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# Why forecasting eruptions is not enough:

Exploring the complexities of volcanic risk management at Galeras volcano, Colombia



Dr Jacqui Wilmshurst



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# Outline



- Background to the Galeras situation
- Workshop and new dialogue: June to Nov 2009
- Introduction to social science in DRR
- Stories from other hazard contexts
- Application in a volcanic risk context
- Ideas for future work



# Background





# Background

- South West Colombia, Department of Nariño
- Approx 8,000 inhabitants in 'ZAVA'
- Approx 500,000 in potential impact zone
- Eruptions: 1992, 1993, 2004, 2005, 2006, 2008, 2009, 2010





# Background

- Observatory established in Pasto in 1989
- 2005: Decree 4106
  - Disaster situation declared for Municipalities of Pasto, Nariño and La Florida
  - Evacuation orders for alert level 2
  - Long term relocation plans for ZAVA inhabitants
  - Banning of construction of house improvements in high hazard zones where risk cannot be mitigated (national law, all hazards)
- 2006: Evacuation of 6,000 people, no major eruption



# Background



- 2007: Proceso Galeras
  - Mandatory resettlement for inhabitants of ZAVA
  - By Oct 2009, 20 families had relocated out of 2,000
  - Policy states that all families must relocate 'voluntarily' by end of 2011



# Affected Communities:

Jenoy – indigenous/farming

Mapachico – farming/indigenous

La Florida - farming

Pasto - urban



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**ALOJAMIENTO TEMPORAL**  
MUNICIPIO LA FLORIDA  
**BELLAVISTA**

**NIVEL II**  
"Erupción Probable en termino de días o semanas"  
EVACUACIÓN A ZONA SEGURA EN ALOJAMIENTO TEMPORAL

**VEREDAS QUE ALBERGA**

- La Colina, Libertad, El Bosque, Divino Niño, El Placer

**UBICACIÓN**

- 6,5 Kilómetros del casco urbano de La Florida

**ALTURA**

- 2280 m.s.n.m

**ÁREA**

- 1 Hectárea

**PROYECCIÓN CAPACIDAD**

- 80 Familias - 400 Personas

  **PLAN DE CONTINGENCIA**  
"Volcán Galeras"



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# International Workshop

## “Knowledge Sharing and Collaboration in Volcanic Risk Mitigation”

Seminario taller Internacional

### LA GESTION VOLCANICO DEL RIESGO GALERAS

UN COMPROMISO DE COOPERACION Y AYUDA MUTUA

6 al 11 de Julio de 2009 \* Lugar: Universidad de Nariño \* Auditorio Luis Santander

Calle 18 Carrera 50 PBX (+ 57) (2) 7316055/3034 [decsing@udenar.edu.co](mailto:decsing@udenar.edu.co)  
[www.udenar.edu.co/ingenieria/decanatura](http://www.udenar.edu.co/ingenieria/decanatura)  
 Facultad de Ingeniería - Pasto, Colombia

Center for  
**GeoHazards Studies**





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# July 2009

- Points of Agreement
- Points of Conflict
- Conclusions of the workshop





# Workshop Conclusions

- Identified points of agreement and conflict should be used as a start point for further discussion
- Review of current decrees is needed
- Various parties must seek an open dialogue about the different views in order to facilitate conflict resolution. This exercise was an example



# Points of Agreement

- Everyone at the meeting recognizes the problem and agrees on the need to be alert to the warning signs from the volcano and to take action to avoid problems, thus we need "to be more vigilant with Taita Galeras".
- Sincere dialogues should start soon, if we want to find a solution
- It is recognized that life must be safeguarded, but there are different views on how to accomplish this goal.
- Participants recognize that there are differences in knowledge between the stakeholders.
- Galeras is an active volcano that presents at the same time threats and opportunities. However, the stakeholders have different visions on what those threats and opportunities are.





# Points of Agreement

- There is a recognition of the volcanic phenomenon, and the hazard.
- It is necessary to live with the volcano, but also to know that there is an imminent risk
- There is a will to find a solution
- There is a need to improve the communication
- It is recognized that a separation exists among the stakeholders and there is a need for a bridge.
- It is necessary to maintain the bridge once it has been created
- The Universidad de Nariño can become a facilitator of the process.
- Recognition that different visions exist: scientific-community-government
- If we succeed we will be an example, otherwise there will be no advance
- There must be respect for different concepts of life



# Points of Conflict

- The Colombian Decrees-Laws 4106 and 3905,
- Knowing and accepting the concept of hazard
- The coexistence with Galeras volcano
- Lack of official communication toward the communities and coordination between institutions
- Denial of community participation
- Abandonment of communities by the government
- The readings of the instruments should be released
- Volcanic Hazard Map of the zone
- Problems on how the socialization is being conducted
- Recognition of ethnic diversity and the indigenous authorities
- Lack of credibility in the Colombian Institutions



# Points of Conflict

- Sustainability of projects
- Distrust in the technical-scientist
- The working methodology of the Casa Galeras
- There is no integration between the projects and plans of the Colombian Government; there is no continuity of government staff.
- Lack of public policy in government, lack of educational process in risk management
- There is misinformation and disinformation, without listening respectfully to others
- Lack of coordination between institutions
- Several and different interests exist between various stakeholders



# Points of Conflict

- There should be clarity between the institutions involved and clarity toward the communities
- Lack of political will
- Economic interest
- Conflict about the shelters
- Quid pro quo and cronyism of political candidates
- The prominent and opportunistic role assumed by some of the leaders
- Improper handling of information in the media
- Territory and collective rights



# Conclusions

- The identified points of agreement and conflict should be used as starting positions for discussions to frame topics of engagement.
- A review of the current rules and a discussion of the Decrees-Law 4106 and 3905, as well as document CONPES 3501, is needed
- The various parties must be seek an open dialogue between different views about the common problem in order to facilitate agreements for conflict resolution. This exercise is an example.
- The workshop showed that sharing information with a full and frank communication, accepting each other and trying to understand different points of view, as well as enabling facilitation, can begin to resolve situations that have reached the point of radicalized positions in which it is vital to reach a positive outcome.



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# Facilitation Sept - Nov 09





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# Group Members

- CREPAD/CLOPAD Pasto
- Ingeominas
- Proceso Galeras
- La Florida
- Jenoy
- Mapachico
- University of Nariño



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# Eruption – 30 September 2009



# General Objective

“To generate commitments of permanent dialogue between institutions and community for the agreement of sustainable proposals and the decision making with respect by the human rights in three scenes (collective resettlement, individual resettlement and permanence in the zone).”



# Specific Objectives

- To construct strategies of clear and simple communication
- To arrange proposals of alternatives for collective resettlement, individual resettlement and permanence in the zone
- To promote socio-cultural investigation for the benefit of decision making
- To contribute general elements for the participating construction of a regional public policy of education in management of the risk



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# Eruption – 02 Jan 2010



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# What can international collaborators offer?



# Research Considerations

- Varied disciplinary backgrounds:
  - E.g. Volcanology, human geography, psychology
- Strong focus on risk perception
- New research versus application of existing work
- Case specific learning versus ability to generalise
- Disciplinary differences within social sciences
- Debate on role of social sciences



# Input from psychology to date

- Trauma and Response
- Post-event focus rather than pre-event/  
preparedness
- Risk perception work in 1970s - Slovic
- Existing models/theories applied to 'fit' field  
observations ('pet theories')



# What can psychology offer that is new?

- Social sciences focus on contextual/environmental factors rather than individual
- Identifying processes underlying observed behaviour and relationships (e.g. motivations)
- Looking for what is the same, not different (e.g. beyond culture)
- Participating in the change from single discipline focus to multi-disciplinary collaboration



# Ideas for future work at Galeras and in Colombia

- Workshops for authorities and institutions (Ingeominas, Plan Galeras)
- Hazard education for schools and communities in the ZAVA
- Action research into relationships/communication between communities and risk management institutions
- Comparison case studies (e.g. Tungurahua)





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# Transfer of knowledge from other hazard contexts

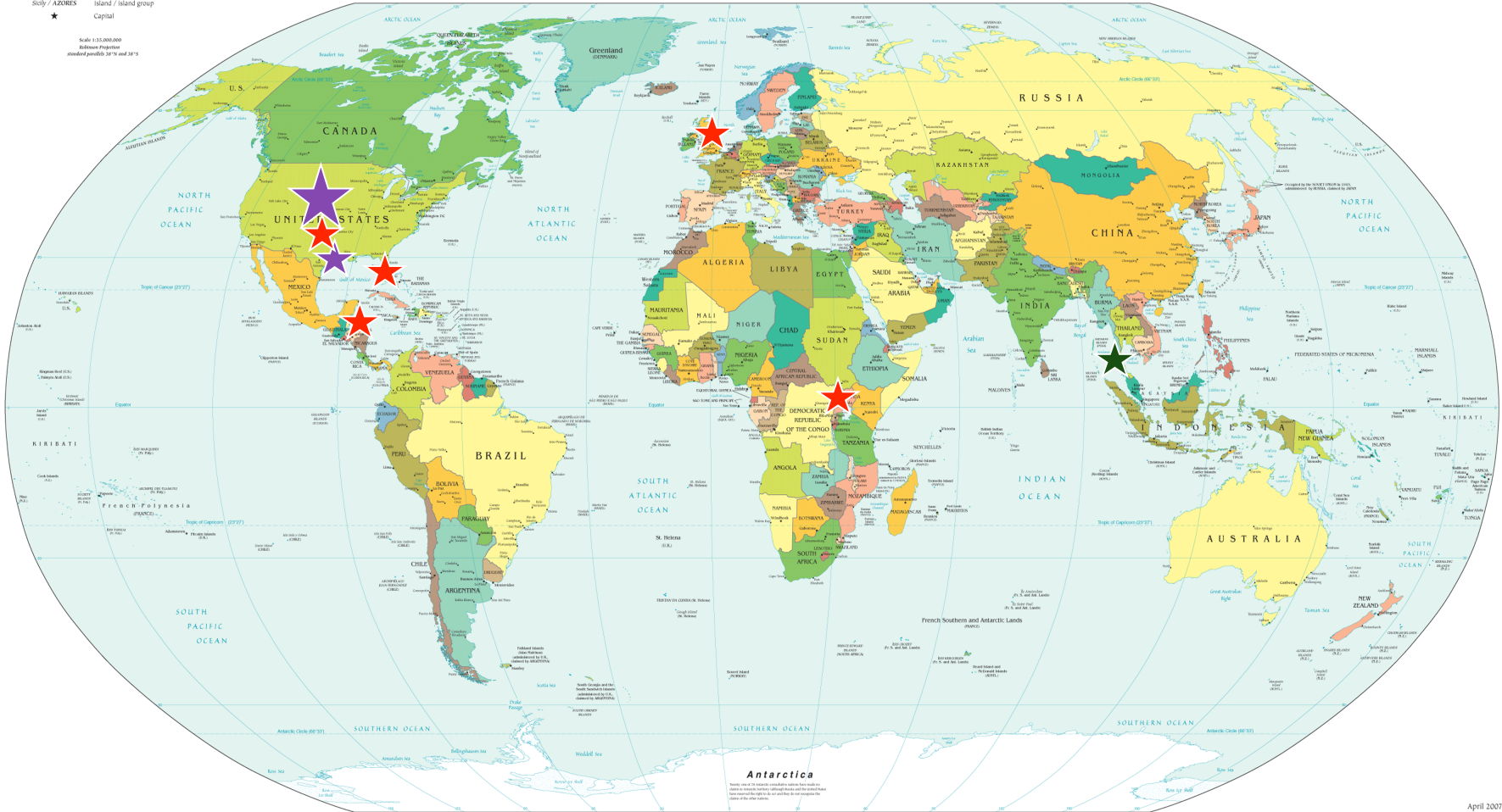


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### Political Map of the World, April 2007

- AUSTRALIA Independent state
- Bermuda Dependency or area of special sovereignty
- Stylized AZORES Island / island group
- ★ Capital

Scale: 1:33,000,000  
Reference Projection:  
Worldwide parallel 30°N and 30°S



April 2007  
Boundary representation not necessarily authoritative.  
 SOURCE: CIA/ISI/USDP



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# PhD Research:



- Florida Keys, USA - Hurricanes
- Yorkshire, UK - Flooding
- Belize, CA – Hurricanes
- Uganda, Africa – Flooding
- Midwest, USA – Tornadoes and severe storms
- All studies included climate change research.



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# Texas, USA: Hurricanes (Ike, Sept 2008)





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# Yorkshire, England: Flooding (July 2007)





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# Belize, Central America: Hurricanes/ Tropical Storm (June 2008)







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## USA: Tornadoes (Oct 2008/June 2009)



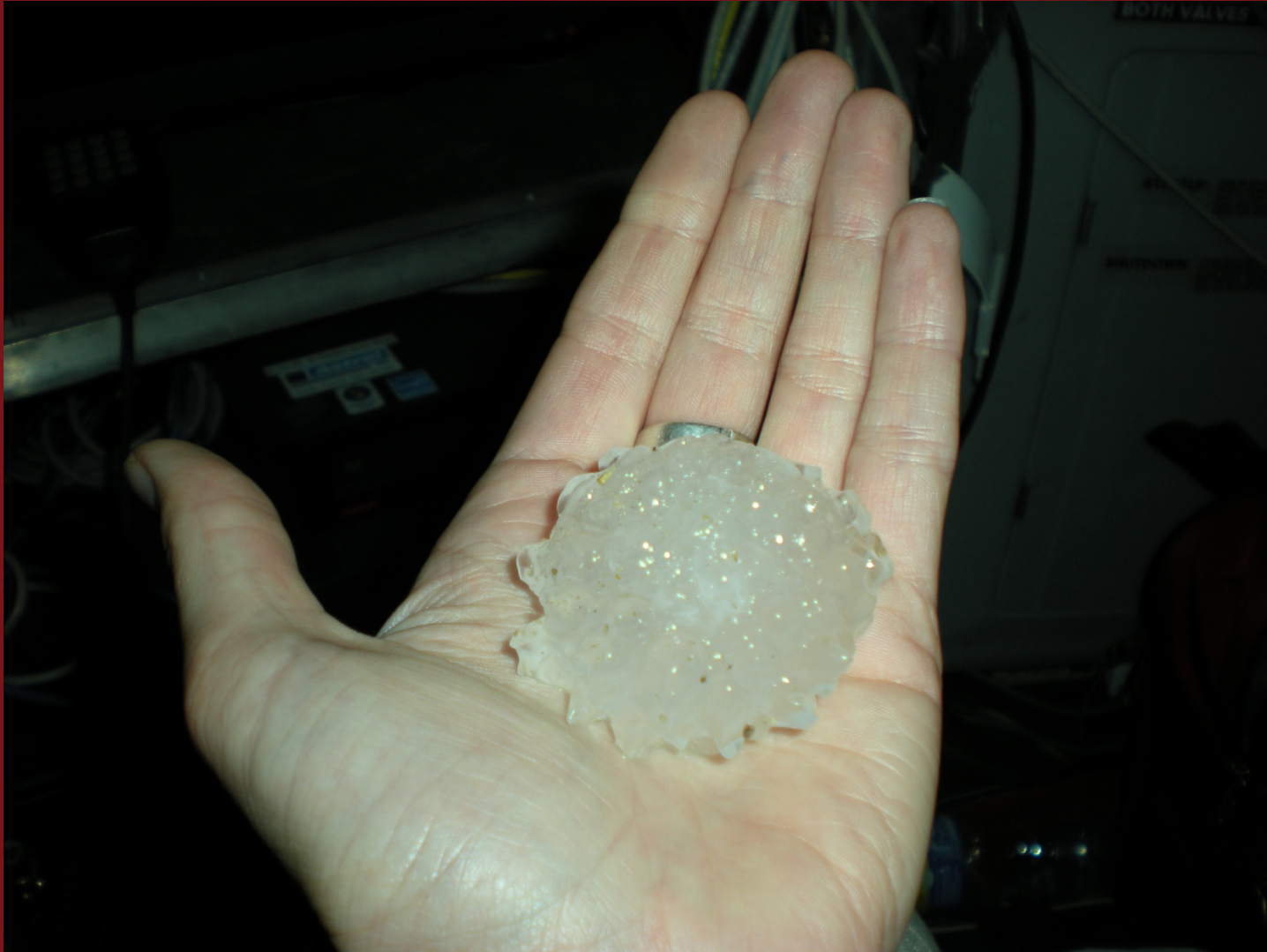


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# UK/Belize: Comparisons

- Experience:

Type	UK %	Belize %
Injury	1	4
Feeling in danger	8	19
Damage to property	48	59
<b>Evacuation</b>	<b>55</b>	<b>46</b>
Damage to workplace	4	30
Disruption to travel	34	41
Loss of services	17	48



# Social science research in volcanic risk so far...

- Heavy focus on 'risk perception'
- Much of the research carried out by geologists due to historical lack of multi-disciplinary collaboration (can cause biases)
- Many assumptions about what people do and why
- Application of theory before identifying what the problems are
- Focus more on theory development than problem solving



# What can be brought to the volcanic risk context?

- Expanding on initial social science work by geologists
- Moving from understanding problems to solving them
  - From theory to practice.
- Beyond risk perception...!
- Volcanoes are unique – permanent features
- New research vs. application of existing theory
  - E.g. Experimental social psychology.
- Human relations practice – participatory action research
- Systems approach
  - Relationships more important than individual components



# What can be brought to the volcanic risk context?

- Familiarity and habituation are very important factors
- Ecopsychology – understanding human relationships with the natural world rather than just with risk
- Use of percentages can be problematic – research by Gigerenzer
- Transactional analysis – Eric Berne
- We need to work on understanding people as much as volcanoes!



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“Tell someone and they will forget, involve them and they will understand” Chinese proverb.



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# Thank you

