Remote Sensing for Hazard Mitigation & Resource Protection in Pacific Latin America (NSF PIRE-0530109)

**Project Overview**

Develop remote sensing tools and validation methods for hazard mitigation and resource protection in Guatemala, El Salvador, Nicaragua, Costa Rica, Panama and Ecuador by:

1. Developing formal linkages among agencies in those countries, focusing on the collaborative development of remote sensing tools for hazard mitigation and water resource development.
2. Building a new educational system of applied research and engineering using two existing programs at Michigan Tech:
   - The Peace Corp Master’s International program and an undergraduate “Enterprise” program.

**Objectives:**

- Develop volcanic gas monitoring programs
- Forecast activity of open vent volcanoes
- Develop satellite- and ground-based programs of topographic monitoring
- Characterize eruptive history of PLA volcanoes
- Perform risk assessment of several PLA volcanoes
- Development of sustained natural hazard monitoring programs using satellite imagery and geophysics

**Participants**

13 Undergraduates (10 MTU, 3 UPRM)
7 Master’s (MS) Students (6 US, 1 Guatemalan)
21 US Peace Corps Master’s International (PCMI) Students
5 PhD Candidates (3 US, 1 Colombian, 1 Guatemalan)
3 Post-docs (2 US, 1 Chilean)

**Counterpart Agencies**

- Guatemala INIS/LUNEH, CONRED, Univ. del San Valle, Univ. de San Carlos, German Development Cooperation
- El Salvador SNET, LAGEO S.A., Univ. del Salvador
- Nicaragua INETER, CIRA, SNV, Omotope field station
- Costa Rica RSN, OVISCORI, Univ. de Costa Rica, ICE
- Panama Univ. de Panama, Instituto Geografico Nacional
- Ecuador Politecnica nacional, INHAM, EMAAP-Q, CIURSEN

**Selected Papers/Conference Proceedings**

2008 Theses:


2008 Workshops:

- Remote Sensing Applications to Groundwater Exploration
  - Short-course at XI Congreso Latinoamericano de Hidrogeolog a
    - July 8-12, 2008, Quito, Ecuador
  - Presented in conjunction with CLIRSEN
  - Topics: Satellite Imagery types, introduction to GIS, fractured bedrock aquifers, using imagery to detect lineaments, fundamentals of natural resource protection

- Remote Sensing Applications to Volcanic Hazards and Gas Cloud Detection
  - MARGINS NSF workshop at University of Costa Rica, June 14-15, 2007
  - Topics: ASTER data, detection of volcanic ash clouds with AVHRR, thermal monitoring of volcanoes from space, application of MODIS infrared data, observing and measuring SO2 clouds from space