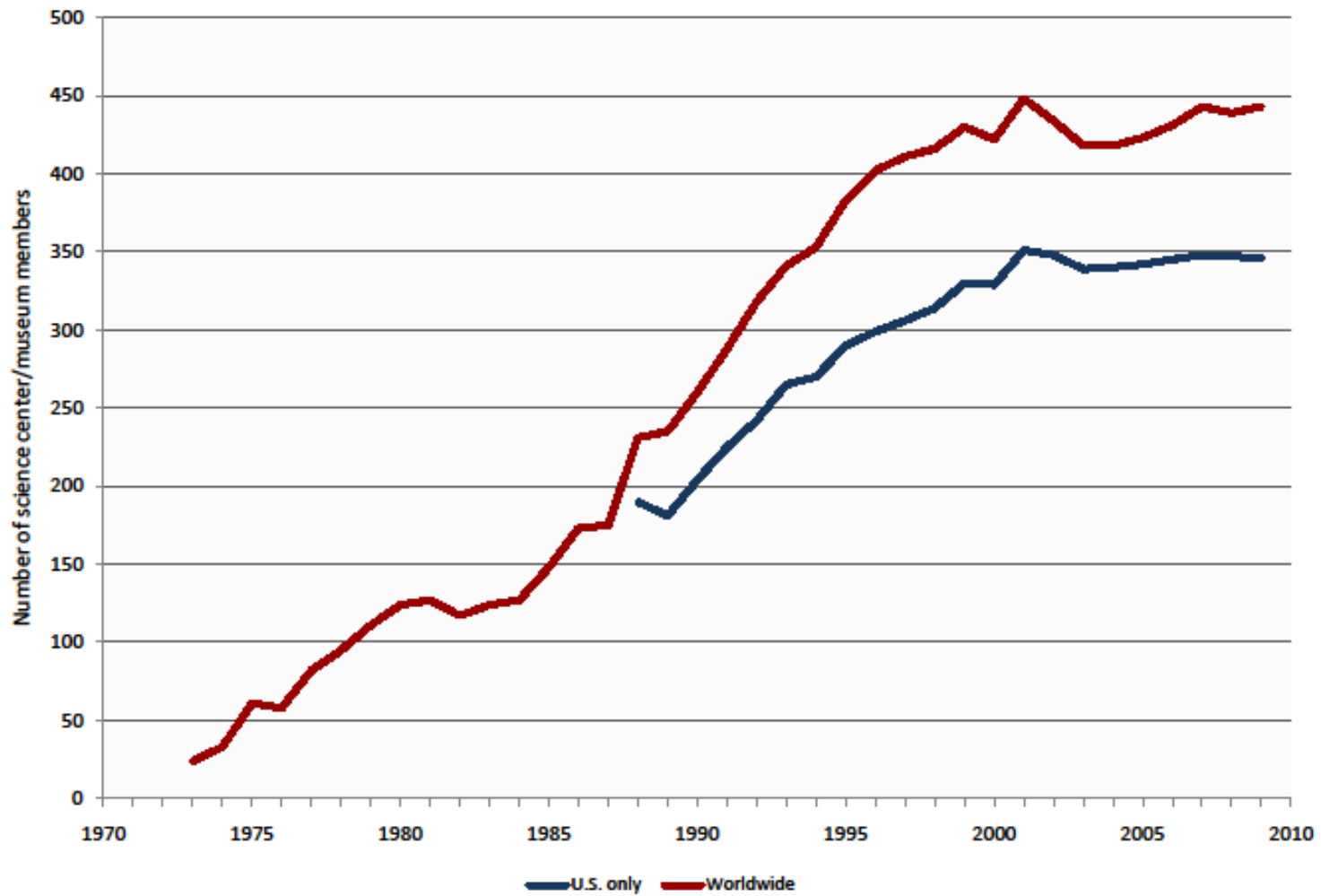


A young girl with blonde hair is shown in profile, looking through a magnifying glass. The background is a vibrant, abstract pattern of colorful, vertical lines in shades of blue, green, and red, resembling a digital or scientific visualization. The magnifying glass is held over the right side of the image, focusing on the colorful pattern.

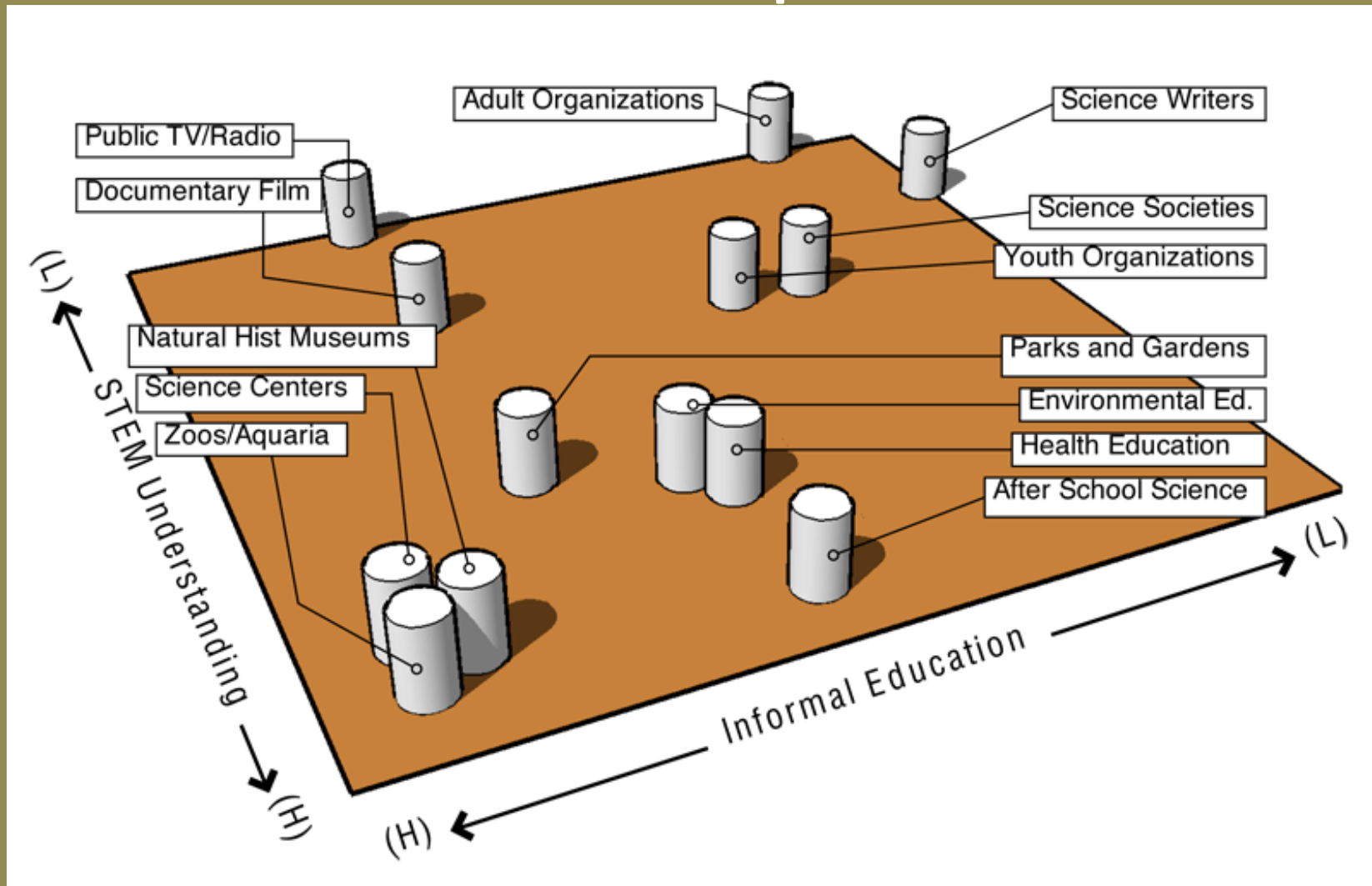
NSF Influence on Informal Science Education

David Ucko

Growth of ASTC science center/museum membership, 1973–2009



Landscape



Falk, Randol, & Dierking, 2008

Education at NSF

- National Science Foundation Act of 1950
- Public Understanding of Science (1957)
- Informal Science Education (1983)
- Directorate for Education & Human Resources

Least-Visited Science Museum Exhibits

Sheep Diseases Of The World

(Houston Museum Of Natural Science)

The Slide-Through Urinary Tract

(Boston Museum Of Science)

Armour Presents: Hands-On Historic Sausage-Filling

(Boise Children's Museum)

"Sounds Of The Prairie" Locked Isolation Chamber

(Oklahoma Museum Of Science And Industry)

Tooth Decay: An IMAX Presentation

(New York Hall Of Science)

Source: *The Onion*



Exhibitions

- Maryland Science Center (1959)
- Exploratorium (1972)
- Global Climate Change (1990)
- Whodunit? (1992)
- ~50% of exhibitions toured by ASTC
- Lion's Mane (2003)
- Extreme Zone (2004)
- Children's Library Discovery Center (2005)

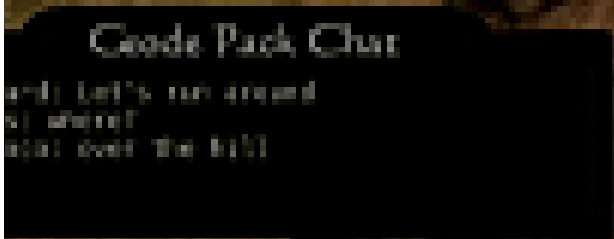
Media

- Nova (1974)
- 3-2-1 Contact (1977)
- NPR Science Desk, Star Date (1978)
- Square One TV (1987)
- Walking on Water (1987)
- Bill Nye the Science Guy (1992)
- Cosmic Voyage, Tropical Rainforest (1991)



Technology

- Demystifying Science (1981)
- Hands-On Universe (1995)
- Electronic Guidebook (1999)
- Accidental Scientist (2001)
- Science Now Science Everywhere (2006)
- WolfQuest (2006)



Programs

- Integrated Community Science/Arts Program (1975)
- Glass (1977)
- Mass Media Science Fellows (1980)
- Girl Scout Leader Training Program (1987)
- Playtime is Science (1992)
- Community Science Workshops (1995)
- MAPPS (1999)

Public Participation in Science

- Public Participation in Ornithology (1992)
- ~20 “citizen science” projects
- Citizen Science Central (2006)
 - Birds, mammals, invertebrates, plants, invasive species, water & air quality, weather, climate change, astronomy

Evaluation

- Formative evaluation (early 1990s)
- Summative evaluations (late 1990s)
- Informalscience.org (2002)
- Framework for Evaluating Impacts of Informal Science Education Projects (2008)

Research



- Early projects
- Informal Science Learning: What Research Says...(1992)
- Museum Learning Collaborative (1996)
- Informalscience.org (2002)
- Learning Science in Informal Environments (2009)

Learning strands

- 1. **Developing interest in science**
- 2. Understanding science knowledge
- 3. Engaging in scientific reasoning
- 4. Reflecting on science
- 5. Engaging in scientific practice
- 6. **Identifying with the scientific enterprise**

National Research Council, 2009

Collaboration

- Science Museum Exhibit Collaborative (1983)
- Science Carnival Consortia (1991)
- Magic School Bus Collaborative (1993)
- TEAMS [Traveling Exhibits at Museums of Science] Collaborative (1996)
- PIE Network (2001)
- KQED Quest (2009)

Communities of Practice

- Informalscience.org (2002)
- Nanoscale Informal Science Education Network (2005)
- ExhibitFiles (2006)
- Center for Advancement of Informal Science Education (2007)

Tipping Point

- Professional journals
- Professional organizations
- Private foundations
- Federal government

Looking Forward

- Build on growing base of research + practice
- Strengthen informal learning infrastructure
- Lifelong learning ecosystem
- Any time, any place, anyone
- Continued transformation of field