

The NISE Network Space and Earth Informal STEM Education (SEISE) project was funded through the National Aeronautics and Space Administration (NASA)'s Science Mission Directorate (SMD) Science Activation program. The National Informal STEM Education Network (NISE Network) is a community of informal educators and scientists dedicated to supporting learning about science, technology, engineering, and math (STEM) across the United States; overall 513 NISE Network partner organizations participated in the SEISE project between 2015 and 2020.



Evaluating the impact of the project

Evaluations were focused on understanding the overall impacts of the SEISE project on professionals' Earth and space work, as well as the impacts of SEISE products on the public's interest, engagement, relevance, and understanding of SMD content areas (Earth science, heliophysics, planetary science, astrophysics). More information about the three summative evaluation studies and the methods they employed can be found in the accompanying reports on nisenet.org/evaluation/summative-evaluation-reports.

Project deliverables



Explore Science: Earth & Space toolkits

comprised of engaging, hands-on Earth and space science experiences with connections to science, technology, and society.



Sun, Earth, Universe exhibition

offered engineering activities, games, and graphics that allowed visitors to engage in fun interactive Earth and space science experiences, while using skills essential to STEM learning.

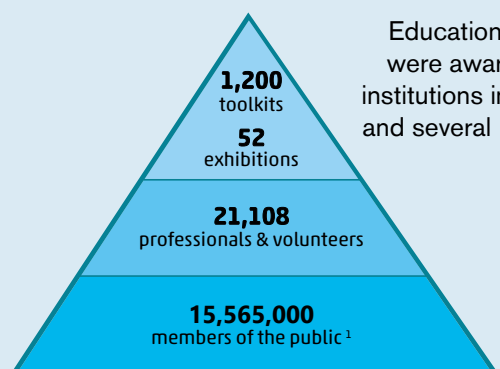


Professional development

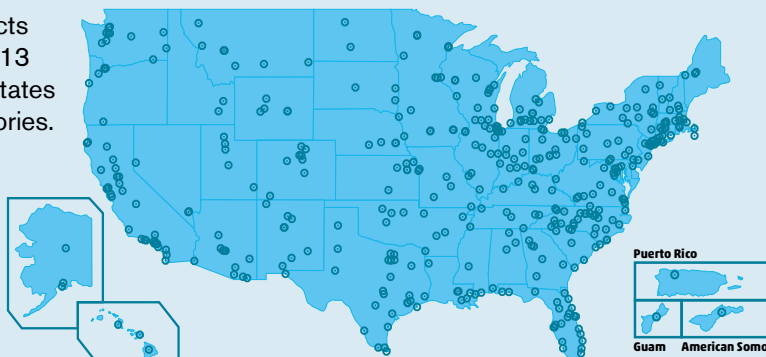
included 43 Online Workshops, an in-person Earth & Space Partner Meeting in 2019, as well as training resources and materials to help professionals engage the public.



By the end of 2020, the NISE Network SEISE project had reached millions of public participants and thousands of professionals in urban and rural areas.



Educational products were awarded to 513 institutions in all 50 states and several US territories.



¹Anderson, A. (2021). *Public reach estimates for the SEISE project*. Boston, MA: Museum of Science, Boston for the NISE Network.

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SEISE Project Professional Impacts Evaluation

The professional impacts evaluation was a longitudinal study focused on professionals' content understanding, use of SEISE products, public engagement practices, and partnerships with respect to Earth and space science. This executive summary highlights the main findings from surveys and interviews.

Knowledge of Earth and space topics and use of products

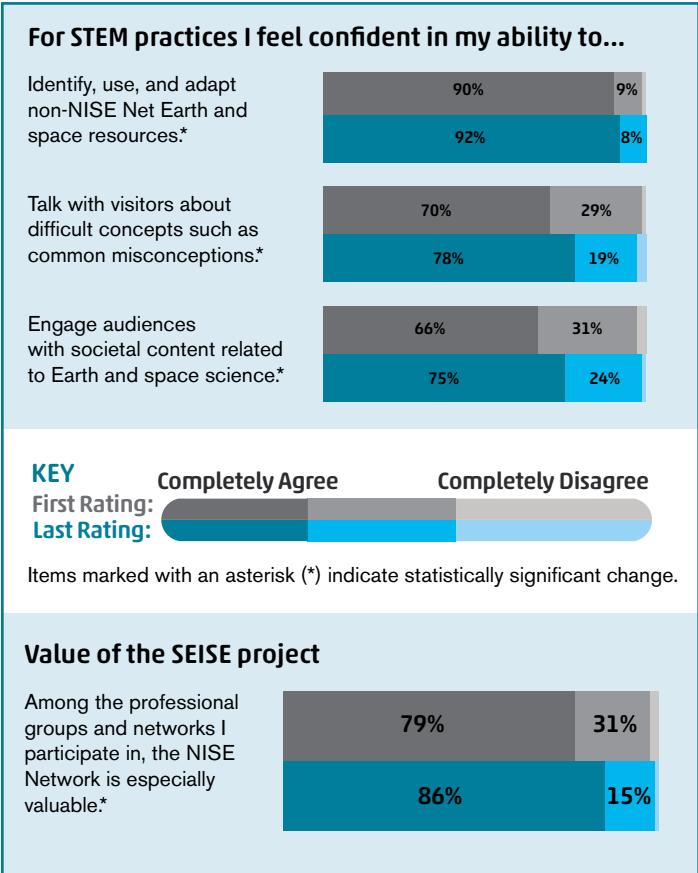


Professionals' confidence in facilitating the Earth and space content areas significantly increased with their involvement in the project and most reported using SEISE materials for presenting all content areas.

All partner institutions used their toolkit beyond the required event. Toolkits were most frequently used for brief table top activities and K-12 school outreach.

Impact on informal STEM practices and partnerships

The SEISE project has significantly increased partners' confidence in their ability to address societal content, discuss common misconceptions, and use non-NISE Network materials for Earth and space.



Professionals shared that the project helped enhance their Earth and space partnerships through activity materials and training resources.

“The biggest thing is being able to share that resource of how to actually interact with guests and share knowledge . . . being able to share that with our industry partners has just made it much easier for them to feel comfortable and confident being part of the program because it gives them that support and that piece that they can learn from.”
-a museum professional



“When I went to the conference in Phoenix that opened my eyes to the other ways that we could be expanding the use of the NISE kits and hearing what other people were doing really helps me come home and rethink how we can use ours.”
-a museum professional

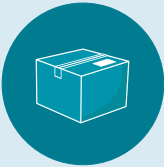
Value of the SEISE project to professionals

Overall, professionals valued the opportunities offered by the project and showed significant growth in being able to meet, learn from, or share with others.

SEISE Project Public Impacts Evaluations

The public impacts evaluations focused on how SEISE educational products may have changed the public's understanding of NASA SMD content areas, as well as the relevance and interest of space and Earth topics. The summative evaluation studies also focused on how engaging the experiences were for families and explored how experiences may have supported the development of positive science identities. This executive summary highlights main findings from surveys, interviews, and observations.

Engagement with Earth and space products



Explore Science:
Earth & Space toolkits

96% of adults
reported **high levels**
of enjoyment

86% of children
reported **high levels**
of enjoyment

95% of adults
reported **high**
levels of interest

91% of adults
reported that their group
learned something new



Sun, Earth, Universe
exhibition

89% of adults
reported **high levels**
of enjoyment

73% of children
reported **high levels**
of enjoyment

90% of adults
reported **high**
levels of interest

80% of adults
reported that their group
learned something new



5½ min.
average
dwell time

Visitors spent a lot of time in this small footprint exhibition. This dwell time is favorable when compared to other studies of exhibitions across the country, suggesting that visitors were more likely engaged in learning behaviors and had a more in-depth visit.¹



Increased interest in Earth and space topics



Explore Science:
Earth & Space toolkits



85% of groups
reported **increased**
interest



61% of children
reported **increased**
curiosity



Sun, Earth, Universe
exhibition



63% of groups
reported **increased**
interest



61% of children
reported **increased**
curiosity



What visitors had to say about the toolkit...

"[My child is] more interested in the topics now and having lots of fun."

- an adult

"We are programmed to think of living things on Earth, like plants, but don't think about non-living things. Seeing these [activities] made me think more - not just about living things - but the whole [planet]."

- an adult

¹Serrell, B. 1998. *Paying Attention: Visitors and Museum Exhibitions*. Washington, DC: American Association of Museums.

Confidence talking about Earth and space

Visitors reported a statistically significant increase in how confident they felt sharing about specific Earth and space topics (Earth science, heliophysics, planetary science, astrophysics, and their social dimensions) after trying the products.



Relevance of Earth and space content



72% of adults reported that they found Earth and space topics **more relevant to their daily lives after trying the activities**

What visitors had to say about the toolkit...

“The sand [in this activity] reminds me of the sandbox at our old house.”
- a child using “Exploring the Solar System: Craters”



56% of adults reported that visiting the exhibition **made Earth and space topics seem more relevant**

What visitors had to say about the exhibition...

“I have always been curious about the scientific instrumentation carried on board the various spacecraft, which have explored the planets of our solar system. The exhibit covering the sensors of UV, IR, and magnetic fields was very interesting.”
- an adult

Science identities

The hands-on toolkit activities and the exhibition supported positive science identities. Many children and adults reported that they were able to do something hands-on to learn more, work with others, choose ideas to explore, look at something closely, play and use their imagination, and share a discovery - all activities that overlap with doing science in the real world.

When asked, visitors shared ways that these experiences helped them feel like someone who could do or learn about science.



What visitors had to say about the toolkit...

“They helped me understand a bit better what scientists do. I can do science. Other scientists go to the moon and bring rocks from the moon.”
- a child



“I feel like opening kids and especially [my] daughters to science is really important. The fact that those experiences apply to all ages; everybody at the table is learning something.”
- an adult