

D R A G O N

I nternational D elta Roundtable
L afayette, L A
N ovember 28-30, 2007

Russ Hall, USGS Scientist Emeritus

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P.O. Box 357305
Gainesville, FL 32625-7305





**"A rt is me
Science is we"**

Claude Bernard



pro·voca·teur·

(prə vək'ə tʃr', prōvəkətʃr)

a writer, artist, political activist, etc.
whose works, ideas, or activities are
regarded as a threat to accepted
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My role is to challenge you



What are the outcomes of DRAGON I,
the first International Delta Roundtable?

And

How will they help us better practice
science to serve the public interest?

Rationale for DRAGON



1. Government leaders worldwide face decisions that will determine the future of river deltas and the services they provide to mankind
2. The right decisions will depend on the most appropriate and best possible science being available to decision-makers
3. A large and growing body of knowledge can help inform effective policies and actions
4. This knowledge is fragmented, however, with key developments and insights not shared across boundaries of space, time and nationality
5. The DRAGON network can facilitate sharing and lead to an international community of practice that transcends political and geographic barriers



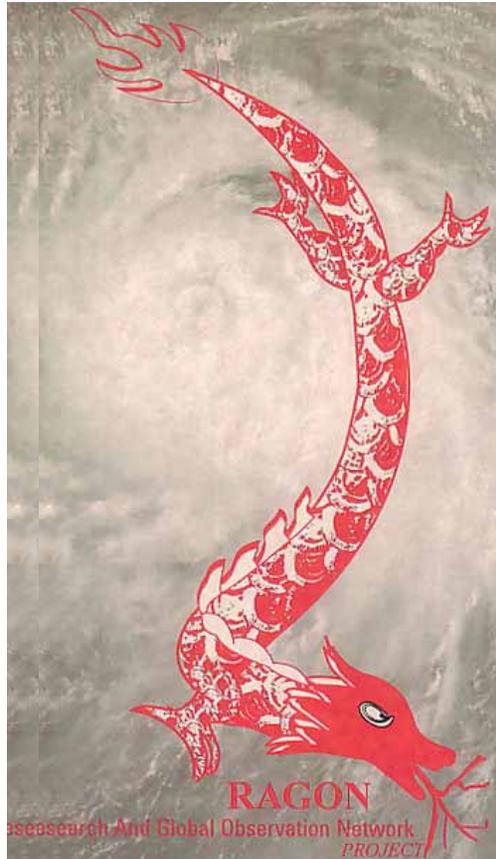
Question #1:

How are we doing in fulfilling our promise?



Question #2:

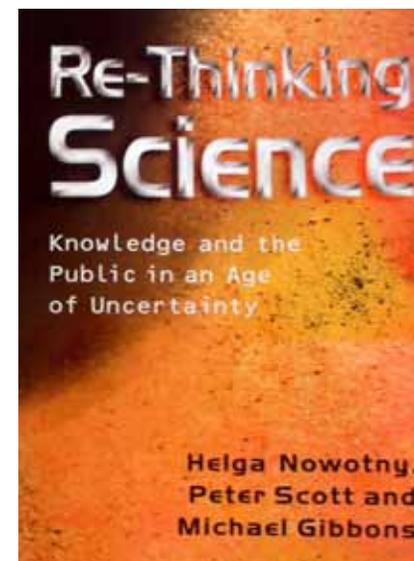
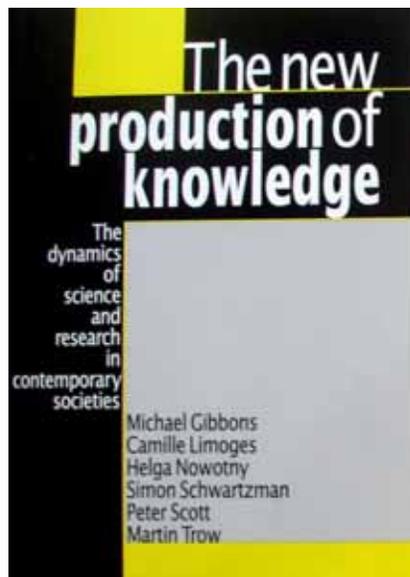
How are we doing as Mode 2 Scientists?



Follow-up to Question #2:

What do you mean, "Mode 2 Scientists"?

Some Scholars Recognize Two Modes of Science Practice





The "old" science they call Mode 1, while the newer variety is dubbed Mode 2

Both modes exist side by side, but Mode 2 has become increasingly important in public life

Although they may not know many people, and most of the scientists in this room are Mode 2 scientists

Mode 1 Science



Is largely practiced in universities

Seeks to understand fundamental truths about nature

Is organized along strict disciplinary lines

Uses the scientific disciplines as agents for quality assurance and control; they establish normative criteria, and review and adjudicate methods and practices

Distances itself from society and societal concerns in order to maintain objectivity*

Mode 2 Science



Is practiced in government laboratories, some university departments, and corporate research units

Its goal is developing needed products—i.e. knowledge generated is intended for use

Is trans-disciplinary

Lacks the rigid quality-control mechanisms that regulate the traditional scientific disciplines

Is engaged with society and addresses societal concerns

Mode 1 Science



The Ivory Tower.

Mode 2 Science



The Trading Zone

Review: The Contrasting Characteristics of Mode 1 and Mode 2 Science

Disengage from Society

Disciplinary Orthodoxy

Prefers Precise Questions

Seeks Fundamental Truths about Nature

Strict Quality Control

Emphasis on Reliability

MODE 1

MODE 2

Engage with Society

Trans-Disciplinarity

Addresses Complex Questions

Seeks Needed and Useful Information

Uneven Quality Control

Emphasis on Utility

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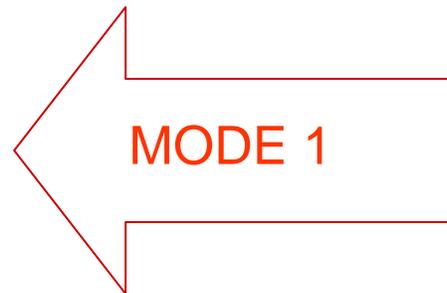
RAGO

Research And Global Observation Network

PROJECT

Review: The Contrasting Characteristics of Mode 1 and Mode 2 Science

Questions are identified and priorities assigned by the academic disciplines...



Issues are identified and priorities assigned by the public and its representatives...



Review: The Contrasting Characteristics of Mode 1 and Mode 2 Science

i.e.
scientists talking to
other scientists

MODE 1

MODE 2

i.e.
multiple stakeholders in
trading zones

How is DRAGON Doing in Mode 2?

Is our science practiced in government laboratories, some university departments, and corporate research units?

Yes. Presenters included:

Government scientists	37
University faculty	12
NGO	10
Government operational	4
Other	12



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Is our science practiced in government laboratories, some university departments, and corporate research units?

Yes. Presenters included:

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But perhaps the balance could be improved

How is DRAGON Doing in Mode 2?

Is the goal of our science developing needed products—i.e. knowledge we generate is intended for use?

Yes! Better understanding of delta systems is our immediate goal, but our clear ultimate goal is the use of that knowledge to produce benefits for society



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Yes! Better understanding of delta systems is our immediate goal, but our clear ultimate goal is the use of that knowledge to produce benefits for society

All participants seem highly motivated to in cause of preserving the values of delta systems

How is DRAGON Doing in Mode 2?



Is our science trans-disciplinary?

Yes. In the past two days I have heard from scholars and practitioners who represent a wide variety of scientific and non-science disciplines

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Yes. In the past two days I have heard from scholars and practitioners who represent a wide variety of scientific and non-science disciplines

However, session attendees on the whole seemed to segregate themselves in favoring sessions with more, or less technical themes

How is DRAGON Doing in Mode 2?

Are we addressing complex questions?

Yes! Questions arising in the quest for better stewardship of river deltas have physical, biological, economic, sociological, cultural, legal, and ethical dimensions



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Are we addressing complex questions?

Yes! Questions arising in the quest for better stewardship of river deltas have physical, biological, economic, sociological, cultural, legal, and ethical dimensions

Participants seemed well aware of the complexity of scientific issues and the myriad other issues that may confound simple solutions

How is DRAGON Doing in Mode 2?



Does our work lack the rigid quality-control mechanisms that regulate the traditional scientific disciplines?

Yes, quality control will likely be a problem.

How is DRAGON Doing in Mode 2?



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Yes, quality control will likely be a problem.

However, to the extent that quality control promotes orthodoxy, its lack may aid creativity

How is DRAGON Doing in Mode 2?



Are we engaged with society and addressing societal concerns?

Yes, we clearly are addressing societal concerns.

How is DRAGON Doing in Mode 2?



Are we engaged with society and addressing societal concerns?

Yes, we clearly are addressing societal concerns.

However engaging with society is a constant challenge, and we must always work to be more effectively engaged

Why Do We Need to Engage?



Suppose...

Someone proposes introducing a genetically-modified crop on a delta...

The Challenge

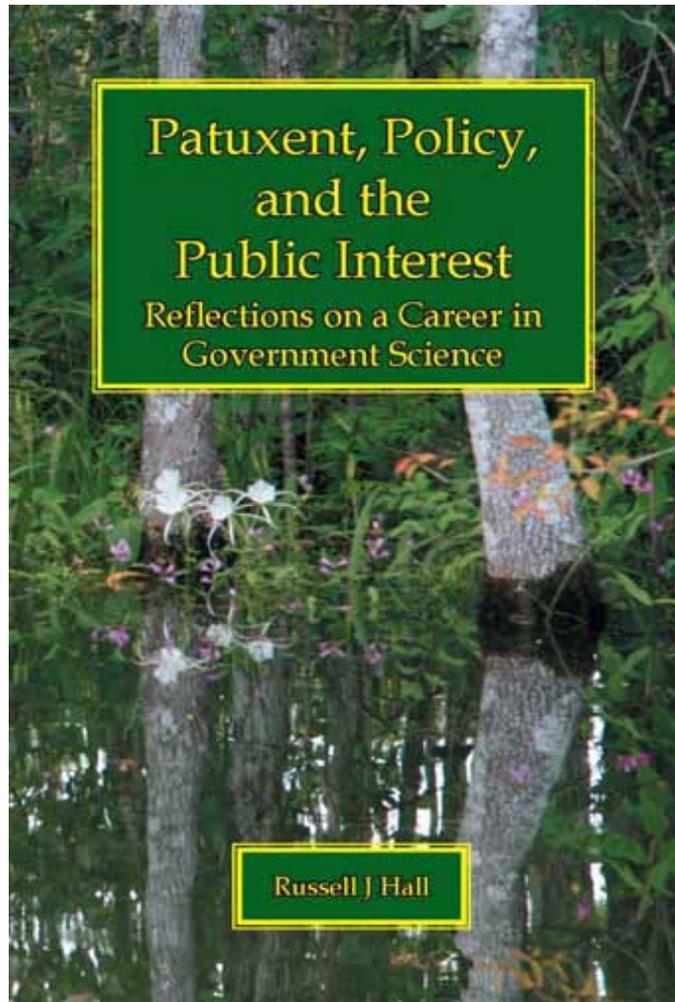


To keep up the Dragon - IDR initiatives,
building upon the foundation of this
excellent first step

While doing more, and doing it better



Want to know more about the evolving modes of science practice?



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