Seismic Reflection Data – Overview

Seismic Source Characterization

Stu Nishenko
Central Coastal California Seismic Imaging Project Technical Manager

November 30, 2011
SSC Sensitivity Results

Central Coastal California Seismic Imaging Project
Surveys to Date
Future Surveys

Legacy Archive
Summary of SSC Sensitivity: PGA

Hosgri SR
Hosgri Location
Hosgri Dip
Hosgri Rupture Length
Shoreline SR
Los Osos Dip
Los Osos SR
San Luis Bay SR
San Luis Bay Dip
Los Osos C. Thickness
San Luis Bay Rup Length
Shoreline Length
Los Osos Rup Length
SLB C. Thickness
Hosgri Joint Ruptures
Improvements in Geophysical Data Acquisition

Geophysical Instrumentation
Geophysical Data Processing
DGPS Navigation
Geographic Information Systems
“X-rays” v “CAT scans”

Revolution in Resolution
Central Coastal California Seismic Imaging Project Area

1. 2D/3D Low Energy Northern Segment of Shoreline Fault Zone

2. 2D/3D Irish Hills/ Los Osos Valley
2D/3D Low Energy Northern Segment of Shoreline Fault Zone
2D/3D Low Energy
Northern Segment of
Shoreline Fault Zone

2019 line km of 2D/3D Data
Full Fold 3D Cube 17.5 km\(^2\)
1.56 x 3.12 m Bin Size
2D Data @ ~100 m line Spacing
335 line km Processed
PG&E DCPP SSHAC Study

2D/3D Irish Hills/
Los Osos Valley
AWD + Vibroseis + Nodes
2011-2012

Central Coastal California Seismic Imaging Project

1. 3D Low Energy Southern End of Shoreline Fault Zone

2. 2D Low Energy San Simeon-Hosgri Step Over

3. 3D High Energy Seismic Survey (HESS)
FALL 2011

3D Low Energy Southern End of Shoreline Fault Zone

- SubSea Systems AP3000 Triple Plate Boomer
- Geometrics P-cable System
  - 12 to 18 - 50 m long Solid Streamers
  - 8 Hydrophones @ 6.25 m Group Interval
  - Bin Size 3.125 m x 3.125 m
2012

2D Low Energy
San Simeon-Hosgri Step Over

SubSea Systems AP3000 Triple Plate Boomer

Geometrics GeoEel Solid Streamers
24 channel 3.125 m Group Interval
48 channel 6.25 m Group Interval

100 m line spacing
2012

3D High Energy Seismic Survey (HESS)

- 3000 in³ Bolt Air Gun Array
- Four 6 km Streamers w/ 12.5 m Group Interval
- 100 – 150 m Cross Line Spacing
Transition/ Intertidal Zone

Zland nodal systems

Z700 Marine geophone systems
Legacy Data Archive

- Earthquakes
- Geology
- GPS
- LiDAR
- Multi Beam Echo Sounding
- Potential Field (Magnetics/Gravity)
- Seismic Reflection/Refraction
Thank You !