



Optimizing science communication between scientists and natural resource managers - from project inception to completion

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Greater Everglades Priority Ecosystems Science (GEPES) Program

- One of five PES programs in country
- Provides money for critical Everglades science efforts
- Presently funded at almost \$6 million
- Projects led by USGS researchers from across the country
- Most projects are multi-year
- Provides independent but management-relevant science for restoration
- *Its success depends on effective science communication*

Why is effective science communication important?

“When scientists are able to communicate effectively beyond their peers to broader, non-scientist audiences, it builds support for science, promotes understanding of its wider relevance to society, and encourages more informed decision-making at all levels, from government to communities to individuals. It can also make science accessible to audiences that traditionally have been excluded from the process of science. It can help make science more diverse and inclusive.”

Why should we care about effectively communicating Everglades science?

- International Biosphere Reserve (1976)
- UNESCO World Heritage Site (1979)
- Wetland of International Importance (1987)
- Ecologically rich and unique globally
- Important for human health and well-being
- Provides many ecological services – flood buffer, water storage, groundwater recharge, water cleansing, shoreline stabilization and storm protection, biodiversity
- And, because we just should!

Five keys to effective science communication

1) Include decision-makers from the beginning, as science efforts are first conceptualized



2) Involve decision-makers in a meaningful way at regular intervals throughout the scientific process

- UCAR PACE Fellowship
- Post-doc required to spend 50% of time in academic environment, 50% of time in decision-making environment
- Scheduled monthly calls with participants; evolved into steering group for research
- Meetings ensured research was addressing management needs
- Some participants became meaningful coauthors on scientific papers
- All of this required regular and significant time commitments

3) Continual learning by both scientists and decision-makers to improve communication skills and techniques, including professional training

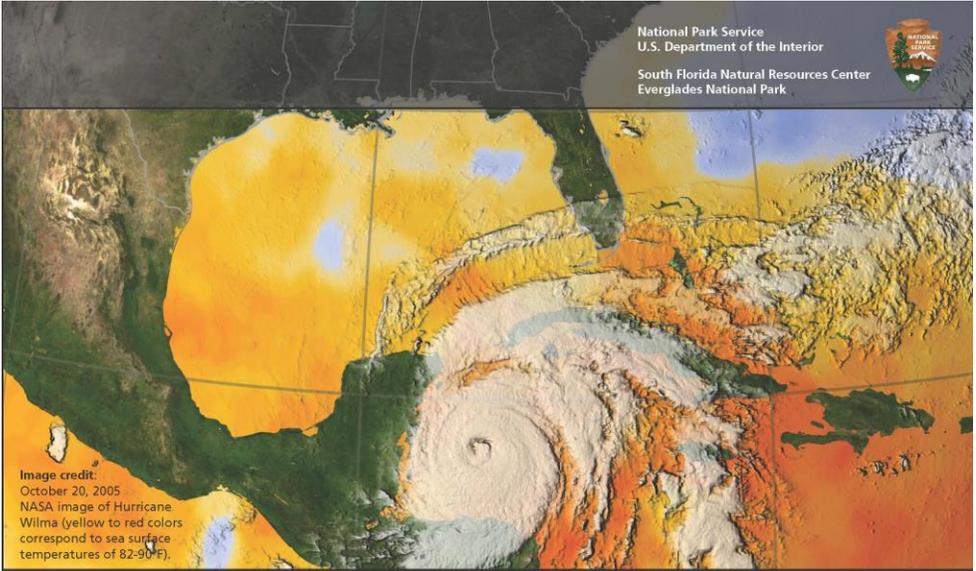
- Example of what took place yesterday with the three communication workshops.
- Creating powerful powerpoint; Designing and delivering a TED talk; The secrets of dynamic delivery (Jezra Kaye; speakupforsuccess.com)
- Consider professional training of scientists in communication and inclusion of it in graduate programs

4) Recognition that successful communication entails a significant investment of time and effort

- Has to be important enough to be part of individual development plans and performance evaluations
- Incentives in academia for promotion and tenure
- Metrics of success

5) Dedicating sufficient time, financial, and human resources to science communication

Everglades National Park's South Florida Natural Resources Center incorporated science communications as a branch, and led to the development of a number of significant outreach publications



National Park Service
U.S. Department of the Interior
South Florida Natural Resources Center
Everglades National Park

Image credit:
October 20, 2005
NASA image of Hurricane
Wilma (yellow to red colors
correspond to sea surface
temperatures of 82-90°F).

CLIMATE CHANGE AND SOUTH FLORIDA'S NATIONAL PARKS

...portrait of a changing landscape

The 2005 hurricane season produced several powerful storms fueled by abnormally-warm ocean waters. Hurricane Wilma – the strongest Atlantic storm ever recorded – was one of four major hurricanes to strike Florida that year. For days, this Category 5 cyclone sat off the coast of the Yucatán Peninsula, pounding the region with record-setting 185-mph winds. By the time Wilma made landfall over Florida, its fierce winds had quelled to 120 mph – still strong enough to topple trees and rip off roofs. In total, 62 deaths and \$16- to \$20-billion in damages were blamed on this storm.

Some scientists predict that intense storms like Wilma – which strengthen over warm water – will be more common in the future as a result of rising temperatures. Research has documented an unprecedented rise in atmospheric carbon dioxide (CO₂) and near-land air and sea surface temperatures. But while hurricanes receive much attention, sea level rise is another anticipated consequence of rising temperatures – one that may have dramatic ecological impacts on coastal areas worldwide. South Florida, in particular, will be affected by sea level rise due to its low elevation and flat landscape.

Although it is important to consider the impact of climate change on developed areas, effects of this phenomenon on the natural environment also deserve attention. As stewards of some of south Florida's most unique natural areas, Everglades, Biscayne, and Dry Tortugas National Parks and Big Cypress National Preserve play an important role in conservation. Together, they protect over 2.4 million acres of habitat and harbor more than 14 endangered species. While scientists remain uncertain about how the effects of climate change will manifest, their research suggests that low-lying south Florida and its extraordinary ecosystems are vulnerable.

Preparing for a future with climate change

- What are scientists predicting?
- How will ecosystems respond?
- What is the National Park Service doing?

Conclusions

- As scientists, we should avoid the assumption that we know best what managers need from us
- The co-production of the science effort between scientists and end-users is essential
- We all can benefit from some level of professional training in science communication



Questions?