2020 Annual Public Meeting
Interagency Collaborative for Environmental Modeling and Monitoring

March 17 - 18, 2020

U.S. Geological Survey

Reston, VA

ICEMM March 17-18, 2020:

Background, Meeting Aims, Defining Poems

Presented by Pierre Glynn, U.S. Geological Survey,

Chair of the Interagency Collaborative for Environmental Modeling and Monitoring (ICEMM)

ICEMM Background

Formed July 2001 with participation from NRC, EPA, USACE, DOE, USGS, USDA, NOAA, USBR, NSF.

Run by Steering Committee. Yearly public meetings. Many important accomplishments and products (e.g. Laniak et al., 2013, Environmental Modeling & Software, Special Issue and "Integrated Modeling: Roadmap and Vision" article).

Four Workgroups:

- Integrated Monitoring & Modeling (Ming Zhu, DOE)
- Water Quality (Billy Johnson, USACE)
- Data Assimilation, Uncertainty Assessment and Environmental Model Confirmation (Tom Nicholson, NRC)
- Ecosystem Functions and Services (Ken Bagstad, USGS, Brenda Rashleigh, EPA, Pat Deliman, USACE)

April 2018 ICEMM Meeting Theme: Model and Data Fusion. Meeting report published in EOS.

See ICEMM Agency Mission Statements in separate presentation. We seek to get more agencies to join the ICEMM Memorandum of Understanding!

ICEMM Priorities & Directions

General Goals:

- Integrated Modeling and Monitoring
- Work with “Nature” and the “Built Environment”.
- Establish working partnerships, reduce redundancies, improve common technology
- Support development of models, tools, methodologies, and databases.
- Support applications and assessments of environmental modeling and monitoring

Specific Topics of Interest:

- Complex systems science and decision tools (e.g. structured decision making, systems of systems modeling)
- Integration of socio-economic modeling and approaches with bio-physical modeling
- Uncertainty & Unknown Unknowns
- Participatory Modeling
- Risk Assessments
- New Technologies:
  - Automating model assembly
  - Cloud-based data and models
  - Big data and data assimilation
  - Developing and using semantic models
- Use Cases

ICEMM 2020 Theme

Integrated Modeling, Monitoring, and Working with Nature

"Working with nature" includes ecosystem perspectives and understanding of natural processes, features, and conditions.

ICEMM 2020 Goals & Questions

1. *Advance knowledge of complex human interactions in natural systems and attendant environmental issues*

1.1 What progress are we achieving?

1.2. What are the new and innovative monitoring and modeling tools, datasets, methodologies that would benefit the integration that we are seeking?

2. *Describe how "working with nature" improves the integration of environmental models and monitoring programs important to addressing societal issues. (Or, vice versa).*

2.1 Progress in incorporating natural processes, features and conditions in our conceptual and numerical models, and in designing monitoring networks?

2.2 Explicit consideration of human processes and behaviors, and consequent natural responses?

2.3-2.4 What does "integration" mean? What does "working with nature" mean?

2.5 How to determine natural processes, features, conditions to include in models & monitoring programs?

ICEMM 2020 Goals & Questions

3. *Explore how data and models are, or could be, used for the risk-informed assessments and management of hazards, natural resources, environmental systems, and built infrastructure.*

3.1 How do you use data and models for risk-informed decision making and resilience management?

3.2 What are some examples of the use of integrated modeling and monitoring, and methodologies for tracking progress?

4. *Inform and implement "Integrated Modeling, Monitoring, and Working with Nature" into anticipatory, adaptive management approaches*.

4.1 What are the challenges and opportunities for this implementation?

4.2 Can you provide examples (or nascent approaches) of anticipatory, adaptive management?

4.3 How can ICEMM help explore these challenges and opportunities?

Poems & Memes for ICEMM 2020

Our data are sparse

Our models are incomplete

But, we must decide.

Haiku by Ty Ferre (U. of Arizona, 2016 Darcy Lecturer)

Mentioned in November 1, 2017 H2Onestly glass-earth.com blog by Pete Dupen (University Technology Sydney)

Most of the time...

Our models are incomplete,
Our data are sparse,
We are biased
To the past:
We decide,
Innately.

Pierre Glynn's adaptation of Ty Ferre's (2017) Haiku for ICEMM 2020 meeting. See Glynn (2014, 2017), Glynn et al. (2017, 2018), for related articles.

On the General Absence of People-Centered Policies

The Army Corps of Engineers
Insists on building Dams and Weirs,
The Reclamation men assume
That every desert ought to bloom.
The wildlife people often wish
That all the world were game and fish.
The conservationist's a whiz
At keeping nature as she is.
The church is measured by its steeple –
And no one gives a dam for people!

This poem by Prof. Ken Boulding was included by Harry Schwarz (USACE) in his presentation and paper for the 1968 conference of the American Water Resources Association in New York City.

Poem (1962, from "The Feather River Anthology or "Holy Water", Unpublished paper, University of California, Berkley, Water Resources Archives) by Prof. Kenneth Boulding (Economist, co-founder of General Systems Theory).

Last Words

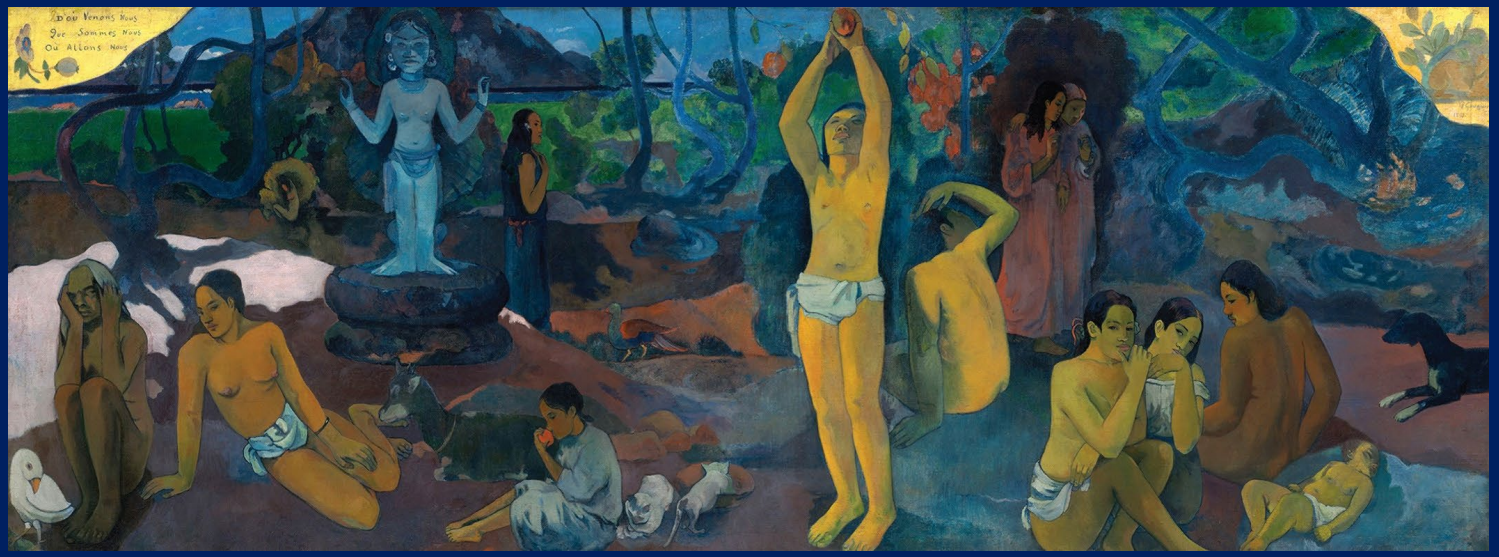
Learn & Move Past Technology Challenges

Seek Opportunities, Ask Questions

Participate, Engage

Follow-up…

Enjoy!



Paul Gauguin's 1897-1898 masterpiece (Boston Museum of Fine Arts) "Where do we come from, where are we, where are we going?" is discussed in Glynn et al. (2017, Earth's Future). See also Wikipedia article.