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Executive Summary

National Earth Science Teachers Association K-12 Climate Change Education Survey

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From August to October 2011, the National Earth Science Teachers Association (NESTA) made available an informal online survey on K-12 climate change education, and was designed to gather information from current K-12 classroom teachers. The survey included 61 questions about a range of topics including respondent demographics, climate change education in K-12 classrooms school, topics taught, teacher preparation and professional development (in Earth and space science in general and climate change in particular), the educational resources teachers use, their preferences and needs for professional development and the challenges they face in teaching about climate change including school and community pressures. In addition to these questions, we also surveyed teacher understanding of climate change, using a selection of questions from the Leiserowitz et al. (2011) survey of climate change knowledge[1]. Information about the availability of the survey was shared through numerous online newsletters, websites, and listserves, encouraging as many educators as possible to respond to the survey. Overall, the survey had a total of 1909 respondents including 1235 current educators, 766 of whom teach K-12 students. 555 of these teachers are K-12 teachers in the United States who currently teach about climate change. The survey was designed to route respondents to different sections of the survey depending on their previous responses. In a first look at this rich data set, we have examined the responses of active US K-12 teachers teaching about climate change.

Survey results show that there are potentially significant differences in climate change education practice, preparation, challenges and understandings based on gender, region of the country (Western states, Southern state, and Northeastern states), area of the school (rural, urban, or suburban), levels of college preparation and in-service professional development, and age of teacher. Overall, however, survey respondents clearly have an understanding of climate change that is more representative of the scientific consensus than adults and teens (Leiserowitz et al., 2011). On average, 89% of respondents indicated that they believe global warming is happening (compared to 63% of adults in the Leiserowitz study), with the highest levels of agreement from respondents in Western states, younger teachers, urban teachers, and females. Only 6% of respondents indicated that they did not believe global warming is happening (compared to 19% in the Leiserowitz study). On average, only 13% of respondents attribute climate change to mainly natural causes (compared to 35% among adults in the Leiserowitz study), with the highest rates of this response among male and Southern respondents. Western and Northeastern teachers expressed significantly more concern about global warming than Southern teachers, while over 20% of male respondents indicated that they were “not at all worried about climate change”.

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[1] Leiserowitz, A., Smith, N. & Marlon, J.R. (2011) *American Teens’ Knowledge of Climate Change.* Yale University. New Haven, CT: Yale Project on Climate Change Communication. http://environment.yale.edu/uploads/american-teens-knowledge-of-climate-change.pdf

Climate change educators make extensive use of educational resources made available from professional societies, federal agencies, and universities, and to a lesser extent resources made available from other non-profits and for profit organizations. Respondents expressed a strong preference for professional development experiences offered near where they live, as well as for participating in a climate change research experience with a scientist at a local university or research lab. Their least desired options for professional development include webinars, self-paced learning, and lectures and science cafes. Climate change educators use educational resources made available through federal agencies and trusted long-lasting educational programs from a range of organizations, and make comparatively little use of resources developed through more recently developed programs. 96% of respondents report teaching about climate change embedded in other courses, rather than in separate courses dedicated to climate change, with the majority of teachers (71%) teaching alone in their classrooms, rather than in teams. Climate change is most frequently taught in Earth science and geology courses, followed by Environmental Science and Biology, but is included in a wide range of other courses in the curriculum.

Respondents indicated that they note an increase in positive attitudes about the teaching of climate change science in their school (~50%), with 27% noting no change in attitude, and ~12% noting an increase in negative attitudes. ~38% of respondents noted as a challenge that "students have misconceptions about climate change that are hard to address", and ~25-30% noted that students, parents, administrators, or community members have argued with them climate change is not happening, or is not the result of human activity. It is clear that teachers who have not had college course work on climate change nor in-service professional development on this topic have more difficulty finding resources to use in the classroom, and do not know enough about the basic science of climate change relative to teachers who have had this preparation. Furthermore, their responses indicate that they are much less likely to use a wide range of classroom enrichment materials than their colleagues who have more preparation in this area.

36% of respondents indicate that they have been influenced in some way (directly or indirectly) to teach "both sides" of climate change. While only 5% of teachers report being required to teach both sides (12% in Southern states, 3% in Western states, and 1% in the Northeast), about 47% report doing so because they believe that there is validity to "both sides". Survey comments indicate that a significant number of teachers believe that if they teach both sides, students will be able to make their own decisions about what to believe.

When asked what they need to do a better job teaching about climate change science, 54% of respondents indicated resources for content and teaching materials, 36% mentioned professional development on content and methods, and 35% mentioned data, models, and more current information.

A more complete analysis of the survey results for this subset of the survey respondents will be made available on the NESTA website in early 2012.