash distribution\]](#)

What is it like during ash fall?



Falling ash can turn daylight into complete darkness. Accompanied by rain and lightning, the gritty ash can lead to power outages, prevent communications, and disorient people.

[\[Images & description of ash fall?\]](#)

Technical support for this web site is provided by the [U.S. Geological Survey](#)

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Guidance for homes, business & communities?



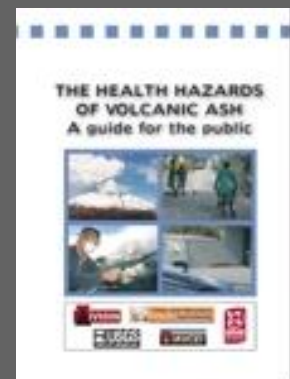
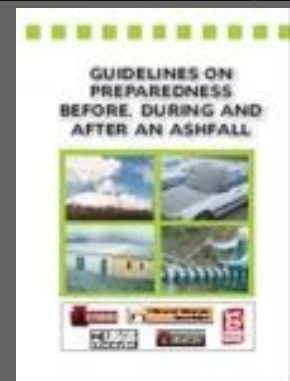
Taking action before, during and after an ash fall can prevent or reduce many of the damaging effects of ash. Removing ash requires disposal sites and coordination among individuals & households, community organisations and businesses.

[\[Actions to take\]](#) [\[Ash clean-up\]](#)

References and Web Links

- References used for this web site; articles, books and other material
- Online Resources

<http://volcanoes.usgs.gov/ash/>

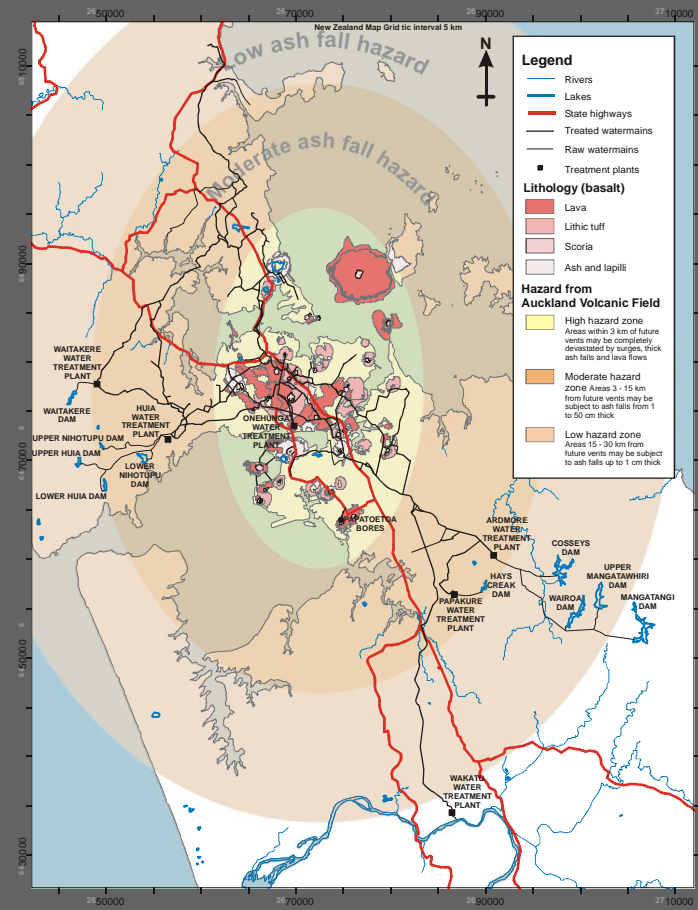


Community behaviour and response to escalating volcanic crisis

What do we know?

– Historic examples

- 1970 unrest at Campi Flegrei, Italy
- 1983-85 Rabaul crisis, PNG
- 1982 Long Valley, USA
- 1895, 1922, 1964-1965 and 1983, Taupo, New Zealand
- Many other examples from actual eruptions

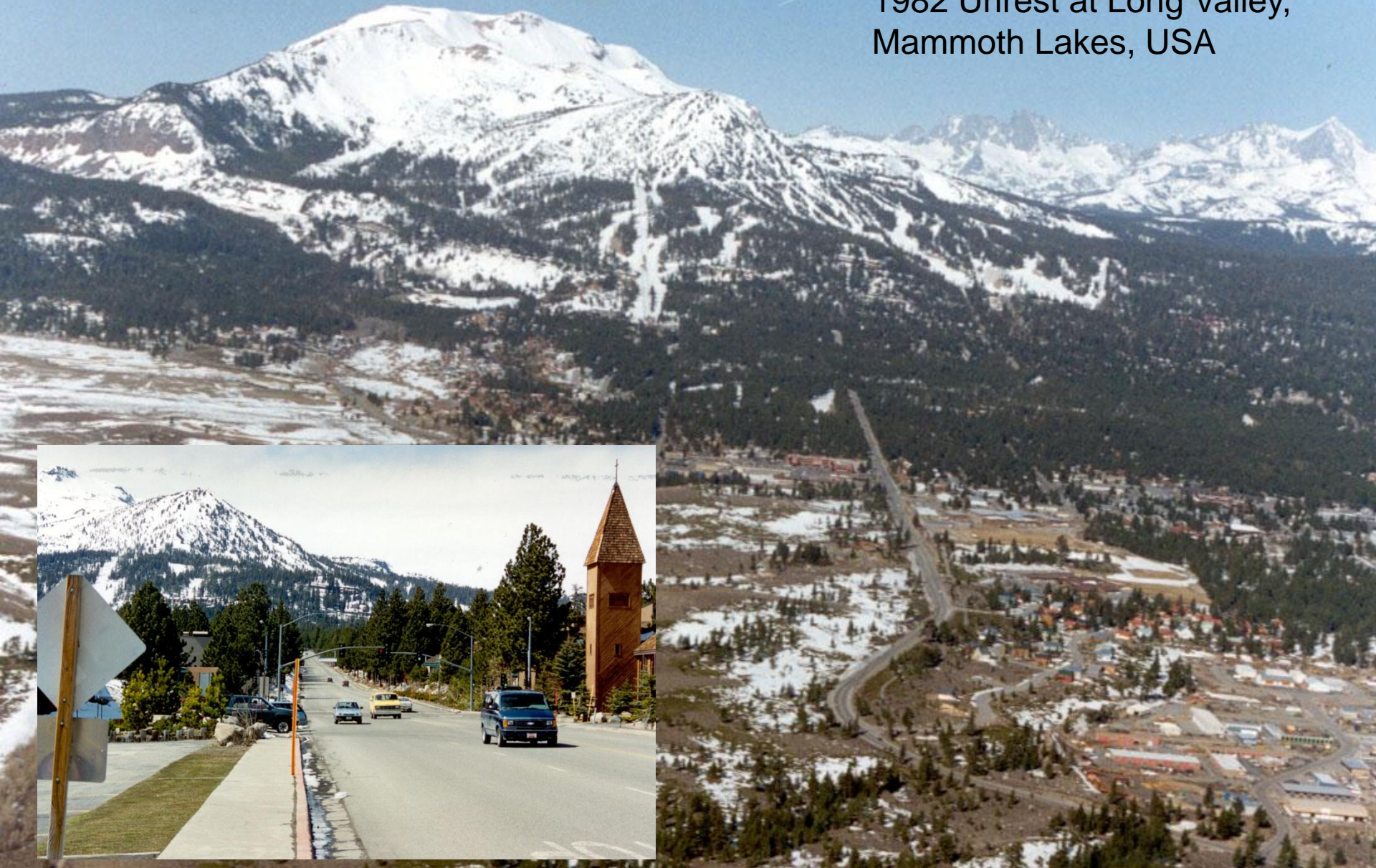


1922 Earthquake Swarm

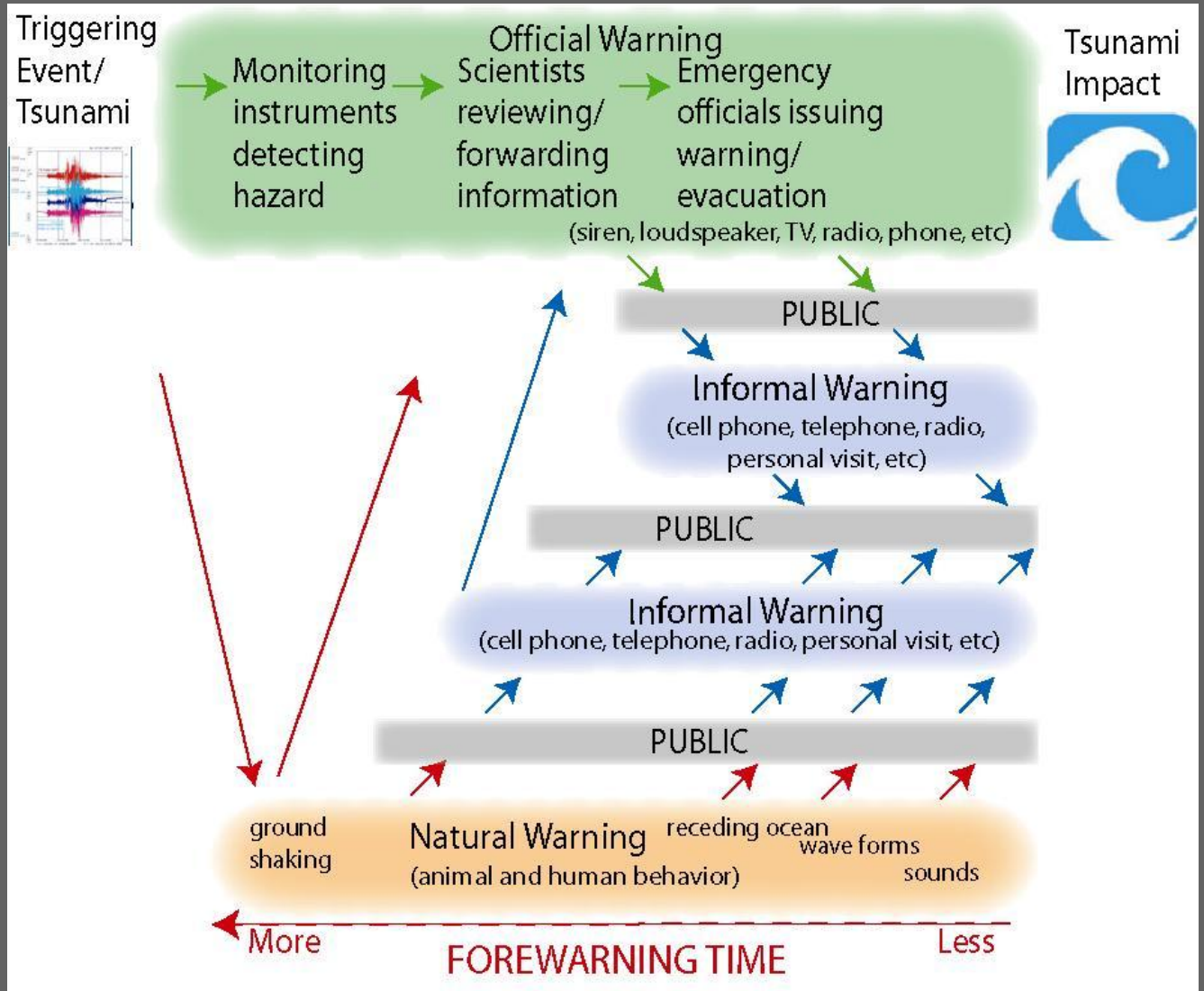
- KEY**
- Faults(active)
 - Epicentral area of earthquake swarm



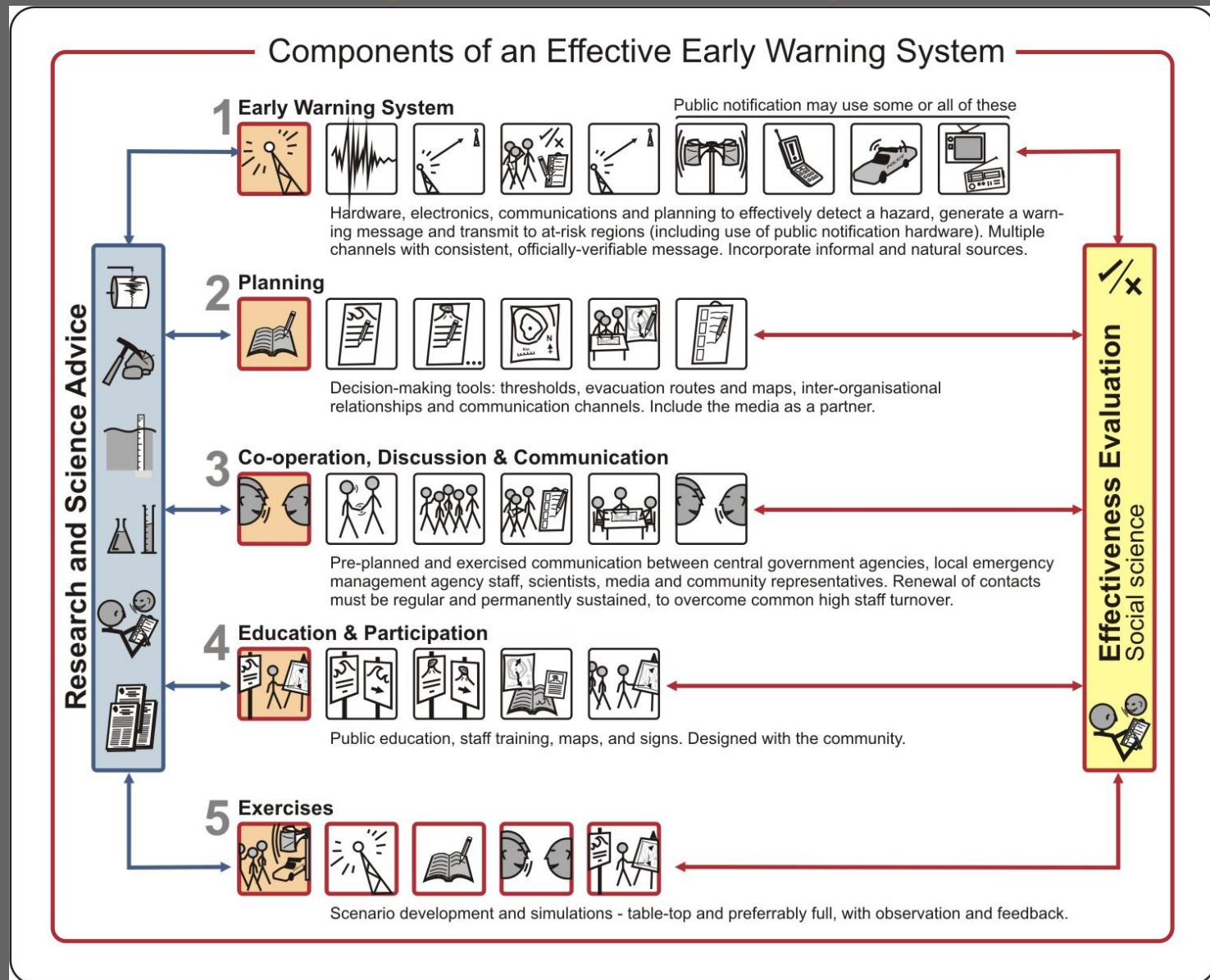
1982 Unrest at Long Valley,
Mammoth Lakes, USA



Warning sources



Effective warnings – an evolving model



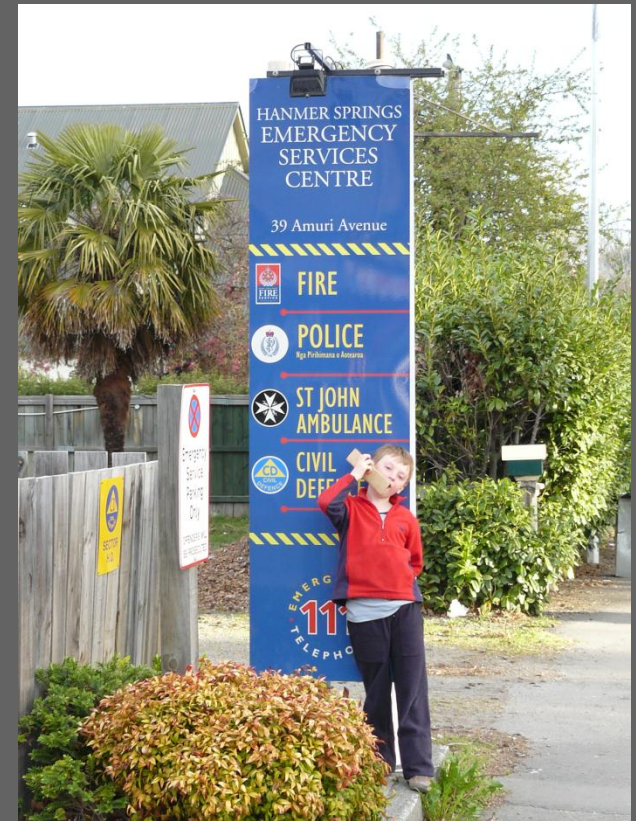
Building community resilience

What attributes does a resilient community have?

What can the EM agencies do to better influence community resilience?

How resilient is our community currently?

Can we measure the impact the agencies are having?



Future efforts must address factors at three levels:

Personal level –

Their belief in the benefits of hazard mitigation (*outcome expectancy*)

Their ability to confront hazards (*reduce negative outcome expectancy*)



Community level –

Encourage active involvement in community affairs (*community participation*)

Develop community ability to resolve collective issues (*articulating problems*)



Institutional level –

Develop an individual's ability to influence what happens in their community (*empowerment*)

The level of trust they have in organisations (*trust*)





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CoV 8 Venue Selection Protocol

Important dates for the selection of Cities on Volcanoes 8 in 2014:

1 October 2012 - **Deadline** for written proposals for hosting CoV8

To have a proposal considered, a nomination must have been received by 1 June 2012

[Click here for the full CoV 8 selection protocol](#)

Email proposals to the 'Commission Leader' via the 'Contact Us' link at left

Background: To date there have been six "Cities on Volcanoes" meetings. The purpose of these meetings is to bring together volcanologists, city authorities, sociologists, psychologists, emergency managers, economists and city planners to evaluate volcanic crises preparedness and management in cities and densely populated areas.

In 1995 the "Volcanoes in Towns" meeting was held in Rome, Italy. From that developed the first "Cities on Volcanoes", held in June-July 1998 in Rome and Naples, Italy with over 100 people attending. This was followed by the second in February 2001 in Auckland, New Zealand, the third in Hilo, USA in July 2003, the fourth in Quito, Ecuador in January 2006, the fifth in Shimabara, Japan in November 2007, and the most recent May-June 2010 in Tenerife, Spain. The seventh meeting is planned for Colima, Mexico 19 - 23 November 2012.

Last Updated (Monday, 30 January 2012)

[Read more...](#)

CoV7 Colima Mexico

Cities on Volcanoes 7 will be held in Colima, Mexico

18 - 23 November 2012

Volcanic Ashfall Impacts Working Group

The Volcanic Ashfall Impacts Working Group was established in 2010 pursuing the following

Windows Taskbar: 10:50 a.m. 23/02/2012

<http://cav.volcano.info/>



Integrated Research on Disaster Risk

addressing the challenge of natural and human-induced
environmental hazards



Issues

- **Globalization**
- **Population growth**
- **Widespread poverty**
- **Changing climate**
- **Urban areas**
 - **Complex infrastructure**
 - **Concentration and centralization of economic and political functions**
 - **Social segregation and**
 - **Complex spatial and functional inter-relationships**

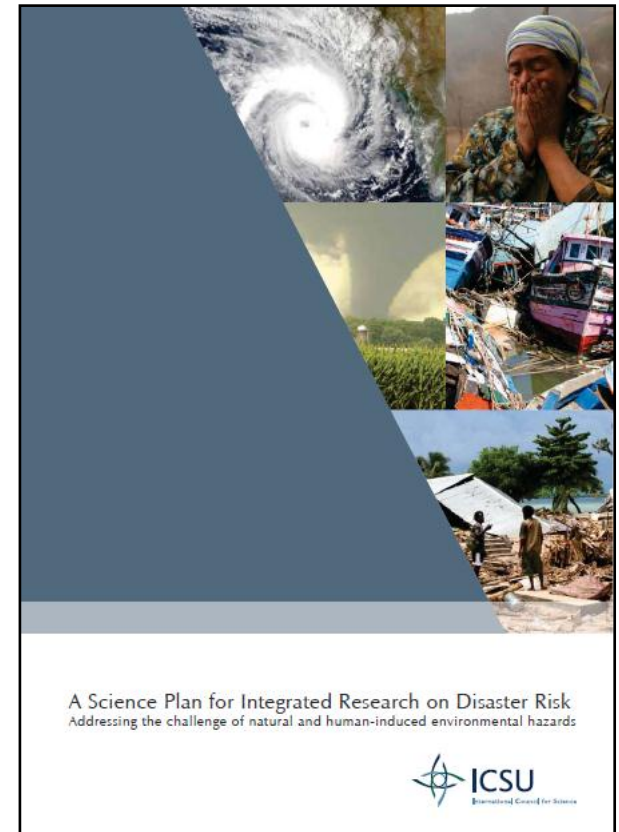
Key question:

Why, despite advances in the natural and social science of hazards and disasters, do losses continue to increase?

The Science Plan

Addressing the challenge of natural and human-induced environmental hazards

An integrated approach to research on disaster risk through: an international, multidisciplinary (natural, health, engineering and social sciences, including socio-economic analysis) collaborative research programme.



Partners

- National and international science institutions
- National and international development assistance agencies and funding bodies
- National IRDR



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