SEISM Metrics Reports to NSF

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SEISM Project Information

SEISM Public Wiki (for most information):

- http://scec.usc.edu/scecpedia/SEISM

SEISM Internal Project Wiki (for internal information including the SEISM proposal)

- https://scec.usc.edu/it/SEISM

At start of project we submitted Software Metrics to NSF, that are posted at:

- http://gtl.usc.edu/home/maechlin/public_html/SEISM_Metrics_Submitted.pdf

Wiki Page for tracking current Metric values:

- https://scec.usc.edu/it/SI2_Metrics_Information

SEISM as SI2 Project

SEISM, as an SI2 project, emphasizes creating sustainable software infrastructure for science.

SI2 Projects are expected to release scientific software.

Our SEISM Proposal mentions 6 software distributions (responsible PI/ primary developer):

- Broadband Platform (Tom Jordan/Fabio Silva)
- UCVM (Tom Jordan/David Gill)
- I/O Library (Yifeng Cui)
- AWP-ODC (Kim Olsen)
- SORD (Steve Day/Geoff Ely)
- Hercules (Jacobo Bielak/Ricardo Taborda)

SEISM Software Distributions as of 28 Feb 2013

- Broadband Platform (BBP): The SCEC Broadband Platform is a software system which generates 0-10 Hz seismograms for historical and scenario earthquakes in California.

http://scec.usc.edu/scecpedia/Broadband_Platform

- Unified Community Velocity Model Framework (UCVM): The SCEC UCVM software framework is a collection of software tools designed to provide standard interface to multiple, alternative, California 3D velocity models.

http://scec.usc.edu/scecpedia/UCVM

SEISM Metric Principles

- Metrics should show progress towards "better" scientific software. "Better" can mean many things.

- Metrics should provide useful information. We plan to refine our metrics until they do provide useful information.

- Metrics should be relatively easy to measure.

Example SEISM Metric

2.2 Number of automated tests in test suites

- Units: Automated tests
- Figure of Merit: More tests are better
- Starting Measure: 0
- Project Goal Measure: 100
- Discussion: Software development will make use of automated test tools based on xUnit test framework. As software development continues, additional tests will be added indicating greater software test coverage.

SEISM Metric Categories

Our Metrics are organized into three categories:

1. Scientific Metrics (4 Metrics Defined)
2. Software Metrics (4 Metrics Defined)
3. User/Usage Metrics (4 Metrics Defined)

SEISM Scientific Metrics

Our Scientific Metrics are designed to measure new scientific capabilities of our SEISM software, and progress toward scientific goals of SEISM project:

1.1. Metric: Number of validation events (simulations?) simulated at 4Hz and above

1.2 Metric: Number of application validation test types in validation gauntlet

1.3 Metric: Number of scientific codebases assessed by the validation gauntlet

1.4 Metric: Number of physics---based PSHA hazard curves calculated using CyberShake platform at 1Hz and higher

SEISM Software Metrics

Our Software Metrics are designed to measure our progress to release of sustainable scientific software:

2.1 Metric: Public software releases

2.2 Metric: Number of automated tests in test suites

2.3 Metric: Number of un-resolved user-reported software problems

2.4 Metric: Time to solution for reference calculations for each released software

SEISM User/Usage Metrics

Our User/Usage Metrics are designed to measure adoption of SEISM software by scientific community:

3.1 Metric: Number computer systems on which our software has passed certification tests

3.2 Metric: Software downloads

3.3 Metric: Training sessions

3.4 Metric: User (groups) adopting our software

Issues Reporting SEISM Metrics

1. We promised to report Metrics on Quarterly Basis. We have not report any metrics so far (we are currently in SEISM Y1 Q3)

2. Many of the metrics are vaguely defined and measurements are ambiguous. We need to clarify these metric definitions.

3. Many of the metrics must be collected for each software distribution. Only Broadband and UCVM are currently distributed.

4. We would like to measure baseline metrics (start of project) and then track changes over project duration. Currently need to collect baseline information for metrics.

SEISM Scientific Metric

1.1. Metric: Number of validation simulations at 4Hz and above (since 1 August 2013)

1. Chino Hills (Hercules)
2. Chino Hills (AWP-ODC)

SEISM Scientific Metric

1.2 Metric: Number of application validation test types in validation gauntlet

This is intended to reference the GMSV groups validation gauntlet. However, the gauntlet is not yet defined, so we count 0.

SEISM Scientific Metric

1.3 Metric: Number of scientific codebases assessed by the validation gauntlet

This is intended to count the number of our codes (AWP-ODC, Broadband, Hercules, SORD) that have generated validation results for evaluation with the validation gauntlet. Currently we count 0.

SEISM Scientific Metric

1.4 Number of physics-based PSHA hazard curves calculated using CyberShake platform at 1Hz and higher

CyberShake development is pushing towards 1Hz. However, we need to show ruptures and SGT work at 1Hz. CyberShake production is working at 0.5Hz and we expect to continue at this frequency until we have several more Los Angeles Maps, comparing CVM-S and CVM-H results.

SEISM Software Metric

2.1 Public software releases

Broadband Distribution since 1 August 2012

- 9 Release candidates posted

UCVM Releases (including CVM-H release) since 1 August 2012

- New CVM-H release posted (CVM-H V11.9.1)

SEISM Software Metric

2.2 Number of automated tests in test suites

Current Broadband Distribution
- 48 Unit Tests,
- 99 acceptance test

UCVM Releases (including CVM-H release)
- 10 Unit Tests,
- 2 acceptance test

SEISM Software Metric

2.3 Number of un-resolved user-reported software problems

Broadband TRAC Tickets
- http://northridge.usc.edu/trac/broadband
- 48 Open Tickets

UCVM TRAC Tickets
- http://northridge.usc.edu/trac/ucvm
- 1 Open Ticket

SEISM Software Metric

2.4 Time to solution for reference calculations for each released software

Broadband TRAC Tickets
- Loma Prieta Validation Simulation

UCVM TRAC Tickets
- Chino Hills Etree Generation with CVM-H and CVM-S

SEISM User/Usage Metric

3.1 Number computer systems on which our software has passed certification tests

Broadband Platform:
• Broadband server, Epicenter, HPCC

UCVM
• Yellowstone, Stampede, HPCC, Kraken, Intrepid

SEISM User/Usage Metric

3.2 Software downloads

Broadband Platform:

- 1 download by USR

UCVM

- 0 downloads

Project Wiki Access – SEISM Y1

Project Wiki Access – SEISM Y1
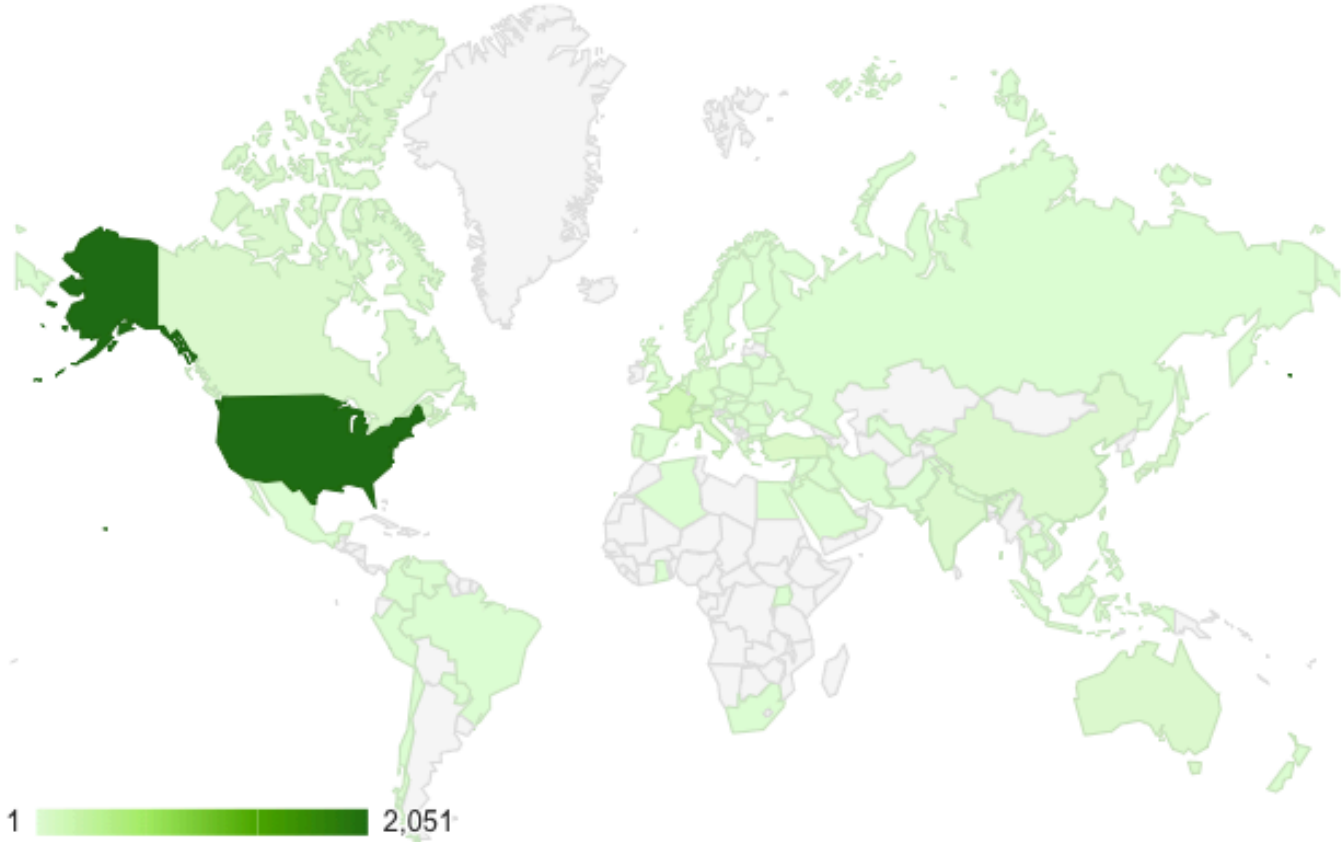
Visits	Pages / Visit	Avg. Visit Duration	% New Visits	Bounce Rate
2,829	**3.68**	**00:04:57**	**35.14%**	**50.09%**
% of Total: **100.00%** (2,829)	Site Avg: **3.68** (0.00%)	Site Avg: **00:04:57** (0.00%)	Site Avg: **35.14%** (0.00%)	Site Avg: **50.09%** (0.00%)

Project Wiki Access – SEISM Y1

	Country / Territory	Visits ↓	Pages / Visit	Avg. Visit Duration	% New Visits	Bounce Rate
1.	United States	2,051	4.37	00:06:10	26.23%	41.35%
2.	France	161	1.10	00:00:26	14.29%	90.68%
3.	Italy	94	2.50	00:02:39	36.17%	57.45%
4.	Turkey	47	4.26	00:07:27	42.55%	48.94%
5.	China	42	2.76	00:02:43	76.19%	54.76%
6.	Canada	33	2.30	00:03:03	78.79%	63.64%
7.	India	32	1.50	00:00:46	90.62%	81.25%
8.	Australia	29	1.97	00:01:47	68.97%	62.07%
9.	Switzerland	25	2.16	00:01:28	40.00%	56.00%
10.	Japan	24	1.29	00:00:08	83.33%	87.50%

SEISM User/Usage Metric

3.3 Software Training sessions

Broadband Platform:
- 0

UCVM
- 0

SEISM User/Usage Metric

3.4 User groups adopting our software

Broadband Platform:
- SWUS Group
- DWP

UCVM
- 0

SEISM Metric Report – 28 Feb 2013

Metric	Current Value	Last Update
Science Metrics		
1.1 Number of validation events simulated at 4Hz and above	2	28 Feb 2013
1.2 Number of application validation test types in validation gauntlet	0	28 Feb 2013
1.3 Number of scientific codebases assessed by the validation gauntlet	1	28 Feb 2013
1.4 Number of physics-based PSHA hazard curves calculated using CyberShake platform at 1Hz and higher	0	28 Feb 2013
Software Metrics		
2.1 Public software releases	9	28 Feb 2013
2.2 Number of automated tests in test suites	Broadband - 147, UCVM - 12	28 Feb 2013
2.3 Number of un-resolved user-reported software problems	Broadband - 48, UCVM - 1	28 Feb 2013
2.4 Time to solution for reference calculations for each released software including research tier and public tier	Broadband (LOMAP Validation Simulation) - xxx, UCVM (Chino Hills Etree) - xxx	28 Feb 2013
User and Usage Metrics		
3.1 Number computer systems on which our software has passed certification tests	Broadband - 3, UCVM - 3	28 Feb 2013
3.2 Software downloads	Broadband - 1, UCVM - 0	28 Feb 2013
3.3 Training sessions	Broadband - 0, UCVM - 0	28 Feb 2013
3.4 User groups adopting our software	Broadband - 2, UCVM - 1	28 Feb 2013

End