

## Key Findings from the 2009 COSEE Scientist Engagement Survey

### SUMMARY STATEMENT

The 315 scientists whose engagement with COSEE in 2009 was documented by this survey are a diverse and accomplished group. A substantial majority of these scientists (71%) hold doctorate degrees, and almost half (45%) of those teaching at the postsecondary level are tenured. They are roughly equally early-, mid- and late-career scientists, and bring to COSEE expertise from a wide range of disciplines. Their gender is relatively evenly split, and the racial background is predominantly white (89%). Almost half (46%) receive NSF funding for their scientific research.

With a survey return rate of 65%, COSEE should be impressed with the enthusiasm and dedication of scientists with which it works. The majority of scientists were engaged with COSEE in 2009 as participants, but substantial minorities also served as resources, were advocates for and/or advisors to COSEE, and/or were partners. Seven percent were leaders within COSEE.

The process of developing and administering this cross-Center scientists survey generated the first “bedrock” number of COSEE Scientists for which there is reliable, consistent and coherent network-wide data about their participation during the calendar year (2009). The effort, which involved all COSEE Centers and the CCO, also strengthened cross-Center understandings and working relationships around network-wide evaluation efforts. This effort may serve the COSEE as it considers optimal and efficient network-wide data gathering efforts in the future.

### Survey Background:

This survey was collaboratively developed and administered by the Evaluation Working Group, the COSEE Center PIs and evaluators, and the National Network Evaluation team. The purpose of this first Cross-Center survey was to better understand who the scientists are who are engaged with COSEE and how they are engaged with COSEE. It was designed to answer, with a high level of confidence, two questions: (1) Who are the scientists engaged with COSEE and (2) how are they engaged? The survey was envisioned as an opportunity to develop and test cross-Center agreed-upon definitions, metrics and processes for gathering network-wide reliable data about scientists (and educators) engaged with COSEE. Results from the surveys are also expected to be useful to Centers for their own purposes.<sup>1</sup>

Through the Evaluation Working Group, and in collaboration with the NNE, all Centers and the CCO developed and used 13 key survey questions (“Tier 1”) and 10 Centers and the CCO administered one or more of the 14 optional (“Tier 2”) questions. Some Centers administered additional (“Tier 3”) questions tailored specifically for their Center, which are not reported here.

COSEE Centers all agreed to survey STEM scientists who were involved with COSEE during the 2009 calendar year (from January 2009-December 2009<sup>2</sup>). In identifying the scientists they would invite to take the survey, Centers used the definition of scientist as defined in the “Bins Document” generated by the Evaluation Working Group: *“Scientist: Anyone doing marine or aquatic research in a scientific discipline (or who has done research in the past).”*

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<sup>1</sup> For full survey results, please see the 2009 Scientists Engagement Survey Excel workbook posted in the National Network Evaluation folder on the COSEE filemanager. Data on scientists engaged with COSEE in 2009 is reported in Section 1.

<sup>2</sup> Some sites also elected to also administer the survey to scientists from earlier years and/or scientists first engaged in 2010 at activities during the survey administration window. This report focuses only on 2009 scientists, but results from all respondents are included in a separate set of analyses in the Excel notebook.

### Survey administration and response rates:

The survey was distributed to approximately 749 individuals whom the Centers considered to be scientists (per the agreed upon definition). Of these, 487 individuals responded, for a 65% response rate, which was considered by the Evaluation Working Group and Center Evaluators to be a very strong response rate.

315 of the 487 respondents (65% of respondents) indicated that they are a “researcher/scientist/engineer” in their primary or secondary role, and were engaged with COSEE in 2009. The discrepancy between the number of respondents who identified themselves as scientists (315) and the number that responded who were invited by Centers that did not identify themselves as scientists (487) indicates to us that a revisiting of this definition and/or how the Centers identify scientists should be done for future surveys.

Summarized results reported in the next sections are for the 315 scientists who responded to the 2009 survey who (1) identified themselves as scientists and (2) participated in the 2009 calendar year. Additional results for the other respondents, Tier 2 questions, and open-ended responses may be found in the 2009 COSEE Scientists Survey workbook (located in the NNE folder of the COSEE filemanager).

### HIGHLIGHTS OF RESULTS - TIER I QUESTIONS ASKED BY ALL CENTERS

#### **Who are the scientists that are engaged with COSEE?**

Scientists work at agencies and institutions located in 32 states, with the largest number in California, Washington and Oregon.

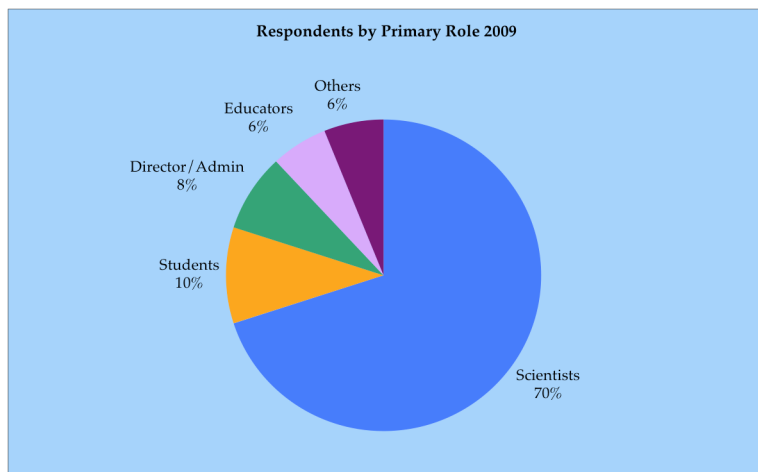


Figure 1. COSEE Scientists' Primary Role

70% have as their primary role researcher, scientist or engineer, including 23% who spend equal time teaching. 8% are directors or administrators in their primary role. 6% are educators, 10% are students, and a handful assume other primary roles. 10% identify themselves as COSEE staff scientists, and 3% work with multiple COSEE Centers.

46% of these scientists receive NSF funding for their science research work.

COSEE scientists span the range of career stages in an equitable way. 28% are early-career professionals, 32% are mid-career professionals, and 25% are advanced-career professionals. 11% are graduate students, 3% are retired and 1% are undergrads.

In terms of gender and race demographics, 45% of the scientists are female; 55% are male. 89% of the scientists are White, 4% are Asian, 2% are mixed/multiple races, 1% each are American Indian or Alaska Native, Black or African American, Native Hawaiian or other Pacific Islander, and 2% checked “other”. 3% declined to respond, and in a separate question, 5% indicated that they were Latino/Hispanic/Spanish heritage.

**How are scientists engaged with COSEE?**

COSEE Scientists play a range of roles within COSEE Centers and the Network (Figure 2.) The majority were participants, over a third served as resources and a quarter were advocates and/or advisors.

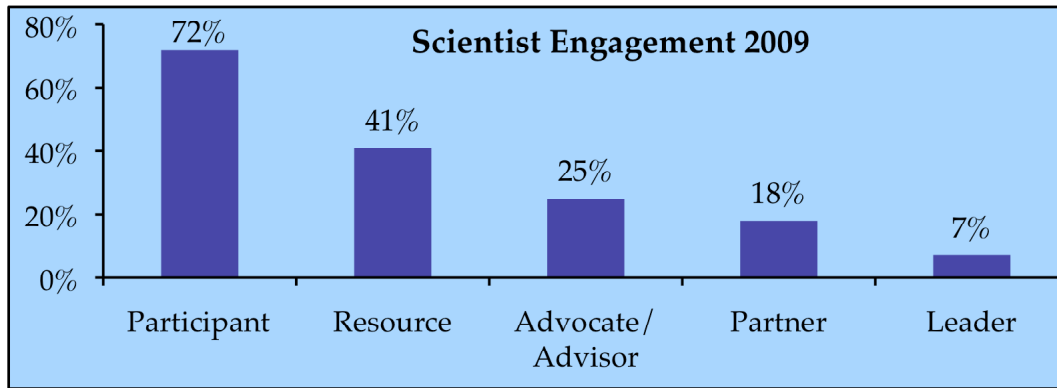


Figure 2. Roles of scientist engaged with COSEE in 2009

Many scientists have been involved with COSEE for multiple years. COSEE Scientists tend to stay connected to COSEE work over time. When asked how many years the scientists had been involved with COSEE, 36% indicated one year, 38% have been involved with COSEE for two or three years, and 17% have been involved for 5 years or more. Figure 3 below indicates the percentages of scientists who were involved with a COSEE during a particular year over the course of COSEE's funding life<sup>3</sup>.

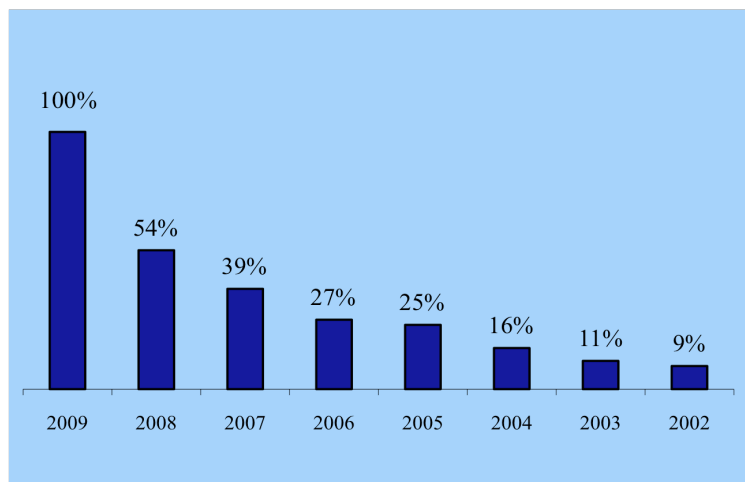


Figure 3. Percentage of 2009 COSEE scientists engaged 2002- 2009

<sup>3</sup> While only 93% of the scientists indicated that they were involved with COSEE in 2009 on this item, another 7% indicated how they participated in COSEE in 2009 in another question. If they checked either question appropriately, we counted them as 2009 participants.

### ADDITIONAL HIGHLIGHTS FROM TIER 2 RESPONSES<sup>4</sup>

**Science Fields:** COSEE scientists represent a wide range of science fields; on average, they checked 1.5 fields. The most common fields were Oceanography (a science field for 48% of responding scientists), Marine Biology (48%), Aquatic Science (33%) and Biology (32%). 13% are in Earth Science, and 11% in Microbiology. Other science fields represented by COSEE scientists are Geochemistry (8%), Technology (7%), Policy (7%), Geology (6%), Atmospheric or Geospace Science (6%), Chemistry (5%), Hydrology (5%), Physics (4%), Meteorology (2%). 14% listed other fields such as Ecology and Fisheries Science. (n=269)

**Degrees Earned:** 71% of scientists engaged with COSEE in 2009 have doctoral degrees, and another 18% have masters. (n=266)

**Types of home Institutions:** 80% of the scientists' primary institutions are academic. 13% are affiliated with government agencies, 3% with non-profits, and 1% with business/industry. 3% listed other affiliations.

**External Funding for Research:** Of those that receive funding for their research, many receive it from NSF (51%), NOAA (42%), and/or other government agencies (42%). Other common funders are academic institutions (32%) and state and local government (26%). (n=268)

**Specifics regarding Ethnicity or Cultural Heritage of Scientists:** 70% of the scientists checked European. Small percentages checked East Asian (4%), Native American (3%), Middle Eastern (2%), Latin American (2%), African (1%), Indian Subcontinent (1%), and non-Spanish speaking Caribbean (1%). 14% checked "other", and 11% declined to respond.

**Scientists who teach:** 70% of the scientists teach. (n=290) Of those who teach, 64% teach in formal settings, 13% in informal settings, and 23% in both. (n=180).

Of those teaching at a post-secondary level most teach undergrads (76%) and/or graduate students (64%) and 45% are tenured. (n=167). 26% teach adults/adult groups, and 28% teach at K-12. (n=196)

Most teach in urban areas or large cities (49%) or small cities (31%). 19% teach in suburban areas, and 17% in rural areas (n=178, with some teaching in more than one setting.) 93% of the fairly small number of scientists teaching at the elementary or secondary level, teach in public schools. A handful teach in private, parochial, and/or charter schools or home school. (n=29; note that only 7 centers asked this question.)

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<sup>4</sup> The findings in this section are based on "Tier 2" questions asked by some, but not all Centers. Numbers in parentheses represent the number of scientists who answered the question, from which the percentages were derived. Additional detail may be retrieved from Section 3 of the 2009 Scientists Survey Excel workbook located on the COSEE filemanager.

**Demographics of Students of Scientists who Teach:** Eight of the 12 Centers asked a question about the percentage of races and ethnicities of students they taught in 2009. (n=100, Figure 4).

<b>What was the racial/ethnic mix of your students or groups you taught in 2009?</b>				
<b>N of centers that included this question</b>	8			
<b>N</b>	100			
	N	Mean %	Median %	Range %
American Indian/Alaska Native %	37	2.4	1.0	1 to 15
Asian (includes Indian, Chinese, Japanese, etc.) %	66	14.7	10.0	1 to 55
Black or African American %	69	8.6	5.0	1 to 50
Native Hawaiian or other Pacific Islander %	13	7.8	5.0	1 to 33
White %	85	69.2	72.0	10 to 100
Other %	45	12.4	7.0	1 to 70
Don't Know %	41	40.1	17.0	1 to 100
Latino, Hispanic or Spanish heritage %	68	12.0	7.0	1 to 65

Figure 4. Racial/ethnic mix of students taught in 2009