



# The Directorate for Education and Human Resources: Perspectives on Informal Science Education

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Office of Polar Programs Advisory Committee

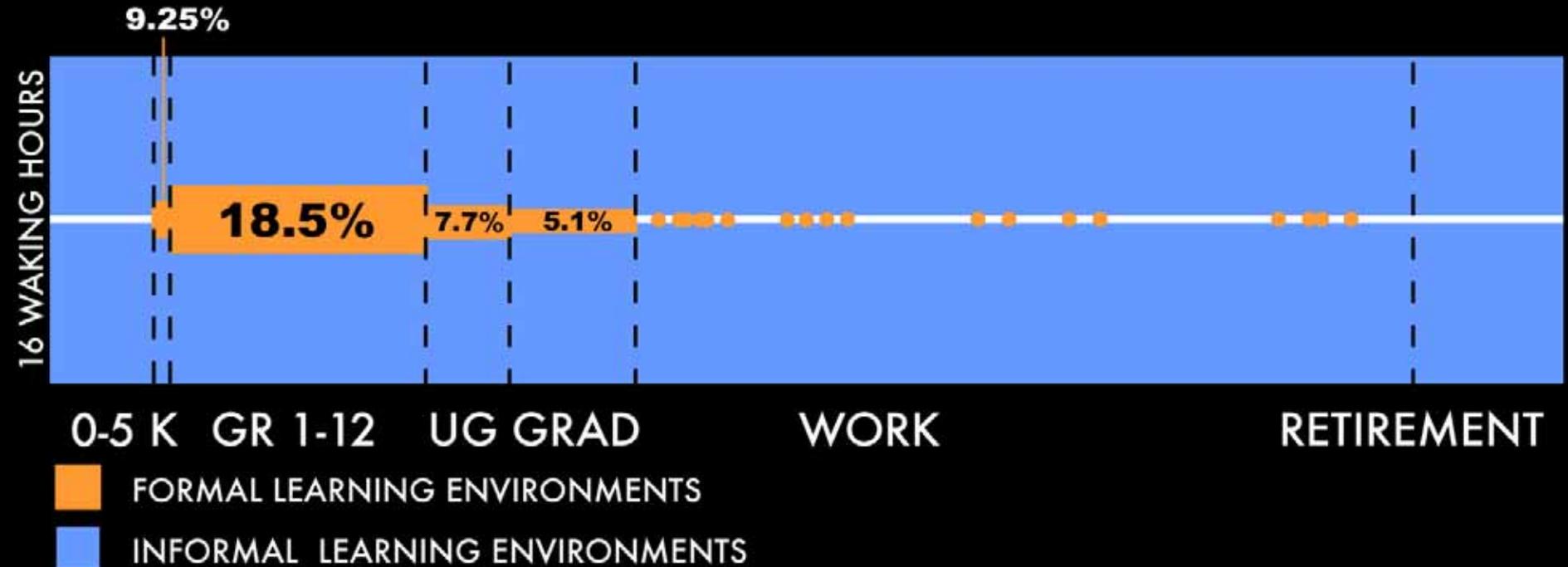
May 18, 2011







# LIFELONG AND LIFEWIDE LEARNING



**Life-Deep Learning** embraces religious, moral, ethnical, and social values that guide what people believe, how they act, and how they judge themselves and others. Learning, development, and education are deeply grounded in value systems operating in society—frequently in implicit ways.

Source: Stevens, R. & Bransford, J. in Banks, et al., *Learning In and Out of School in Diverse Environments*, 2007.

# Informal Science Education Program

Directorate for Education and Human Resources

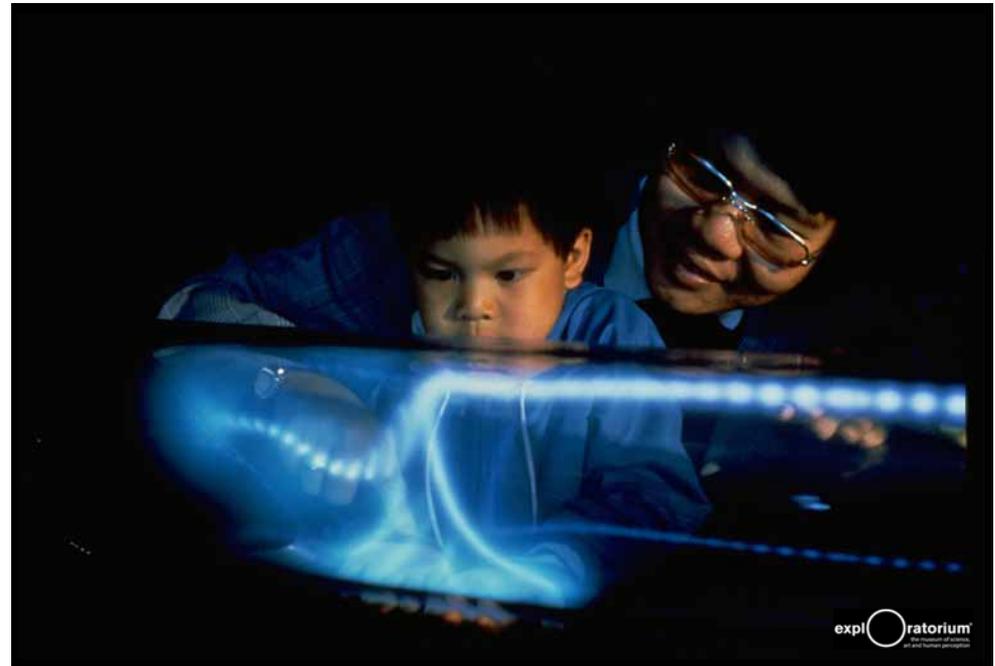
**Preliminary Proposals Due Date (optional):** August 12, 2011

**Full Proposal Deadline:** January 11, 2012

**ISE Solicitation, NSF 11-546**

**ISE Guidelines (NSF 11-546):**

[http://www.nsf.gov/publications/pub\\_summ.jsp?WT.zpims\\_id=5361&ods\\_key=nsf11546](http://www.nsf.gov/publications/pub_summ.jsp?WT.zpims_id=5361&ods_key=nsf11546)



# ISE Program Overview

*Supports innovation in anywhere, anytime, lifelong learning through investments in research, development, infrastructure, and capacity-building for STEM learning outside formal school settings.*



## **ISE Audiences**

Public Audiences

Professional Audiences



# The ISE program seeks to advance **research by**

- building the theoretical and empirical foundations for effective informal STEM learning
- furthering the assessment of such learning,
- supporting the use of innovative methods to address questions of importance to those who work in informal science education settings.



A young boy identifies the points of "compression" in his Jell-O building.

Credit: Chicago Children's Museum

The ISE program invests in the **design and development of models, resources, and programs for STEM learning throughout the lifespan.**

Visitors wearing 3-D glasses take a flight around the Lake Tahoe watershed and into the lake's bathymetry to learn about the geology, physical processes, and environmental impacts.

Credit: Jim Markle, UC Davis Tahoe Environmental Research Center





Minnesota Master Naturalists educate the public about the state's natural resources, such as birds of the forest.

Credit: Rob Blair, University of Minnesota

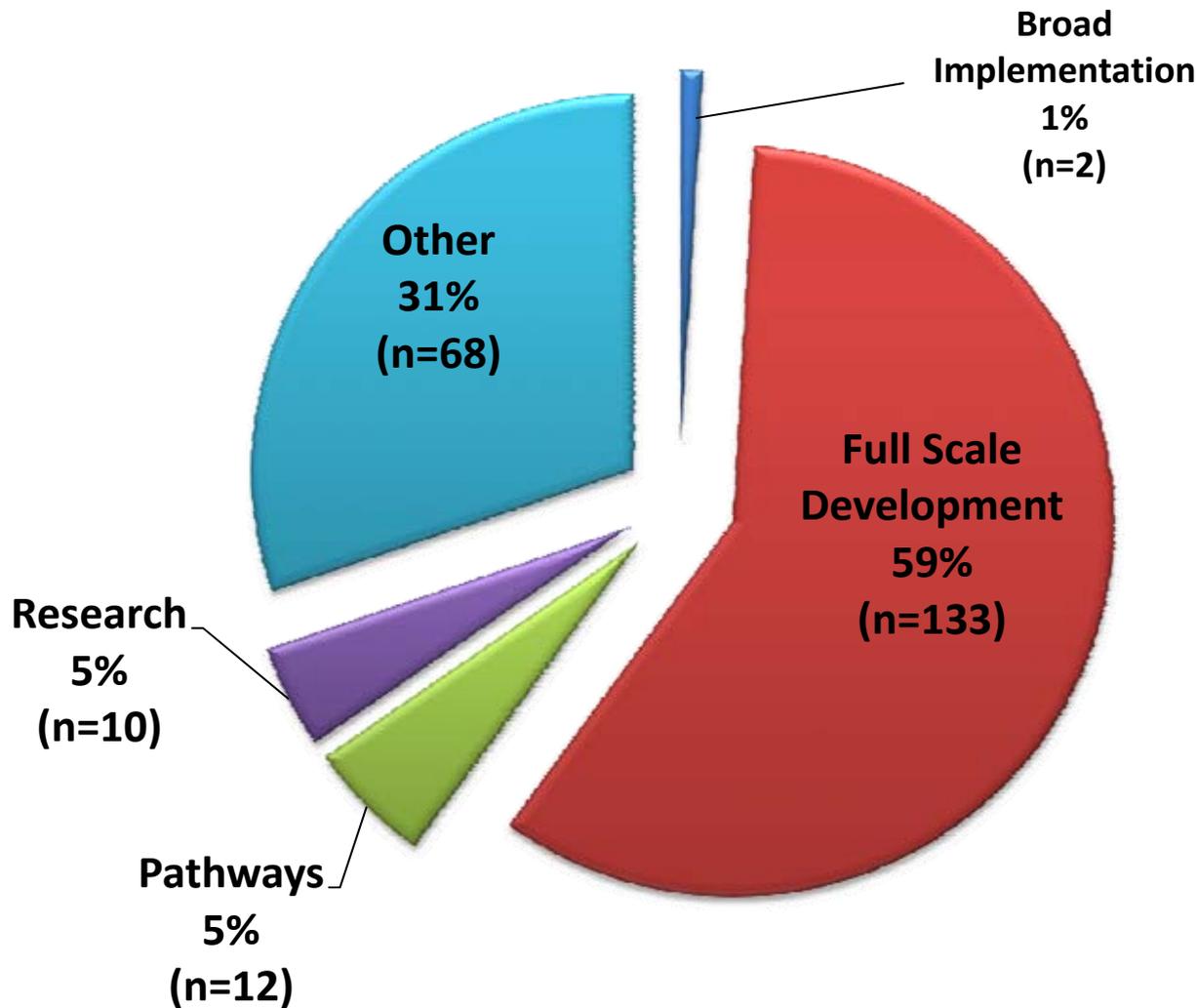
The ISE program seeks to **build the STEM and education expertise of informal science education's broad community of professionals, volunteers, parents and caregivers, and all those with potential to facilitate the learning of others.**



# ISE tracks:

- **Research** - advance knowledge in the informal STEM learning field
- **Connecting Researchers and Public Audiences** - opportunity for NSF-funded researchers to share key features of their research with diverse audiences
- **Pathways** - innovative work that is on a path toward a major ISE project
- **Full-Scale Development** - generate, develop and fully implement the an innovative concept, and evaluate its effectiveness
- **Broad Implementation** - broaden the reach of products or programs that have demonstrated success

# Active ISE Award By Award Type



Currently **225** projects are supported by the ISE Program Across NSF

FY 2012

Budget Request:

**\$68.14 million**

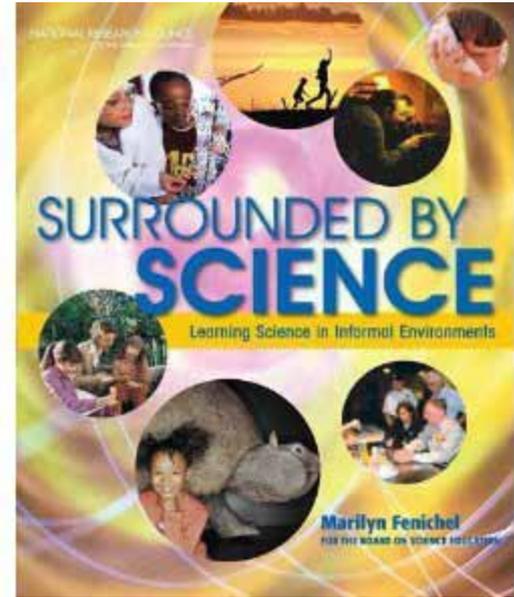


## Researchers Play Catch-Up in Gauging Beyond-School Effects

“What's measured in the classroom—what students know and can do—differs from what's currently measured outside—such as motivation and interest

Emerging research shows the science school-age children learn in informal settings—from museums and clubs to online communities and television shows—can have a big impact on their lives. Yet the open format and distinct structures of informal science make it next to impossible for researchers to evaluate the quality of those experiences in the same way they can gauge formal schooling.”

“In the course of daily life, virtually everyone engages in informal science learning. In fact, despite the widespread belief that schools are responsible for addressing the scientific knowledge needs of society, the reality is that schools cannot act alone.”



“There is abundant evidence that across all venues – everyday experiences, designed settings, and programs – individuals of all ages learn science.”

*Surrounded by Science:  
Learning Science in Informal  
Environments*  
NRC 2010



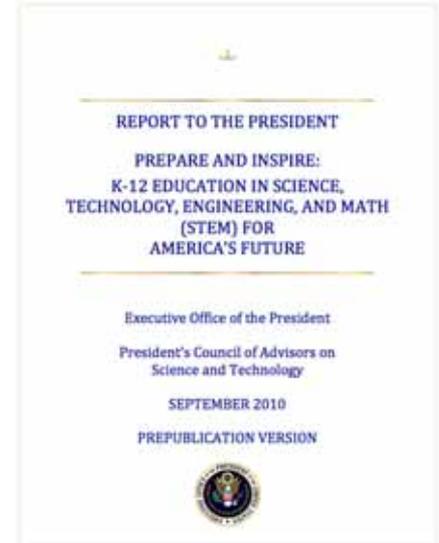
# America Competes Reauthorization Act

- Partnerships for Innovation
- Technology Transfer and Commercialization of Research
- Support of Post-Doc research in fields with commercial applications

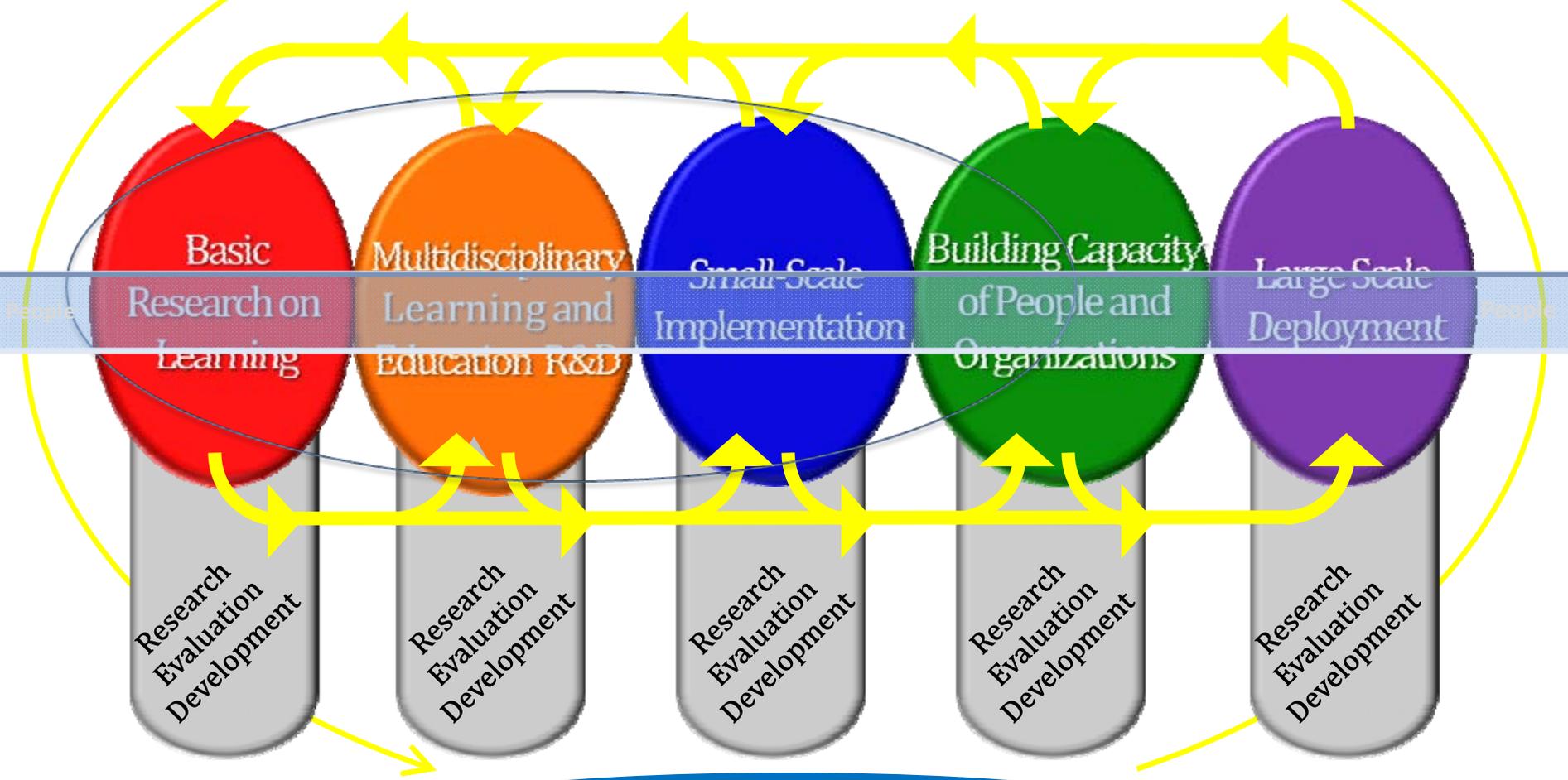
# PCAST: “Prepare and Inspire”

“Inspiration involves capturing the curiosity and imagination of students. Students need exciting experiences that speak to their interests – in school among teachers, peers, and mentors, **beyond the curriculum, and beyond the classroom.**

These experiences should reveal to them the satisfaction of **solving** a problem, **discovering** a pattern or phenomenon on one’s own, becoming **insatiably curious** about a puzzling question, or **designing** and **creating** an invention.”



Knowledge and Experience



Knowledge and Innovation

# Inspiring STEM Learning



Putting the STEM in  
STEM Education