



PERFORMANCE AND PERCEPTION AT A SCIENCE & POLICY BOUNDARY

EVA M. WINGREN

Community of Undergraduate Research Scholars, Barrett Honors College, Arizona State University

Boundary Organizations

In the 20th century, scientific support and technical expertise became more important for making policy decisions that impacted people and the environment. Boundary research originally focused on keeping the realms of science and policy free from each others' influences but recent scholars have encouraged collaboration in a science/policy hybrid space¹. Although federal science agencies support projects that encourage university researchers to focus on useful solutions to topical issues, they also require traditional academic productivity. Recent interdisciplinary research has focused on uncertainty in the decision making process². This study extends previous research that suggested that the credibility, legitimacy, and salience of university research determines its effectiveness in the policy process³.

Research Question:

What tensions does a university boundary organization experience between the aims of their scientific and non-scientific audiences?

Dramaturgical Theory

Dramaturgical theory treats all human interaction as a performance⁴. By identifying audiences, roles, conflicts, and instances of "staging" different events, we gain greater understanding of the ways boundary work is "staged" differently than regular academic work. Theater practitioners have been moving towards more participatory theater as a tool for discussing and ameliorating social tensions, a mode of two-way communication that resembles boundary work ideals.⁵

Case Study: DCDC and Greater Phoenix Water Management

The Decision Center for a Desert City (DCDC) is a boundary organization funded by a Decision Making Under Uncertainty (DMUU) grant from the National Science Foundation (NSF). Their mission is to produce research on climate change, vulnerability, and decision science in collaboration with Greater Phoenix water policy makers. Their flagship project is a computer simulation called WaterSim, presented both online at <http://watersim.asu.edu> and as a facilitated presentation in the Decision Theater, an immersive educational space.

Interviews and Observations

Our research team conducted semi-formal interviews with university researchers affiliated with DCDC and members of the water management community, and other identified boundary players. The study also draws on ethnographic observation of DCDC events, including "water briefings" that are open to the community, informal panel discussions and socializing, facilitated and standardized tours of WaterSim for purposes of studying the decision making process, and annual NSF and executive advisory committee site visit presentations.

Some Organizational Tensions

Performance: WaterSim as Theater

"We use what I call storytelling, create future stories... WaterSim is a very interesting device to convey issues surrounding water and the decisions people make."
– Science participant

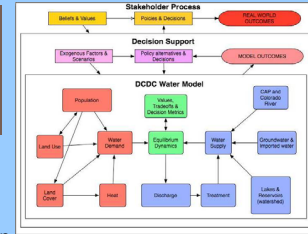
- WaterSim is a boundary object, a tool designed to aid cross-boundary communication and policy making.
- Visually engaging frontstaged interface helps tell the story for non-technical audiences.
- DCDC scientists emphasized the importance of a transparent, politically neutral model
- where none of the workings are hidden backstage, in order to gain trust.
- Policy interviewees thought the model was not at the scale they use to make decisions, and left out considerations such as groundwater and legal constraints.
- Water policy makers feel that they were not consulted in its creation, reducing their trust of its assumptions.



Perception: Organizational Structure and Teamwork Tensions

"The system works for high disciplinary and traditional science. Up there they know when they go to Congress they have to say 'cutting edge, leading America into the future,' really creative stuff." –Science participant

- DCDC has used many models to define their work and the way teams interact
- During two and a half year NSF review, many people adopted this figure out of desire to define their role in the organization for NSF.
- One scientist used a different figure, which NSF interpreted as lack of team integration.



- NSF did not think policy makers were appropriate for role of executive advisory board members. Replaced with scientists.
- Interviews indicate that NSF wants more hard science, but higher NSF officials use boundary work as part of the script to appeal to federal advisors. Points to performance tension within NSF about their changing mission.

Two-Way Communication: Reactions to Water Briefings

"What's important to me about those briefings is sometimes I do stupid things there, but the students in those rooms are our future employees...I like to go in there and tweak their noses sometimes. I think they get [only] one viewpoint from professors." – Policy participant

- Water briefings draw a mixed audience with varied backgrounds in water, so presenters must satisfy basic understanding and more technical questions.
- Water managers saw question and answer period seen as a time to manage audience's perception about politically sensitive issues.
- Social networks reinforced and new ones built between managers and students.
- Water managers find briefings valuable as entertainment and a break from routine.



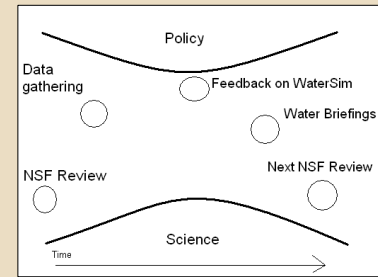
Performance metaphor applies to computer models because they are manipulable representations of reality. Backstage mathematical properties and assumptions make up the "script." Visually engaging user interface creates frontstaged "play" that users see and manipulate.

Water Managers want to be able to see and trust all backstaged information and processes. This would be accomplished by involving them earlier and more often in the production process.

Teams present a unified version of reality. Revealing the secrets of the performance reduces the perception of unity.

DCDC audiences that want the frontstaged story

- NSF
- University
- Media to reach public and political leaders



DCDC performances are pushed around the boundary space by pressures from the scientific and policy spheres

Water briefings are moving towards two-way communication. Of all boundary activities, water briefings seem to be succeeding in bringing people together for communication.

Works Cited

- Miller, Clark. 2001. "Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime." *Science, Technology & Human Values* 26(4): 478-500.
- Guston, David. 2001. "Boundary Organizations in Environmental Policy and Science: An Introduction." *Science Technology and Human Values* 26(4):399.
- Cash, David et al. 2003. "Knowledge Systems for Sustainable Development." *PNAS*. 100(14): 8086-8091.
- Goffman, Erving. *The Presentation of Self in Everyday Life*. Anchor, 1959.
- Boc, Augusto. *Theater of the Oppressed*. Pluto, 2000.

Acknowledgements: Dr. John Parker, Dr. Beatrice Crona, Dr. Peggy Nelson, Scott Ingram, the CCURS seminar participants, and the interview participants for being generous with their time.

This material is based upon work supported by the National Science Foundation under Grant No. SES-0345945 Decision Center for a Desert City (DCDC)



Semi-formal interviews

DCDC

Policy community

Other identified boundary players

Ethnographic observation

Water Briefings

Facilitated tours of WaterSim

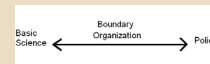
NSF reviews

Informal panels

Socializing

➤ The perception that a team is working cohesively is important to effectively work on the boundary, just as the perception of teamwork is important in pulling off a role. DCDC has changed to a more hierarchical way of portraying their organization that, while more truthful, lacks the visual appeal of interconnected teams.

➤ Teams present a unified version of reality that can override actual social dimensions. Members of the team have the power to give away the secrets of the performance, which may in this case reduced the perception of unity DCDC was attempting to create.



Dramatic Typology for application to organizational tensions

- Audience
- Role
- Team
- Rehearsal
- Entertainment
- Performance
- Storytelling attempting to create a convincing reality
- Backstaged/frontstaged
- One-way communication (traditional performance)
- Two-way communication (audience participatory)

DCDC must create a perception among their various audiences that they are dealing appropriately with research on desert water issues, in order for their boundary work to be successful and draw more participants. Sometimes this involves emphasizing hard science results over social networking gains. Sometimes it means making their research products transparent and widely available. However, frustrations and tensions revealed in the interviews indicate that water managers do not feel their views are being appropriately sought during the events that staged for them, Water Briefings and press of WaterSim. In addition to engaging people both sides of the science and policy bound, DCDC should encourage two-way commur to make their products more useful to polic decisions.

Concluding Thoughts

- Utility of dramaturgy for studying boundary organizations
- Models and dynamics of organizational change allows us to observe management of tensions firsthand
 - Tools to develop more effective performances
 - Evaluate work for purpose of enhancing boundary work effectiveness
- Computer modeling as theater
- Forum for collaborative communication
- Need to balance social betterment and scientific rigor and autonomy