An introduction to effective science communication

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Overview of introduction presentation

• What is the Integration and Application Network?
  – Who are we?
  – 3 Key areas: Report Cards, Integrated Assessment, Science Communication Training

• Science Communication
  – Bit of theory
  – Applications

• About this course
What is the Integration and Application Network?

IAN’s aim is to enable better communication to empower change.
Solving, not just studying environmental problems

STUDY
- Dispassionate
- Embrace complexity
- Publish & funding via peer review
- Getting it right

SOLVE
- Passionate
- Simplify
- Publish & funding via stakeholders
- Getting it done

ian.umces.edu
IAN is making a global impact
IAN’s is creating a global symbol language

236 Countries

2604 symbols
IAN has three main focus areas

Develop Science Communication products

Environmental Report Cards

Science Communication Training
Objectives of this talk

- *Revisit* the long history of effective science communication

- *Provide* some overarching science communication principles

- *Establish* an underlying philosophy for science communication
The great scientists are/were also great communicators

“Finally when ... barrier-reefs ... atolls... and fringing-reefs ... are laid down on a map, they offer a grand and harmonious picture of the movements which the crust of the earth has undergone within a late period. We there see vast areas rising, with volcanic outbursts; and we may feel sure that the movement has been so slow as to have allowed the corals to grow up to the surface...”

The Structure and Distribution of Coral Reefs

"Make everything as simple as possible, but not simpler." A. Einstein
Paradigm shifts occur when scientific discovery is effectively communicated to society.
Principles of Analytical Design: Edward Tufte

• Integrate word, image, numbers
• Content-driven
• Presentation enables thinking
• Use small multiples (maximize content variation; minimize style variation)
• Know your content and audience
• Use humor and hyperbole

Bad science communication can be tragic
What is science communication?

- Successful dissemination of knowledge to a wide range of audiences (science and non-science)

- You are not doing anything if nobody knows about it
Science communication is a balance of quality science and communication.
Employing different communication techniques

**Scientific writing**

- Providing scientific context (references)
- Text > graphics
- Authorship exclusive
- Focus on results & interpretation

**Science communication**

- Providing societal context (examples)
- Text ≈ graphics
- Authorship inclusive
- Focus on conclusions & recommendations
Good science communication can make you a better scientist

Completeness
Envisioning the ‘story’ can lead to comprehensive research program

Context
Identifying the linkages and developing comparisons can provide important insights

Visualizations
Combining visual elements can lead to new insights

Synthesis
Combining and comparing different data sets or approaches can lead to insights
Synthesizing information for less technical audiences

Synthesis

Interpreted & synthesized data

Visualization

Sense of place: who, what, where, when, how & so that you can tell them why

Context

So what?
John Snow’s 1854 cholera map

- Cholera outbreak in London
- John Snow mapped cholera cases
- Linked cholera cases to pump locations
- Pump handle removed; cholera subsided
The ‘zen’ of science communication

• *Enthusiasm* counts: get excited

• *Quality time* needed: schedule it

• *Feedback & revision* essential: seek it out
The art of science communication

- Conceptual diagrams: context and synthesis
- Maps: geographic context and information-rich
- Photos: describe methods, study site description, processes and relevance
- Video clips: capture system dynamics
- Tables and figures: scientific data
Developing a variety of science communication products

Newsletters
Science Journals
Posters
Reports
Books
**Invest in science communication**

- Building a library of high quality visual elements is an investment that will pay dividends over time.
- High quality visual elements can be recycled for various media.
- Good science communication ...
  - Helps convey information
  - Helps make a good impression on your audience
  - Helps make a difference
About this course

- We want you to succeed and become better science communicators
- Previous courses have created long-term collaborations, stimulated excellent science communication products
- We like teaching this course and hope that you both learn a lot and have an enjoyable experience