International Collaborations: Lessons Learned from the Atmospheric Sciences

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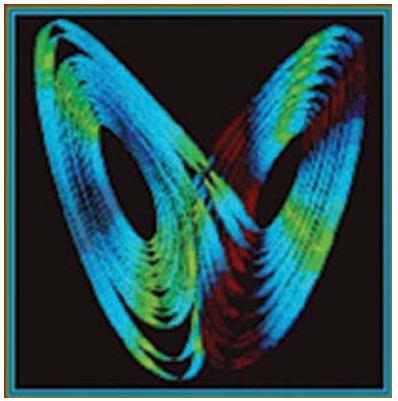
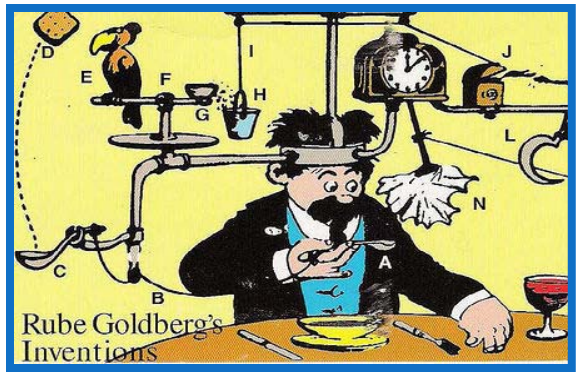
The Problem

- Goal: Provide benefits to society of earth science research and observations
- Operational services and decision support needs and culture different than research needs and culture
- Earth science needs to study a complex system of interacting systems
- Traditional science is focused on the parts
- Data is scattered all around, in wildly different formats, (unintentionally) inaccessible to most and often not sustainable
- Interactions amongst different systems are difficult to see
- Interaction amongst different disciplines is rare and difficult
- Traditional institutional and geographical boundaries inhibit sustained interaction

The Sun & Earth (Land, Atmosphere, Ocean) Form a Complex System Which Has Characteristic Properties

- Prediction is difficult based on knowledge of components alone
- History matters
- Emergent features
- Negative and positive feedbacks





Atmosphere

- Knows no boundaries; global culture
- No resource extraction or use
- Physical, chemical environment
- Promotion of science justified by provision of services
- Service need requires global sustained observations
- Benefit well articulated and documented
- Variety of platforms, sensors; long history of routine measurements; well identified national ownership

Ocean

- One ocean, many basins, nation borders
- Many resources extracted or used
- Ocean life intimately linked to environment
- Promotion of science driven mainly by exploration, scientific understanding of processes
- Service need diffuse; not clarified
- Benefit difficult to justify to stakeholders
- Variety of platforms, sensors; just beginning networked observations; diverse ownership

WMO provides international operational framework

- WMO is far from a perfect organization, but it has been, and is, fairly effective
- Permanent representatives are typically heads of the hydrometeorological services in their countries
- Data are shared for operational purposes
- Observing guidelines and standards are established
- Observing system intercomparisons are performed
- Optimize operational observing resources and data
- Open data policy in the U.S. has created vibrant and robust private sector that provides complementary services to those of the public sector
- Operational observing system provides backbone for research that is sustainable; research doesn't pay for this backbone

While services are context, international science essential for evolution of services and applications

- Grand challenge questions that require international collaboration; role of cyberinfrastructure in addressing systems science
- International science planning important for developing new resources
- ICSU scientific committees
- IPCC- Does it really set stage for international science?
- WCRP – Next generation of programs?
- New integrated observational capabilities and data that improve prediction and knowledge products; development of informatics
- AMS facilitating interaction with WMO, other professional societies

What can POGO do?

- Help define and clarify initial focus and objectives for global ocean networks and data information systems; identify what is ready
- Focus on benefit areas (products); clear understanding of public value/need
- Effectively partner with other international organizations (e.g., WMO, WCRP, SCOR, GOOS/GEO). Large challenge.
- Develop next generation of international science plans (with WCRP, IGBP, SCOR, SCAR)
- Determine and advocate framework for international operational observing system collaboration
- Determine and advocate role for cyberinfrastructure in science, observing systems, and decision-support
- Next POGO meeting: focus on synthesis of OceanObs09?