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Encouraging Innovation

Thoughts from Ted Ames, Prize Winner

by Linda Silka

Competitions and prizes are being increasingly turned to as tools for stimulating innovation. Maine is fortunate to be home to Ted Ames, winner of a MacArthur “genius grant.” Ames continues to be a major force for finding innovative solutions to problems in Maine’s marine fisheries. In this interview with Linda Silka, he shares his thoughts and reflections not only on the impacts on innovation and of receiving this recognition, but also his understanding of the kinds of opportunities Maine needs to create for future generations if innovation is going to flourish.

A key question throughout this issue of *Maine Policy Review* is how to strengthen innovation. The search for ways to enhance innovation has taken on new urgency in the face of problems that seem intractable. Various strategies have been touted as ways to increase innovation: new forms of training, strengthened educational programs, improved mentoring, and the development of prize competitions aimed at increasing innovation. The Nobel Prize is perhaps the most familiar such international award, but it is by no means the only one that highlights and promotes innovation and creativity. The Institute of Physics Prize for Innovation is now awarded annually, and a new prize for mathematics innovation has just been announced with significant dollars awarded to winners. Among the range of innovation awards, the MacArthur Fellows Program, colloquially known as the MacArthur “genius grant,” typically generates the most buzz. Annual announcements of the awards are eagerly awaited and garner much press coverage for the recipients. Who better to give us insight into the impact of such prizes than someone who has won the genius grant and has had a few years to reflect on the impacts.

We are fortunate in Maine to have our own MacArthur Fellow—Ted Ames—who won the award in 2005 for his innovative work on ocean fisheries. Ted has been a lifelong advocate for marine fisheries and has called for using our best problem solving to save these endangered resources before they are beyond hope. I had the opportunity to interview Ted in late 2013 about his thoughts on innovation in general and his views on

whether prizes are an effective strategy. We covered many topics, including whether prizes are an effective way to make people more creative and whether they have positive effects in other ways. If so, how might we encourage and magnify these effects? More broadly, this interview explores Ted’s views on Maine’s historic fishing economy and strategies for tapping the innovative talents of the state’s citizens to halt the decline of the Gulf of Maine fisheries.

Ted has had a lifetime of immersion in fishing issues. He has been a groundfisherman and a lobsterman. As a young person (at 21 and after three years in the Navy), he moved to Missouri and began studying electronics engineering. After moving back to Maine and starting to fish again, Ted attended the University of Maine to study biochemistry. He taught at the high school level for many years and continued to fish. This diversity of experiences has figured in Ted’s insights and recommendations for how we keep from undermining natural innovation skills. He suggests that we need to provide opportunities for young people to explore different realms at an early age so they avoid getting stuck in a single point of view.

TED’S FOCAL ISSUES

Ted has long been concerned with the depletion of the fisheries. His work has focused on questions such as, How can we better understand what devastated the Maine fisheries? How can we get different

parties with conflicting understandings of the situation involved in the requisite discussions? How can data contribute to the discussion and understanding? And how can we move beyond merely understanding the problem to arrive at solutions so that future generations will not face a world without this valuable resource?

PERILS OF INNOVATION

Ted comes from a fishing family and grew up on Vinalhaven, an island in Maine's Penobscot Bay. His father's fishing career included fishing off the coast of Newfoundland, where he began to see large trawlers from Europe trolling the rich cod fishery along Newfoundland's coast. Ted remembers his dad's reminiscing about earlier times when there were schools of fish in the Newfoundland waters that extended well beyond what the eye could see. The prolific schools of fish sometimes extended for 10 to 15 miles. The Newfoundland economy was built around this seemingly inexhaustible fishery. Yet, innovative new factory ships were so efficient they effectively wiped out large segments of Newfoundland's fish populations. Innovations are not inevitably good.

As Ted observes, the efficiency of new fishing technology—the so-called factory ship—has become so advanced that they can devastate fishing grounds. And what happened in Newfoundland has now happened throughout the Gulf of Maine. What was once one of the most productive fishing grounds in the world has become the site of dramatic declines in ground fish populations.

But Ted notes it is not just the loss of fish stocks that should be of concern. Focusing on just the loss of fish misses crucial parts of the story for we have not begun to figure out all the unintended consequences beyond the impacts on the fishing stocks. Self-contained factory ships include processing innovations that allow for onboard cleaning, storing, and freezing of the fish. So as the factory ships decimated fishing grounds, they also disrupted the ecology of the local fishing communities. In the past, local fishing villages and the fishing fleets were deeply interconnected. The boats came ashore with fish that would be processed in the local communities. Eastport, Maine, for example, once housed nine sardine factories for processing the fish landed by local fishing fleets. Now there are no sardine processing plants left in the entire state. Past fishing practices produced what economists call multiplier effects. Jobs were generated that depended on a strong

local fishing economy when the boats came ashore—people purchased fishing equipment, sought repairs, restocked supplies, purchased housing, ate in restaurants, frequented local bars, and so on. Factory ships have little need to come to shore, which leads to diminished coastal communities.

From Ted's purview, innovation and advances are far from unalloyed goods. Any attempt to address such a complex situation needs to consider an array of impacts in holistic fashion. The capacity to focus attention on a more whole-ecosystem approach, according to Ted, is the sort of thing that innovation prizes can encourage, producing perspectives likely to be overlooked in the pursuit of short-term economic incentives.

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INNOVATION IS NEEDED TO ENSURE KEY DIMENSIONS ARE NOT MISSED

In making this point, Ted notes that there are many ways that we miss dimensions that may be key to solving our problems. We need to pay attention to the ecosystem, carefully observing the interconnectedness of its elements, and we need to consider multiplier effects. In addition, Ted points to the great importance of attending to scale. This problem of scale is, according to him, at the heart of many mismatches of problems and proposed solutions. What does he mean? He points out that because management was evaluating fish only at very large scales and found a slight reduction in total numbers of fish, they were unable to detect the disappearance of small populations. Fishermen, operating at the same scale as the fish, could see that stocks in an area were becoming overfished and could respond rapidly. Had management been aware of declining population components, they could have responded appropriately.

Through Ted's years of fishing and discussing challenges with other fishermen he has seen the extent of scale mismatch. Everyone—fishermen, managers, policymakers, and coastal community leaders—has a vested

interest in maintaining healthy fisheries. When fishermen go out to their familiar and habitual fishing grounds, they may discover that fish are disappearing, or alternatively, that the fishing remains productive. The policymakers, in their focus on maintaining fisheries, aim to develop policies that will further the goal of maintaining healthy fisheries, but they take as their purview large parts of the Gulf of Maine. The scale of the policymakers' focus differs from the scale of the fishermen's, but does the scale match the behavior of the fish? Does it match the behavior of the fishermen? As Ted notes, schools of fish are not like fields of wheat in Kansas: fish move around. The scale different people focus on as they try to understand the problem or develop a solution may or may not work. So how do we think about this? How do we pay attention to these scale questions and build appropriate management plans? Ted has been urging discussions of these points for years.

So, what does this have to do with prizes? According to Ted, one of the things that happened upon his being named a MacArthur Fellow is that people began listening to what he had been saying about scale. The award gave him what he refers to as a bully pulpit, and people began to listen to his message about the complexities of scale in policy decisions. Much of Ted's work implicitly involves issues of scale: How do we create policies that are appropriate to the scale of the relevant phenomena? What innovations in thinking will be helpful here?

EDUCATION AND INNOVATION

What Kind of Education Should We Offer to Encourage Innovation?

Ted has been using his prize to remind people that it is not just prizes that are important: Education is important. Ted acknowledges that science education is important. Young Mainers need to learn science, technology, engineering, and math in the classroom, but we fail if we think that subject matter alone is important. A part of education should be helping our youth to learn to take risks, as risk taking is part of what leads to innovation. For innovation to occur, it is important to look at current problems, analyze accepted solutions, and then think in alternative ways. Students need to have experiences that will help with this, in part by grappling with varied scenarios that demand reflective consideration. They need to train not for what exists now but for what might exist in the future, which as Ted points out is hard but important. We look around

and see that many jobs have disappeared; it will take innovation to bring these jobs back or to create alternative jobs. We need to encourage innovators.

What Kinds of Experiences Should People Have?

According to Ted, hands-on science experience is important. Even at an early age, he was an experimenter. As a child, he had a flock of pigeons, which he studied closely, keeping detailed records and making changes based on what the records helped him to see. This was just one of many experiences that taught him about the importance of science and systematic approaches to the study of the natural world that enable patterns to emerge and changes to be seen. His focus on record keeping showed him the great value of records for moving beyond the immediate. Ted posits that we not only need to keep our own records, but we need to look for past records and study and learn from them. As a consequence, Ted has gone back to look at the often neglected historical records on the fisheries that various people—fishermen, naturalists and the like—have kept over the years. He believes that it is important to ask what we can learn about the fisheries from past records kept by people in different roles, at different locations, and from different times. What can we learn about fluctuations of the fisheries over time and place? What will we miss if we fail to consider the historical records? Ultimately, we need to ensure that systematic habits of inquiry are encouraged. From his childhood, Ted's habits of natural curiosity were rewarded. Children have such habits, and it is important to avoid suppressing them. Specifically, we need to encourage these habits so that they link science with innovation.

Teachers Make a Difference

Ted speaks of professors who made a difference when he was in college by encouraging him to think outside the box with regard to science. He notes that this did not happen only in the courses that one might expect. He was much affected by the creative approaches of his history and chemistry professors whose penetrating questions challenged and reshaped his understanding. Through their teaching strategies, they exposed him to the subtlety of ideas and to ways of approaching a problem without viewing current knowledge as static or final. The teachers presented enough information that students developed a depth of understanding of a problem, but the ideas were presented in such a way that students were encouraged to critique the accepted view

and bring multiple perspectives to bear on solving the problem. Ted came away from these experiences understanding that as teachers and as learners we need to become immersed in the current understanding yet not be closed to seeing beyond that understanding. Otherwise we miss opportunities for innovation, or we innovate in ways that don't fit the context. If training is to lead to innovation, it has to expose people to unexpected ideas, analogies, and perspectives, and do so in ways that are both different and yet not too different. The big questions are, How do we achieve this balance between innovation and tradition? and How we can best nurture it throughout the educational process?

ULTIMATELY WHAT DO PRIZES ACHIEVE?

Ted argues that if the MacArthur award was intended to change his work, it did not have that effect. If he had been younger when he received the award, Ted says, it might have led to changes. But that does not mean the award was unimportant. Before the award he was not reaching a broad audience with his message about the dangers to the fisheries and the steps that need to be taken. His points were not having the intended impact. The MacArthur award enabled him to reach more people and have them treat his message with greater gravity.

The interview with Ted Ames raises a final, overarching question about prizes: What, in effect, is the underlying “theory of action” for why we expected prizes to increase innovation? The assumption could be that the visibility of awards for innovation will bring more problem solvers into the fold and increase efforts aimed at innovation. Or perhaps, it is believed that the prizes help new people moving into a field to see what is valued and to seek new ways to approach problems. Or the assumption may be that the awards rapidly increase the dissemination and implementation of innovative ideas, or that awards, once given, will free winners to be more innovative. Perhaps prizes function in all of these ways; Ted would certainly agree with that statement. Careful reflection on these functions might help us to highlight the innovative practices of the awardees. It might also point to educational practices that are likely to have the biggest payoff in increasing innovation. Prizes are likely to remain an important tool in the innovation toolkit, but how they achieve their impact and should be used remain open questions. 🐟



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Ted Ames is a founding board member of Penobscot East Resource Center. He fished commercially for 28 years and was vice-chair of Maine Department of Marine Resources Hatchery Technology Committee, executive director of the Maine Gillnetters Association, and director of Alden-Ames Lab. He has authored several peer-reviewed articles on historical fisheries ecology, fishermen's ecological knowledge, and related subjects. Ames was named as a MacArthur Fellow in 2005.