

# Quantitative Skills for Solid Earth Geophysics

## NASEM Scoping Meeting

**January 25 and February 4, 2021**  
**1:00-5:00 pm ET each day**

A quantitatively-literate workforce is needed to investigate the multi-scale, multi-physics solid Earth science processes at the core of many scientific and societally-relevant problems. However, such skills are in short supply in some Earth science disciplines. While there exist training networks in academia, national laboratories, and industry, the education and career pathways that lead to skilled quantitative workers and researchers are not robust nor coordinated, and individual academic departments are generally ill-equipped to tackle these challenges on their own. The scoping meeting would bring together stakeholders in academia, government, and industry to discuss new and innovative approaches to develop sustained training initiatives that can fill these gaps at the senior-level undergraduate/graduate-level.

The meeting objective is to develop a new NASEM activity to create a community-driven framework of programming, data analysis, mathematics, statistics, potential fields, continuum mechanics, and computational modules for solid Earth geophysics. The framework could then be refined through discipline-specific applications (e.g., geodesy). The scoping meeting will help explore the space around this idea and develop interest among potential sponsors. This activity is a collaboration of several parts of the National Academies: the Committee on Solid Earth Geophysics, the Computer Science and Telecommunications Board, the Board on Mathematical Sciences and Analytics, and the Board on Science Education.

### Day 1

#### Monday, January 25

Day 1 Zoom link: <https://nasem.zoom.us/j/99184102282?pwd=R1Z1azl1Tk9SaCtMV3A3ZTdrHc3QT09>

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*All times in ET*

1:00 pm	<b>Framing The Problem</b> Cindy Ebinger, planning committee
1:20 pm	<b>Adding Quantitative Training to Geophysics Curricula</b> Craig Partridge and Mark Behn, planning committee
1:50 pm	<b>Plenary Discussion/Clarifying Questions</b> Moderated by Lance Waller, planning committee
2:15 pm	<i>15 minute break</i>
2:30 pm	<b>Breakout Discussions</b> ( <i>participants will be assigned to breakout rooms</i> ) <ul style="list-style-type: none"><li>• What needs to change in current curricula?</li><li>• What are the impacts of curricular changes on the mix and support of students?</li></ul>
3:45 pm	<i>15 minute break</i>
4:00 pm	<b>Report Back and Discussion</b> Rapporteur from each group will summarize main points Synthesis discussion led by Diane Doser, planning committee
5:00 pm	Adjourn Day 1

**Day 2**  
**Thursday, February 4**

Day 2 Zoom link: <https://nasem.zoom.us/j/96227624183?pwd=ZlBESTBrMTIxVitzdktSd2hxK2Qrdz09>

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*All times in ET*

1:00 pm	<b>Recap of Day 1/Overview of Day 2</b> Cindy Ebinger, planning committee
1:10 pm	<b>Participant Perspectives on Key Themes</b> Nicholas Horton, Amherst College Department of Mathematics and Statistics Lillian (Boots) Cassel, Villanova University Department of Computing Sciences Plenary discussion moderated by Lance Waller, planning committee
1:45 pm	<b>Examples of Summer Schools and Other Training Activities</b> Presentations: <ul style="list-style-type: none"><li>• CSDMS – Irina Overeem</li><li>• CIG – Jolante van Wijk</li><li>• IRIS – Mike Brudzinski</li><li>• UNAVCO – Beth Pratt-Sitaula</li><li>• OpenTopography – Ramon Arrowsmith</li></ul> Plenary discussion moderated by Craig Partridge, planning committee
3:00 pm	<i>15 minute break</i>
3:15 pm	<b>Breakout Discussions</b> ( <i>participants self-select rooms</i> ) <ul style="list-style-type: none"><li>• How do we increase the skilled workforce and expand the quantitative skillset in geophysics? What are the workforce needs?</li><li>• What actions could universities take to increase quantitative skills? Where are the resources to do this?</li><li>• How do we interest more students (particularly diverse voices) to the field, train them, and prepare them for careers?</li></ul>
4:00 pm	<b>Report Back and Participant Synthesis</b> Rapporteur from each group will summarize main points Synthesis presented by Kate Miller, University of Wyoming, and Cathryn Manduca, Science Education Resource Center, Carleton College
4:50 pm	<b>Closing Remarks</b> Mark Behn, planning committee
5:00 pm	Adjourn Day 2