Team Science and Lessons from Kindergarten: Reflections on Collaborative Research

2021 Mitchell Center Sustainability Talk Series

Pips Veazey
Director, UMaine Portland Gateway
Kindergarten

1. Share everything.
2. Don't hit people.
3. Put things back where you found them.
4. Clean up your own mess.
5. Watch out for traffic, hold hands, and stick together.
6. Say you’re sorry when you hurt somebody.

Be aware of wonder.

Robert Fulghum, All I Really Need to Know I Learned in Kindergarten
Overview of presentation

• A little about Pips
• Team science
• Lessons learned from working with research teams
• Roles for future scientists
• UMaine Portland Gateway
Partners in the Sky

Tanana Chiefs Conference collaborates on aerial remote sensing

From the PI

Pina Varazy, Principal Investigator
Hello everyone,

It's mid-December, and it feels odd not to be at the temporary center of the science universe, the American Geophysical Union Fall Meeting. Instead of its usual San Francisco (or New Orleans or D.C.) venue, this year’s event has been entirely virtual. Researchers from across EPScoR have been presenting and exhibiting posters (here’s a list) and discovering the ups and downs of the virtual format – the most significant downside probably being all the presentations scheduled for three a.m. Alaska time!

Speaking of virtual meetings, we held our first EPScoR All-Zoom All-Hands Meeting November 4–5. The event went off without a hitch and more than 100 people attended to share in conversations and presentations.

COVID Challenges

Coastal Margins researchers cope with coronavirus restrictions

As Brenda Konar sees it, the masks and the social distancing are the easy part. The real challenges of conducting fieldwork during a pandemic, Konar says, lie in the endless stream of paperwork, the 12-hour drives from Fairbanks to Homer without being allowed to enter a building along the way, and—most onerous of all—the two weeks her research team has had to quarantine before every week-long research trip.

“There are about seven months a month that I’m either not in the field or not in quarantine,” said Konar, co-leader of the Coastal Margins component and head of intertidal and oceanic fieldwork in Kachemak Bay. “I feel like a true homebody right now.”

Konar and her research team aren’t the only Coastal Margins researchers who have had to drastically alter their research plans in the era of COVID. In Kachemak Bay and Lyn道 Canal, across river and estuarine-based research projects, scientists have had to make significant changes in order to continue their five-year project of data collection in the Gulf of Alaska nearshore and the rivers that feed it.

Continued on page 2

Continued on page 3

Studying Student Stewards

UAF class charts young children’s environmental engagement

How do children act as stewards of their environment?

That question was at the core of a recent UAF graduate course, “Children as Cultural Change Agents,” which received support from an Alaska NSF EPScoR Education and Outreach Seed Grant. Taught by UAF Associate Professor of Graduate Education and EPScoR affiliate Dr. Carrie Green, the class centered on participatory research projects engaging preschool, kindergarten, and high school students in the communities of Fairbanks, Kenai and Scammon Bay.

“The project is geared towards equipping educators to engage children in environmental stewardship,” explained Green. “At each site they facilitated participatory research methods that honor children’s voices and

Continued on page 2
PORTLAND GATEWAY
Creating Opportunities

One-Stop Connection to UMaine Research, Education, and Outreach
“...the most [significant] barrier to successful translational research: the inability to create and sustain dynamic and innovative multidisciplinary research teams.”

WHAT IS TEAM SCIENCE?

A collaborative effort to address a scientific challenge that leverages the strengths and expertise of professionals trained in different fields.

The science points to interventions for:

• Assembling teams
• Collaboration planning
• Providing professional development and education opportunities
• Supporting leadership development opportunities
• Promotion and tenure credit for team-based work
• Study and measurement

## Features of Team Complexity

<table>
<thead>
<tr>
<th>KEY FEATURES</th>
<th>LOW COMPLEXITY</th>
<th>HIGH COMPLEXITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Small (2)</td>
<td>Mega (1000s)</td>
</tr>
<tr>
<td>Task Interdependence</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Boundaries</td>
<td>Stable</td>
<td>Fluid</td>
</tr>
<tr>
<td>Goal Alignment</td>
<td>Aligned</td>
<td>Divergent or Misaligned</td>
</tr>
<tr>
<td>Integration</td>
<td>Unidisciplinary</td>
<td>Transdisciplinary</td>
</tr>
<tr>
<td>Diversity</td>
<td>Homogeneous</td>
<td>Heterogeneous</td>
</tr>
<tr>
<td>Proximity</td>
<td>Co-located</td>
<td>Geographically Distributed</td>
</tr>
</tbody>
</table>

International Network of the Science of Team Science (INSciTS)

INSciTS Special Interest Groups

Which SIG is right for YOU?

https://www.inscits.org/sigs

Team Science Education and Training
Co-Chairs: Wayne McCormack and Liz Ryder
Create, Assess, Share, Disseminate

Team Incubation and Acceleration
Co-Chairs: Ellen Fisher, Hannah Love, Alyssa Stephens
Build, Innovate, Generate, Inspire

Scientometrics and Data Analytics
Co-Chairs: Zaida Chinchilla-Rodriguez, Lin Zhang, and Yi Bu
Analysis, Networks, Data Visualization, Indicators

Fostering Team Science in Academia
Co-Chairs: Steve Crowley and Kathy Halvorsen
Recognize, Reward, Assess, Promote

Intereach
Co-Chairs: Kristine Glauber and Christine Hendren
Professional Development and Developing the Profession
PhD, Interdisciplinary: Team Science Leadership

Management of Large Interdisciplinary Team Science Projects: A Multi-methods Approach to Examining Competencies

Dissertation Defense by Alice (Pips) Veazey

March 10, 2017
1:00 PM

University of Alaska Fairbanks
Fairbanks, Alaska
Sandy Pentland, MIT

Sociometers and team success
Team performance driven by 5 measurable factors:

1. Everyone in the group talks and listens in roughly equal measure, keeping contributions short
2. Members maintain high levels of eye contact, and their conversations and gestures and energetic
3. Members communicate directly with one another, not just with the team leader
4. Members carry on back-channel conversation or side conversations within the team
5. Members periodically break, go exploring outside the team, and bring information back to share with others
1. Project Management
   A. Knowing
   B. Doing

2. Shared Leadership
   A. Organizational Management
   B. Organizational Empowerment

3. Personal Competence
   A. Team Management
   B. Self-management
   C. Self-awareness

4. Social Competence
   A. Relationship Management
   B. Social Awareness

5. Communication
   A. Internal to team
   B. External to team

http://search.proquest.com/openview/4077d8f594272097f4611dfa9dd479b8/1?pq-origsite=gscholar&cbl=18750&diss=y
TEAM LEADERSHIP

Project Management
The application (doing) of knowledge, skills, tools (knowing), and techniques to project activities to meet the project requirements

Communication

*Internal*: communication within the team

*External*: communication between the team and the rest of the world

Sharing information...

Shared Leadership
A leadership style that broadly distributes leadership responsibility and can be formally appointed at the outset...or can emerge over time.

*Organizational management*: organizing, planning, leading and controlling resources

*Organizational empowerment*: empowering employees in an ongoing process of providing the tools, training, resources, encouragement and motivation people need to perform at the optimum level; enabling individuals to adopt new behaviors that further their individual and organizational aspirations

Social Competence
Ability to understand other people’s moods, behaviors and motives in order to respond effectively

*Relationship management*: clear communication and effective handling of conflict; the bonds built with others over time; ability to see the benefit of connecting with many different people, even those who are difficult partners

*Social awareness*: carefully consideration of what people want, and a plan to communicate with them in a way that is intended to meet that need

Personal Competence
Ability to stay aware of your own emotions and manage your behavior and tendencies

*Team management*: ability of an individual (or an organization) to administer and coordinate a group of individuals to perform a task

*Self-awareness*: ability to recognize your own emotions and their effects on yourself and other people

*Self-management*: builds on self-awareness, using self-control to ensure that emotions don't control you regardless of the situation
Research collaboration: some critical elements

• Listening
• Questioning
• Visualizing
• Collaborating
• Suspending belief
• Facilitating and more
FOUR LEVELS of LISTENING & CONVERSING

1. Download
   Listen from HABIT
   POLITENESS

2. Factual
   Listen from OUTSIDE
   DEBATE

3. Empathic
   Listen from WITHIN
   DIALOGUE

4. Generative
   Listen from the FIELD
   COLLECTIVE CREATIVITY
A beautiful question is an ambitious yet actionable question that can begin to shift the way we perceive or think about something – and that might serve to bring about change.
Interdisciplinary Research Teams

Alaska NSF EPSCoR (Established Program to Stimulate Competitive Research) builds Alaska’s scientific capacity by engaging in research and education projects supported by the state of Alaska and the National Science Foundation.

Leadership Competencies

Project managers and leaders from the NSF EPSCoR community participated in a group concept mapping exercise, through which they developed a map of the competencies needed to effectively manage large and complex team science programs. While there is an existing body of knowledge pertaining to the field of "project management" within professional organizations and degree programs, participants found project management skills to be only one of five critical elements of effective team science management. They also identified four other conceptual groupings as important components of a competency framework: shared leadership, personal competence, social competence and communication.

Visualization Space

Built in 2016, Vis Space is an interactive, high-resolution visual environment designed to enable discussions and decision-making by policymakers, researchers, and industry leaders. There is a growing need for such environments stemming from advances in visualization technology; data sets of unprecedented size; an increasing need for team approaches to complex research and policy questions; and a growing acknowledgement of the importance of visual stimuli to fully engage the decision-making capacity of the human brain.

The Alaska Adapting to Changing Environments (ACE) project examines the mechanisms by which communities adapt to environmental and social change. The six-year (2012-18) effort has focused on subsistence users in Northern Alaska, fisheries in Southcentral Alaska, and tourism businesses in Southeast Alaska.

Alaska Fire and Ice (F&I), 2018-23, uses remote sensing, fieldwork, laboratory experiments, and modeling methods to study climate-driven changes to two critical Alaskan systems: wildfire regimes in the Alaskan boreal forest, and the coastal ecosystems of the Gulf of Alaska.

1. **Project Management**
   A. Knowing  B. Doing
2. **Shared Leadership**
   A. Organizational Management  B. Organizational Empowerment
3. **Personal Competence**
   A. Team Management  B. Self-management  C. Self-awareness
4. **Social Competence**
   A. Relationship Management  B. Social Awareness
5. **Communication**
   A. Internal to Team  B. External to Team
COLLABORATION PLAN

Detailed plan that describes multi level ways the group will plan for and support effective collaboration.

Abraham Lincoln

“I don’t like that man very much; I must get to know him better.”
Work today
Vivek Murthy, Surgeon General of the United States

WORK AND THE LONELINESS EPIDEMIC
Reducing isolation at work is good for business.

61% (from 40%) of Americans feel lonely
20% of Americans like their jobs
Overlaps & Distinctions in Practitioner Jobs: Both Helpful in Defining Community Needs

Many overlapping responsibilities
- Job activities and specific, transactional challenges, e.g.
  - Budget duties
  - Meeting design and facilitation

More distinct between job types
- Institutional placement
- Chief stage(s) in the research life cycle
- Success metrics
- Career trajectories
- Funding continuity

Role: I2S
Integration & Implementation Science Specialist
Institutional Placement: Regular Rank Tenure Track Faculty

Role: IES
Interdisciplinary Executive Scientist
Institutional Placement: “Alt” Academia, Research Organization Management

Role: RDP
Research Development Professional
Institutional Placement: Academic Administration/Research Development Support

Role: CEM
Community Engagement Manager
Institutional Placement: Active in many sectors; unless for a large organization, this is often part of a broader role.

Shared Knowledge
Shared Boundary-Spanning Skills
Shared Disposition & Tacit Wisdom

Despite the daunting challenges caused by the pandemic, UMaine set another new record in the past fiscal year by generating $133.6 million in external funding, an all-time record high.
Instructions for living a life:
Pay attention.
Be astonished.
Tell about it.

Mary Oliver
Thank you.