

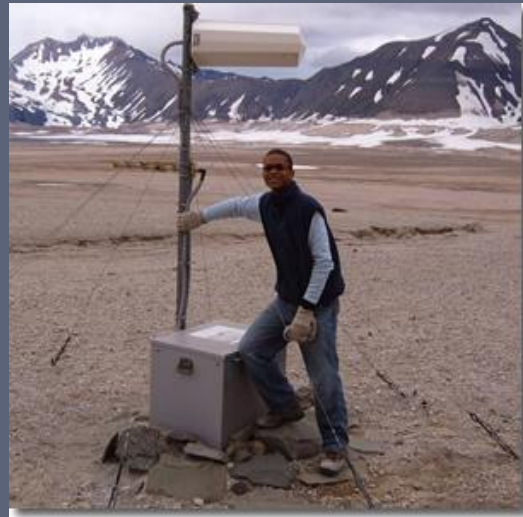
Have you ever considered being a seismologist?

Justin R. Brown, NSF Postdoctoral Scholar



Geophysicists

Measure, examine, model, and explore the physical properties of Earth and other planetary objects, from the depths of the ocean to the tops of volcanoes, from Earth's core to the edges of space and beyond.



Geophysics specialties

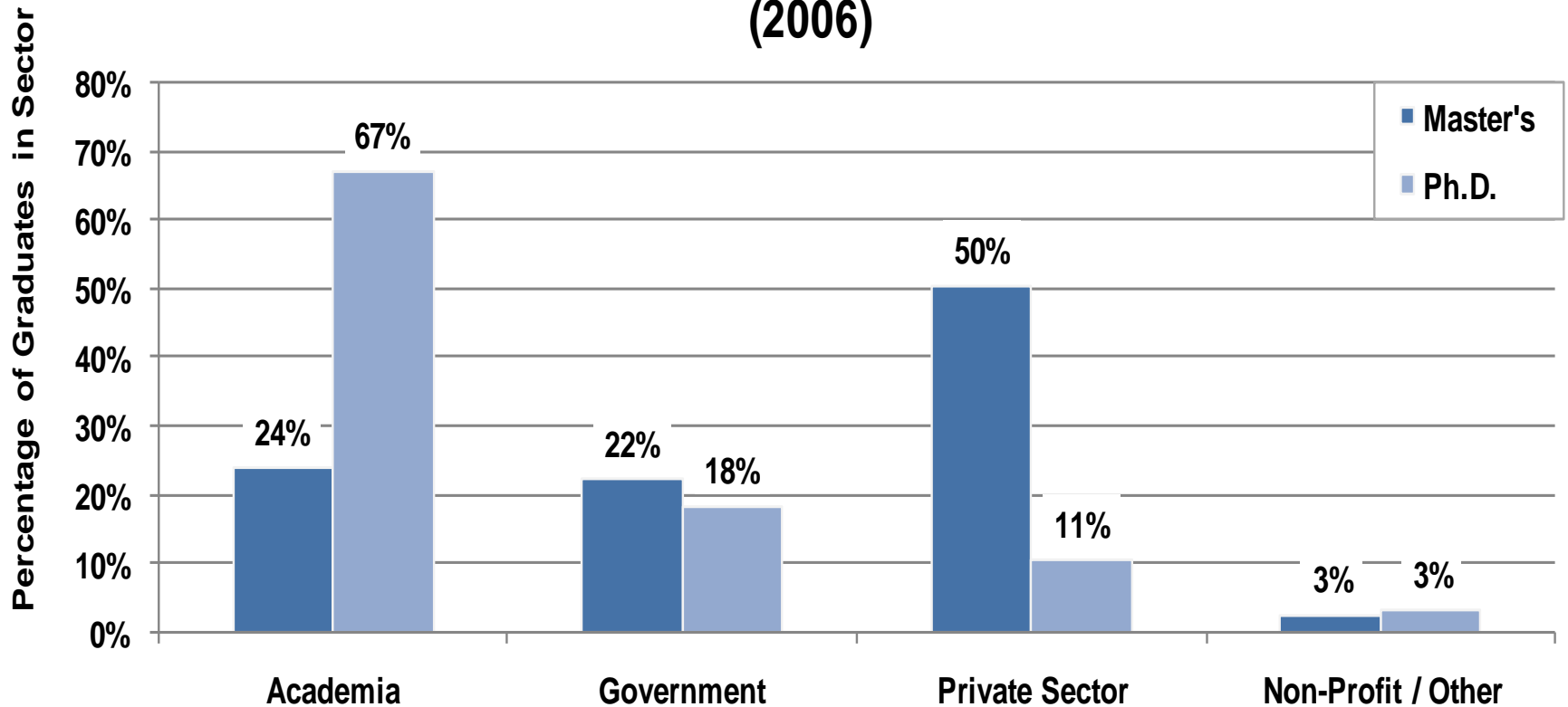
- Seismologist - study of earthquakes and the propagation of elastic waves through Earth or through other planet-like bodies.
- Geodesist – study earth's shape, gravity field, and rotation
- Marine geophysicist
- Petroleum geophysicist
- Mining geophysicist
- Environmental geophysicist
- Exploration geophysicist

Data used....

- Active seismic
- Electrical resistivity
- Electromagnetics
- GPS
- Gravity
- Infrasound
- Magnetics
- Passive seismic

Well-positioned for a GEOphysics career...

Employment Sectors of Recent Geoscience Master's & Ph.D. Graduates (2006)



Source: AGI Geoscience Workforce Program, data derived from AGI/AGU Survey of New Geoscience Ph.D.'s (2006); AGI/AGU Survey of New Geoscience Master's (2006).



Well-paying career options with or without a PhD

Physicist

- \$105,430 (2010 Median)
- Entry degree = PhD
- Job outlook = ↑14% by 2020 (~ average)

Geologist (GEOphysicist)

- \$82,500 (2010 Median)
- Entry degree = B.S (M.S)
- Job outlook = ↑21% by 2020 (faster than average)

Electrical Engineer

- \$87,180 (2010 Median)
- Entry degree = B.S
- Job outlook = ↑6% by 2020 (slower than average)

Geologist (GEOphysicist)

- \$82,500 (2010 Median)
- Entry degree = B.S (M.S)
- Job outlook = ↑21% by 2020 (faster than average)

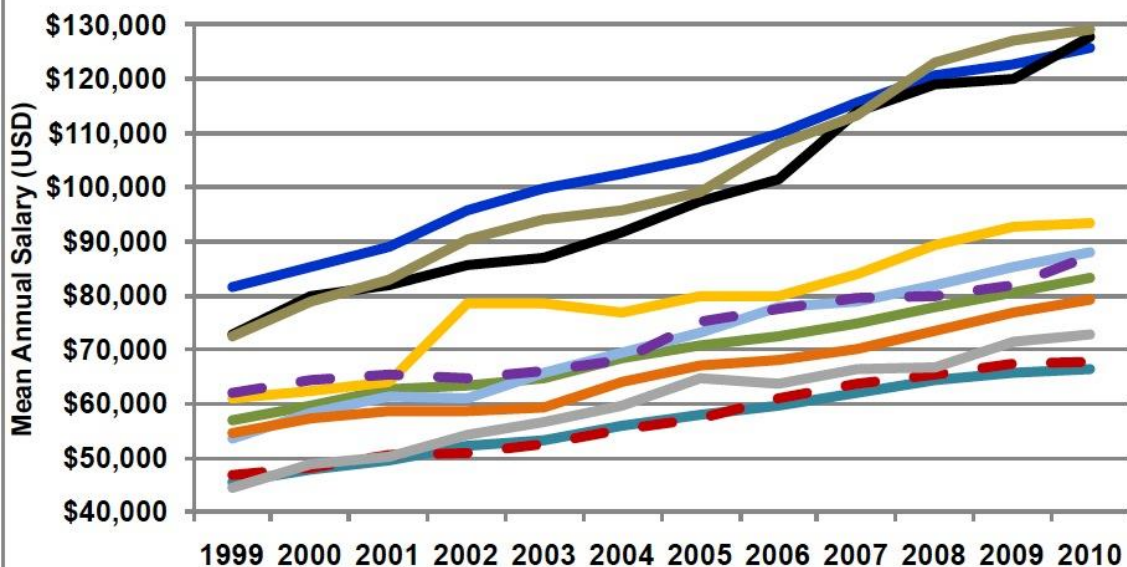
Civil Engineer

- \$77,560 (2010 Median)
- Entry degree = B.S
- Job outlook = ↑19%
(slightly above average)

Geologist (GEOphysicist)

- \$82,500 (2010 Median)
- Entry degree = B.S
(M.S)
- Job outlook = ↑21% by
2020 (faster than
average)

Mean Annual Salaries of Geoscience Professions (1999-2010)



Life, Physical, and Social Science Occupations

Geoscience-Related Occupations

Natural Science Managers

Engineering Managers

Petroleum Engineers

Geoscientists

Atmospheric and Space Scientists

Mining and Geological Engineers

Environmental Engineers

Hydrologists

Geographers

Environmental Scientists

Note, salary data is derived from the U.S. Bureau of Labor Statistics, and is displayed by BLS Occupational coding. See AGI's 2011 Status of the Geoscience Workforce report, Appendix A for full explanation of geoscience occupational categories.

Source: AGI Geoscience Workforce Program, data derived from the U.S. Bureau of Labor Statistics, National Occupational Employment and Wage Estimates

Global Seismicity Map, www.quakes.uq.edu.au

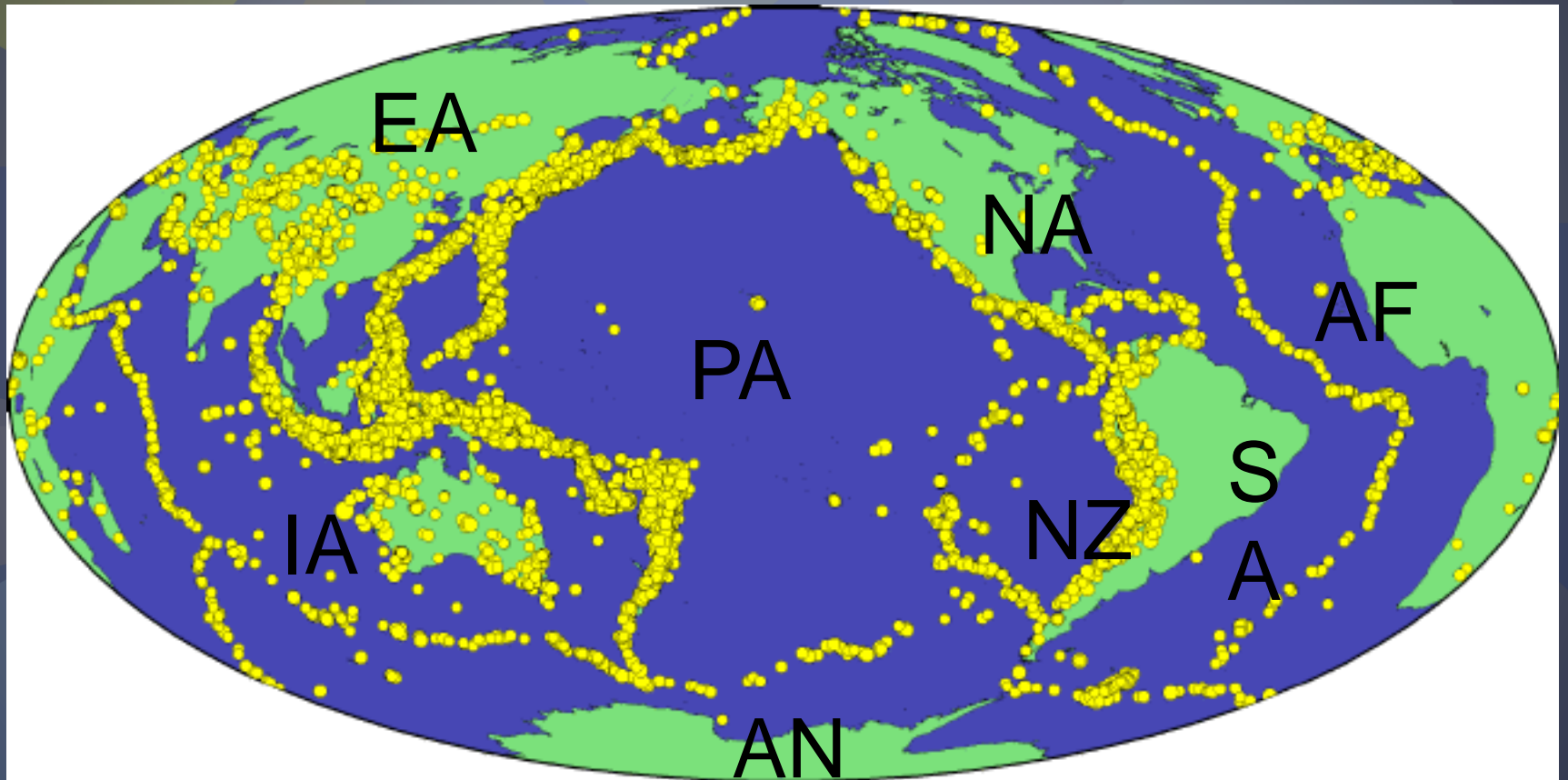
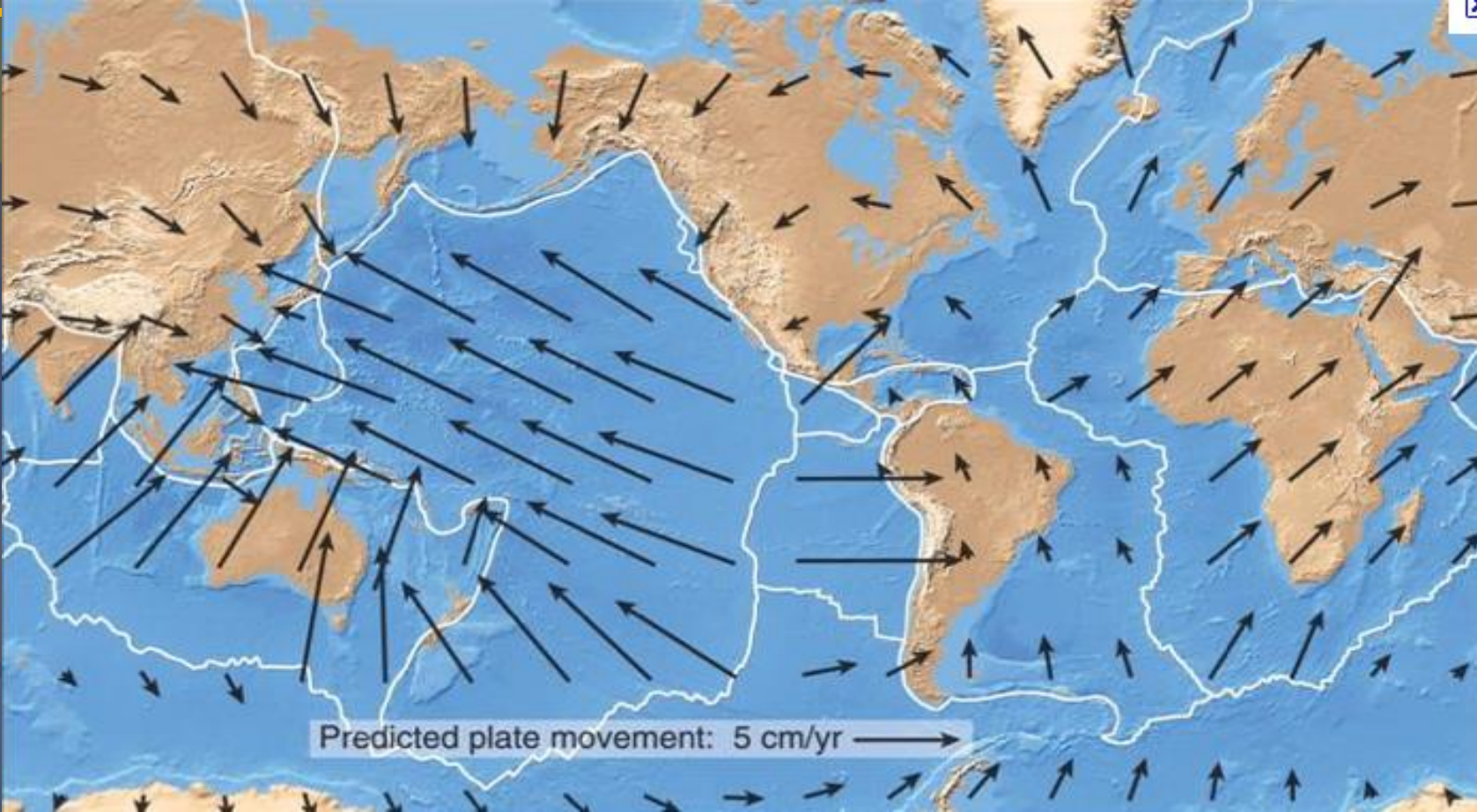


Plate Motions



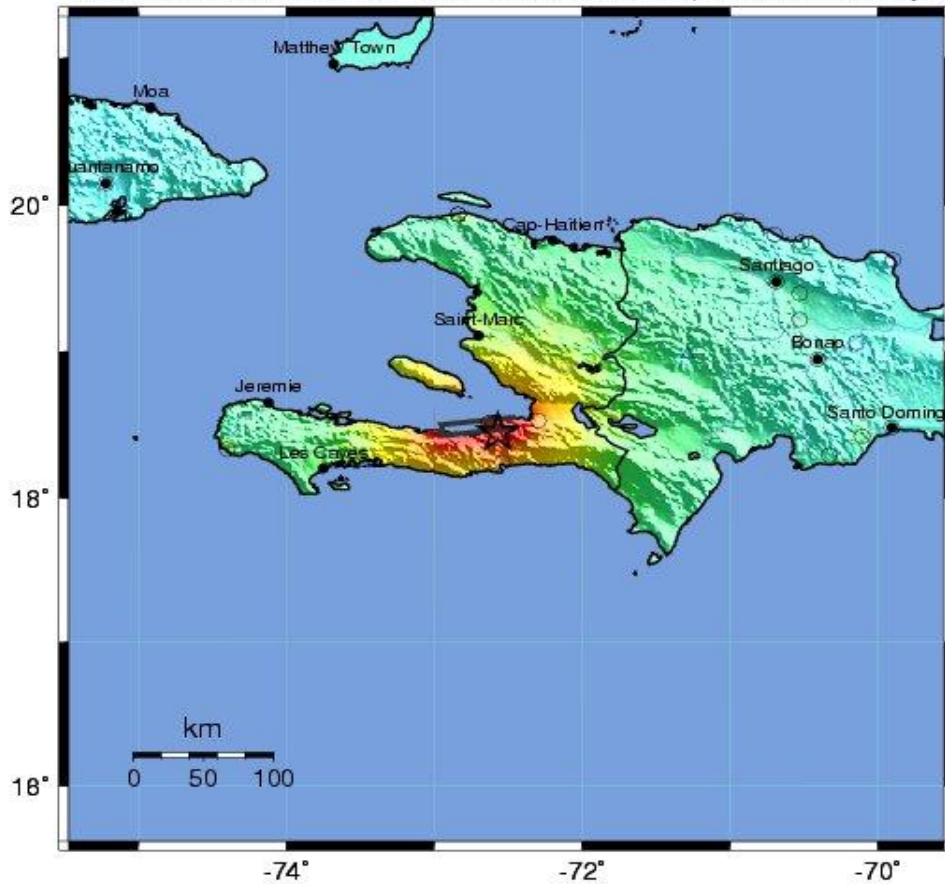
2010- A year of seismic hazard wake-up calls

Jan. 12 M 7.0 Haiti vs. Feb. 27 M 8.8 Chile



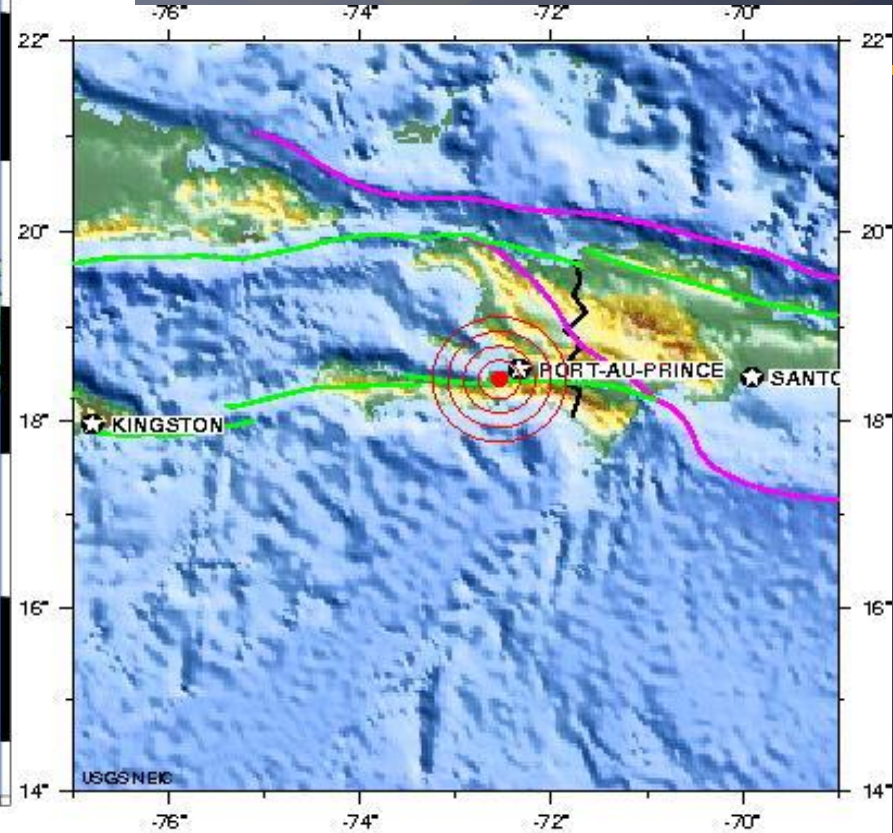
USGS ShakeMap : HAITI REGION

Tue Jan 12, 2010 21:53:10 GMT M 7.0 N18.45 W72.57 Depth: 13.0km ID:2010rja6



Map Version 10 Processed Thu Mar 4, 2010 04:10:14 PM MST - NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-18	18-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



HAITI REGION

2010 01 12 21:53:10 UTC 18.44N 72.54W Depth: 13 km, Magnitude: 7.0

Earthquake Location

USGS,
2010

1
2

Haiti Quick Facts

January 12, 2010, M 7.0 Earthquake

Epicenter was 25 km WSW of Port-au-Prince

230,000 people killed

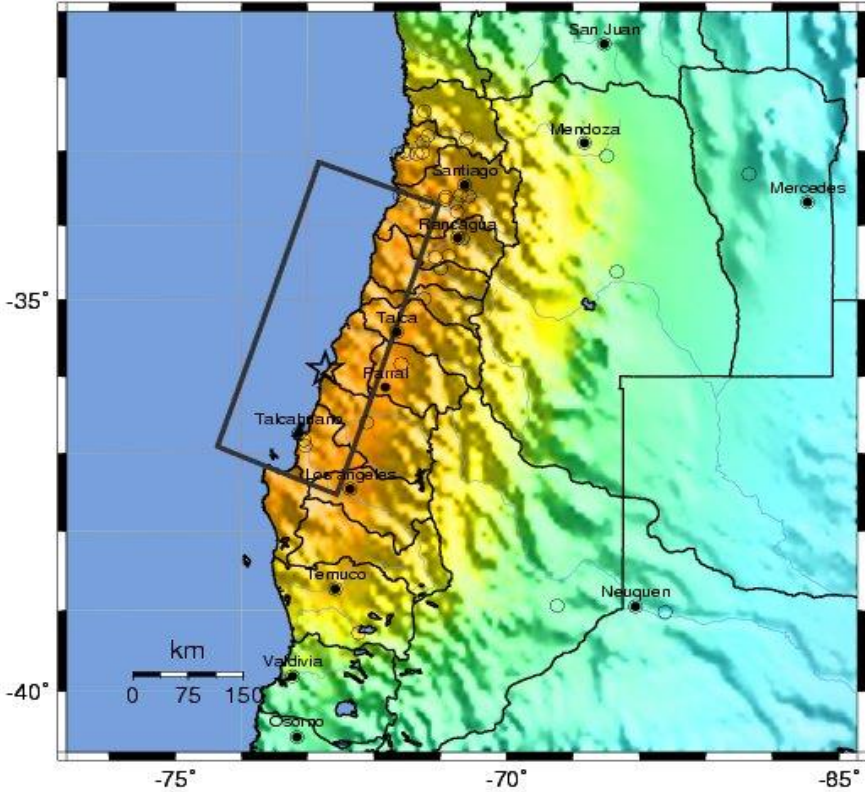
1.5 million homeless

Largest U.S. Urban Food Campaign in History



USGS ShakeMap : OFFSHORE MAULE, CHILE

Sat Feb 27, 2010 06:34:14 GMT M 8.8 S35.91 W72.73 Depth: 35.0km ID:2010tfn



Map Version 7 Processed Fri Mar 5, 2010 03:00:13 AM MST -- NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



OFFSHORE MAULE, CHILE

2010 02 27 06:34:14 UTC 35.998 72.730W Depth: 35 km Magnitude: 8.8

Earthquake Location

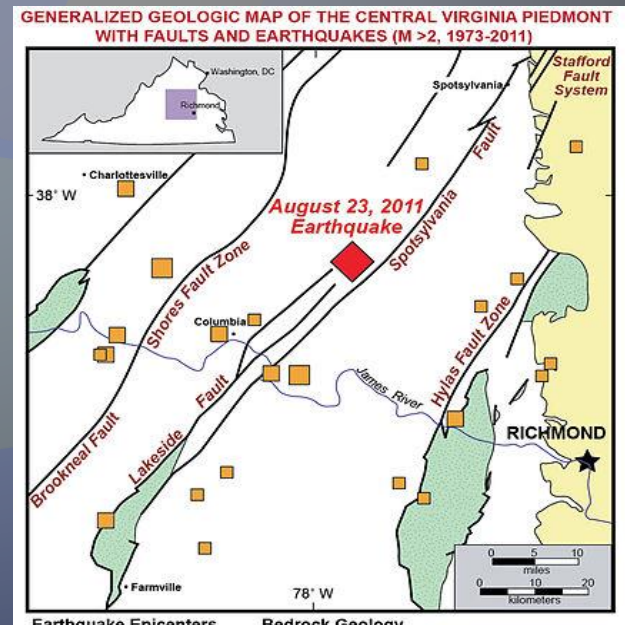
Chile Quick Facts

February 27, 2010, M 8.8 Earthquake
Epicenter was 335 km SW of Santiago
521 people killed
Over 3 minutes of groundshaking
Tsunami Generated 1.29 meters high



2011- A year of seismic hazard wake-up calls

March. 11 M 9.0 Japan, Aug. 23 M 5.7 VA



Geophysics math

- Matrix Algebra
- ODEs and PDEs
- Complex Calculus and Vector Analysis
- Statistics
- Computational Physics

Exploring (GEO)physics further

- Attend Geoscience colloquium Take an elective from the Geoscience Dept.
- Participate in a summer internship experience!
 - IRIS Undergraduate Internships in Seismology
 - UNAVCO's Research Experiences in Solid Earth Sciences (RESESS)

Internship Opportunities



RESEARCH EXPERIENCES IN SOLID EARTH SCIENCE FOR STUDENTS



- Flexible length - 9 to 14 weeks research placements
- Single year only
- Participants distributed both within the US and abroad
- Virtual communication among cohort emphasized
- Research projects include all specialties within seismology
- Travel and weekly stipend
- Full funding to present research at the Fall AGU conference in San Francisco, CA
- Multi-summer diversity-focused
- 11 weeks research placement/summer
- First year interns located in Boulder, CO (2nd-4th year interns anywhere)
- Research projects include a variety of solid Earth science topics
- Travel, lodging, and competitive monthly salary
- Academic year support:
 - Scholarships
 - GRE test fees
 - Funding for conference attendance
 - Graduate school application assistance

Deadline for both programs is February 1, 2014