Earthquake Disaster Assistance Team

- Formalizes long-standing relationship with USAID’s Office of Foreign Disaster Assistance.

- Purposes:
  - Support OFDA’s response activities.
  - Make USGS experts or scientific services available to assist local geological agencies.
  - Conduct rapid assessment of earthquake, tsunami, and landslide hazards and impacts.
  - Provide advice and training to build capacity in monitoring, hazard asmt., microzonation, etc.

- Can also support capacity-building projects.
EDAT Process

• EDAT members drawn from USGS staff, depending on needs. “Suitcase-ready.”
• Activation of EDAT requires a request for assistance from a developing country.
• OFDA and USGS agree upon scope of work, time frame, deliverables and budget.
• Key: Coordination & capacity-building.
• Work is done in collaboration with local experts.
EDAT Haiti

• Paucity of government, expertise, knowledge.
• Faults poorly known, mainshock poorly recorded.
• Many needs identified.
• Phase 1 EDAT: Fault, landslides, seismology, seismic hazard map, site effects, time-dependance.
Collaboration on seismic monitoring
Existing hazard map (GSHAP)

HAITI REGION
2010 01 12 21:53:10 UTC 18.44N 72.54W Depth: 13 km, Magnitude: 7.0
Peak Ground Acceleration (m/s²) with 10% Probability of Exceedance in 50 Years
Seismic Hazard Mapping

- Good seismic hazard analysis was lacking.
- Purpose: create seismic hazard maps for crisis management and to inform rebuilding.
- Strategy: Use NSHMP PSHA method.
  - 1) Create preliminary maps using existing data.
  - 2) Improve maps when improved information exists.
- Sources of hazard:
  - Crustal faults & subduction zones.
  - Spatially smoothed seismicity (shallow & Benioff zone).
  - Assuming WUS (NGA) attenuation.
- Maps for firm rock & maps using estimated Vs30.
Hazard mapping: Fault sources

<table>
<thead>
<tr>
<th>Crustal fault or subduction zone</th>
<th>Slip rate (mm/yr)</th>
<th>$M_{\text{char}}$</th>
<th>$M_{\text{min}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enriquillo</td>
<td>7</td>
<td>7.7</td>
<td>6.5</td>
</tr>
<tr>
<td>Septentrional</td>
<td>12</td>
<td>7.8</td>
<td>6.5</td>
</tr>
<tr>
<td>Matheux Neiba</td>
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<td>7.7</td>
<td>6.5</td>
</tr>
<tr>
<td>Eastern and central portions of northern subduction zone</td>
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<td>8.0</td>
<td>8.0</td>
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<tr>
<td>Western portion of northern subduction zone</td>
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<tr>
<td>Muertos Trough subduction zone, Neiba segment</td>
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<tr>
<td>Muertos Trough subduction zone central segment</td>
<td>7</td>
<td>8.0</td>
<td>7.5</td>
</tr>
</tbody>
</table>
EDAT seismic hazard map
Preliminary site response map

Vs30 (30-m shear velocity) m/s

Vs30 (m/sec)

> 760
620-760
490-620
360-490
300-360
240-300
180-240
< 180

B
C
D
E
Key Areas of Need

- Seismic monitoring: planning, deployment, operation and maintenance, capacity-building.
- Site effects, microzonation, land-use planning.
- Seismic intensity (how much did the ground shake?)
- Ground-motion attenuation.
- Investigations of active faults.
- Improved seismic hazard map for Hispaniola.
- Urban seismic hazard map for PaP.
- Earthquake scenarios for planning.
- Development of outreach materials.
- Training of Haitian geologists & seismologists.