*Reflect on what you have learned so far, what you feel might be most challenging about the class, and what you recommend for structuring the class in a way that will make it most valuable for you.*

*Write a concise reflection statement and post it directly to me (@tyferre) in Slack. Begin by stating whether you feel that you approached, met, or exceeded the following expectations for this week.*

*Engaged with the course topic, beginning to think more critically about risk assessment and decision making. Made an effort to learn any new skills required.*

**Reflection One**

I feel that approached the course expectations for this past week given that I scarcely fiddled with the provided code and am now submitting a late reflection. I suppose I conducted my own risk-benefit assessment of completing a report for the TAAP versus allocating more time towards my enrolled course obligations and made the decision that I would be able to “catch up” to my course expectations after this coming Friday. Perhaps, though, providing a more in-depth self-assessment I would say that I am beginning to think critically about the course foci since I also applied for and was accepted to attend the Southwest Adaptation Forum taking place in Albuquerque in mid-October.

I think the most challenging aspect of the class will be developing a compatible state of unbiased empathy that might best serve stakeholders in emotional, challenging scenarios. It’s hard to make a recommendation for class structure after only the first week of class so instead I’ll make a commitment to provide you with important feedback throughout the course should the occasion arise.

What I can say, though, is that this class has already been an exciting opportunity to further explore many of the concepts that we have discussed in our one-on-one meetings for some time, now. What I appreciate about the course after the first week is the inward analysis of our perceptions of the language surrounding *risk assessment*.What interests me most is the perceptions of risk we all carry as decision-makers and the exploration of how “gut” decisions might overrule careful investigations of risk. I wonder if there might be opportunities for us to explore facilitation skills because I believe the communication of risk is as valuable as conducting the assessment itself!

August 30, 2022

**Reflection Two**

I’m excited to begin working in the Regulators group as part of the overarching group project because I believe it will be the most challenging role. As discussed in my previous reflection, I believe that this assignment will be the most productive effort in order to practice unbiased empathy. How a regulatory stakeholder can deliver *fair* use guidelines will take some unlearning and a lot of listening, I’m sure. In fact, I believe most decisions are made analyzing the issue through a single lens of *economic sense*. However, a concept I’ve been toying around with since ending my time in Madagascar is the idea that we humans make decisions through a three-dimensional lens comprised of economical sense, trust, and respect.

As a volunteer, it was—at first—unusual to sit through hours and hours of meeting for weeks on end as people in my community met and discussed various decisions. After a time, I realized that these processes were working to establish *trust* and *respect* amongst community members. While the financial dimension of a decision was important, its importance was nowhere near the concern of everyone feeling *heard* and *understood*: the speeches often incorporated long periods of expressed gratitude for everyone’s attendance, a recognition of the complexity of the decision, and clear demonstration of the speaker’s stance on the issue at hand.

From my limited experience in understanding how decisions are made in within the United States, I believe that economic value of the decision plays a central—and often the only—role in the process. The ease and scale at which capital can be mobilized in our country in the name of progress and productivity overshadow the necessary steps of establishing, building, and maintaining trust and respect with the community where use-decisions are made. I wonder if our society hinges on the application and integrity of legal systems to amend the gaps in trust and respect that remain after our rushed, one-dimensional decision evaluations.

Could the treatment of groundwater (and most natural resources) as a common-pool resource better inform the role of Regulators, especially during use-decision standoffs? How can common-pool theory be applied to develop unbiased, empathic rulemaking? Surely a side-effect—if not an objective—of applying common-pool theory to regulatory efforts will be to localize rulemaking from the national to the regional scale. I don’t think it’s a bad thing and I wonder if it is a valuable consideration to discuss for the purpose of this project. Could we try to incorporate aspects of trust and respect into our risk assessments and if so, how/when are they incorporated?

**Reflection Three**

I’m really excited to learn how the water-user groups are calculating their utility curves and understand where their values are stored. I’m curious if there are disagreements within the groups about what parameters are most important in calculating these curves since there is no singular “Town,” “Factory,” or “Environment” value framework. Do members of the “Town” group see themselves as apart from the rest of their group (within the frame of this exercise) in terms of their use-priorities? How do perceptions of socio-environmental responsibility differ between the “Factory” members and is profit valued equally among them?

As regulators, our rulemaking will be a compromise of smaller compromises made among separate decision contexts. What is the measure of equity and do breakthrough curves deliver us to our common goal? Can we as a class conduct a survey about the relative importance of each water-user’s value system? It could be an informal, anonymous submission but this could be valuable data as the regulators develop rules and fee structures. I’d like to hold the regulators up to a high standard of delivering “what the people want” but I’d like to see how we can incorporate “majority rule” with “minority rights.” Which water-user will have the lowest priority in the eyes of the public? Can we protect their rights? To what degree? is a question that’s too difficult for me to consider right now.

All the while, I ponder over “Don’t let perfect be the enemy of good.”

September 11, 2022

**Reflection Four**

Admittedly, I am still learning to understand what *uncertainty* is. I’ve since begun reading *Communicating Uncertainty: Media Coverage of New and Controversial Science* to help develop a better grasp of not only how science—and the associated uncertainty—is disseminated to the public (and other scientists), but *why* it is communicated. I’ve come to determine that the “why” of science communication should inform the “how” and circumstances in which it is communicated, but it seems from an informal survey of life experience that people often stop after the decision about “why” they want to share their scientific claims.

This past week has repeatedly surprised me as my team and I have come to understand how *real-world* regulators establish fee structures: it’s disarmingly simple. How have I never learned the way these fees were determined? In spite of the simplification we made to create our town/environment/factory/regulators world, I don’t want to accept that these fee equations should be so narrowly constructed. It feels strange to have subjectively valued the town and environmental utilities and determined protection thresholds at 0.6 and 0.7 respectively. I’d like the opportunity as regulators to communicate with the *community* why we made these choices and discuss our established fee equations and the metrics we track to levy these fines.

To throw some jargon around, I’ve recently learned about precise descriptors that refer to three dimensions of justice that are *hot topics* in climate adaptation conversations: recognitional, distributional, and procedural justice. For the purposes of this class, I think it might be interesting to focus in on recognition and procedure. *Recognitional justice* as it relates to our class project could look at:

* The *relationships* between each team (e.g., do the town and environment collaborate? Do they think collaboration is beneficial? Is the factory ostracized from the community decision-making setting?)
* In what *context* are we constructing utility functions (e.g., do students feel the need to restrict higher utilities to much lower metrics given their external perception of socio-environmental well-being?)
* The degree of *vulnerability* that each stakeholder perceives (e.g., I’m sure the town and factory might have some overlap given some of the people from the town are likely working in the factory. Nevertheless, all living things need safe and clean environments to thrive and so the metrics can’t be too lax)

This attempt to incorporate recognitional justice aligns with an effort to shift from a “thin paradigm of justice that demands only science-based assessment” of risk to something more holistic and reflective of what is possible in the context of our little world (Preston 2019).

*Procedural justice* would likely be an elaboration of the “decision rodeo” that I understand would provide different stakeholders an opportunity to exercise their political power to shape adaptation strategies (Holland 2017). I wonder what the rodeo will be like. I wonder if we could even identify related inequities that could hypothetically arise depending on what occurs during this exercise. Perhaps I’m trailing off but I just find these elements of *justice* so aspirational and simultaneously lofty. As I reflect on how a critical analysis of this course exercise could illuminate the obstacles and opportunities that exist in *real-world* climate adaptation decisions, I consider the role of communicating, managing, and leveraging uncertainty in achieving the aspirational justice we hear about all of the time. What kind of poking and criticism could build a finer intuition that allows us to apply what we learn here to our future pursuits?

September 22, 2022

**Reflection Five**

This week I continued to explore a deeper understanding of uncertainty and the role it plays in our course project—particularly as regulators. Last week I considered the *how* and *why* of science communications; this reflection explores a little bit of both.

Decisions can be assigned to one of three broad categories: decisions about action thresholds (Is it time to act?); decisions with fixed options (Which provides the best outcome?); and decisions about potential options (What approaches might be available given certain conditions?). In the role of regulators, I believe each decision context pertains to different aspects of our duty to set fee structures. For example, the *action threshold* context applies to establishing acceptable limits of metrics we would monitor in order to determine if fees must be levied against the factory. These metrics would be selected through a *fixed decision* context of what metrics we have the capability to monitor (through breakthrough curves). Ultimately, the types of fees and other, potential responses (e.g., factory shutdown) are determined in a *potential decision* context that requires us regulators to evaluate what is possible in order to achieve the best possible outcome for all stakeholders.

In their paper, “Communicating scientific uncertainty,” Fischhoff and Davis (2014) describe a method of effective science communication by characterizing, assessing, and conveying uncertainty relevant to each decision context. Specifically, the authors suggest that communicators 1) characterize uncertainty by “identifying the issues most relevant to the choice,” 2) summarizing the relevant information in a useful format, and 3) tailoring messages that provide decision-makers with detail suitable to the choices they need to make.

An important detail in the article is the discussion of the scientists’ ability to “discriminate among states of the world” and the decision rules that represent “tradeoffs made among possible outcomes.” This is where I feel we have the opportunity to engage in a rich discussion during the decision rodeo whereby us regulators have to opportunity to eliminate some uncertainty about our values by “communicating explicit decision rules” and leaving the other teams with just the uncertainty about the model’s ability to characterize the real world. I hope that you will be able to guide the classroom in building stronger intuition about uncertainty as it pertains to this model as we approach the decision rodeo and beyond.

For my future reference, I’m going to include this block quote from the conclusion of the cited paper (Fischhoff & Davis, 2014).

For scientists, uncertainty obscures theoretical questions. For people who rely on science, uncertainty obscures choices. Those awaiting a signal for action need to know whether the evidence is certain enough to pass the threshold defined by their decision rule. Those choosing among fixed options need to know how far to trust predictions of valued outcomes. Those creating options need to know how well the processes shaping their outcomes are understood.

Book: Thinking Fast and Slow

**Citations**

Fischhoff, B., & Davis, A. L. (2014). Communicating scientific uncertainty. *Proceedings of the National Academy of Sciences*, *111*(supplement\_4), 13664-13671.

September 25, 2022