South Sound Science Symposium Closing Address
By Joseph K. Gaydos
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Good afternoon. As many of you know, I quite enjoy showing vacation pictures during my presentations. And today, because I know a lot of you probably will want to leave early to beat the traffic, and because I really liked the way Dave Nysewander put his acknowledgements at the beginning of his presentation, I moved my vacation pictures from the end of my talk to the beginning. I also did this because I think it might help me make an important point about place-based science and conservation.

So, let's forget about the traffic that awaits us when we leave this afternoon and let me transport you to another estuary. Let me take you from the Bay of Honduras in Guatemala up the Rio Dulce and further up one of its tributaries, the Rio Tatin. This is a place where manatees graze on sea grasses, and spider monkeys browse the tree tops next to toucans, parrots and other tropical birds. It's a place where instead of bikes, school kids take dug-out canoes to school. Am I giving you the picture this is a long way from Puget Sound?

It was here, while on vacation with my girls (let me point out that my two girls are the ones on the outside here if you've never met my kids) that we visited a small development project and school collectively owned by over 120 Kekchi Indian villages. And wouldn't you know it the day we were there they were having a workshop on global climate change. Now when I saw that it told me two things. First that the Kekchi people preferred Al Gore's PowerPoint to Michael Crichton's book. And second, it reminded me that just as David Dicks mentioned this morning that all politics are local, science and conservation also are local and place-based. And I don't think you could pick a more global concern than global climate change, but these people are concerned with how climate change will impact them locally.

And just today we are using science to help us understand the South Puget Sound Ecosystem, these people were using the science of climate change to help them understand what they can expect in their system: change will influence what the Kekchi bring up in their cast nets, the materials they use to thatch their houses and the diseases their children will face.

There are three tenants to place-based conservation: to know, to connect, and to protect. And just like the Kekchi, we need to know our ecosystem to be able to connect to it and protect it. Science and traditional ecological knowledge are the foundation for us knowing South Puget Sound. What we know about the South Sound system will dictate how we treat it and how it supports our lives.

I don't have to tell you that South Sound is just a little blip on the map of the entire Puget Sound Georgia Basin. I don't even think you can see the booming metropolis of Shelton on this map. And there's a reason why the Partnership has divided the Sound into action areas. It is because each of these areas, like South Sound, has unique ecological characterizations and unique ecological threats. So, while South Sound is just one of the seven action areas in Puget Sound and while Puget Sound is just half of the Salish Sea, we spent the entire day today talking about 750 km of shoreline that we call the South Sound.

We started off with a look at the region's geology. And any good geologist worth their rocks will tell you that geology begets biology. Skip Albertson pointed out that South Sound is quite unique in its physical setting. Reasons for this include the shallow entrance sill just south of the Tacoma narrows and the diversity of small stream systems feeding into South Sound. Interestingly, this sill decreases the flushing in south sound, and increases the flushing time. This very simple unique feature highlights the need to treat areas of Puget Sound differently.

The complex geomorphology, circulation, and water stratification of South Sound also create sensitive areas showing us that we really can't even treat South Sound as a whole but need to understand its parts. One example of this is that flushing times can vary from 8 days to 56 days, depending on the location, wind and other influences. So thanks to our basic understanding of the system's physical components we are able to identify sensitive areas that are prone to low dissolved oxygen and high bacteria levels.

Mindy Robert's discussion of the complexity of understanding low dissolved oxygen exemplified why we need science and models to understand the system and how that understanding can help us mitigate or better manage the area.

Tom Mumford told us that 35-40% of the shoreline has been modified, which is likely impacting important ecological function of feeder bluffs, pocket estuaries and riparian vegetation. Thanks to the work that's been done, we are able to identify changes like these or changes that have occurred in the South Sound kelp assemblages, but we are still unable to say what that means ecologically.

On top of physical conditions and nearshore changes that that predispose areas of South Sound to biological stresses or serve as biological stressors, we heard several talks on how toxic contaminants are introduced to South Sound. While air to marine water deposition is probably a key pathway for PBDEs, Runoff from land likely delivers the largest share of loadings for most contaminants of concern in South Sound including metals and organic compounds including light PAHs.

And we know, what happens on land directly influences what happens in the marine system. Danielle Spirandelli pointed out that sometimes how we think about the problems is important. We're just reaching the point where people are realizing we're an integral part of the ecosystem And while we're still learning, understanding how landscape patterns interact with ecosystem functions is really what's going to allow decision makers, planners, and scientists craft better management policies and strategies to support ecological and human wellbeing in the Puget Sound.

Even though Scott Redman pointed out that contaminant sources vary depending on the toxin and that currently 17.5% of the land mass is urbanized, Nat Scholtz showed us that ongoing development of watersheds throughout Puget Sound is increasing the loading of pesticides, petroleum hydrocarbons, heavy metals, and other potentially toxic chemicals to rivers, estuaries, and the nearshore marine environment via runoff. And while we know that these toxic chemicals in stormwater can adversely impact the health of fish, we still don't understand the fine details that will allow us to mitigate this problem. Managing stormwater to ensure the long-term resiliency of aquatic systems will be a major challenge in the years to come.

And finally we heard about a stressor that many people don't even think about so I'd like to thank Paul Hershberger for bringing up disease; the ugly stepchild of stressors. Fifty years ago we didn't think fish, wildlife and invertebrates got diseases. I mean, hey, they're healthy right, eating all natural food, getting lots of exercise. Now we know that disease can structure ecosystems and the role of disease in ecosystems is as complex as the role of predation. And unfortunately, we know very little about the role of disease in shaping the South Sound Ecosystem.

So how are all these stressors playing out in the system? What impact are they having on the biota? Aimee Christy discussed seasonal phytoplankton trends and really did a nice job of pointing out our limited understanding of plankton, especially for species that are not important as potential human or wildlife health threats. These guys are our primary and secondary producers, yet we know so little.

Duane Fagergren pointed out the South Sound's important role as a forage fish incubator and touched on the issue that with the exception of herring, we really don't have the ability to measure the biomass of most all of our forage fish species like surf smelt and sand lance. So while we can say that there is an apparent recent increase in anchovies in South Sound, we really can't quantify what that means for other important forage fish species. I mean, if we're relying on Duane Fagergren to estimate anchovy populations on the back of a bar napkin, that tells you we need help getting the information we need.

Dave Nysewander pointed out that marine bird populations in South Sound can be divided into 2 groups: breeding and wintering bird populations. While some populations are stable, others like these surf and white-winged scoters are in decline. While all of the risk factors for bird species in decline have not been worked out, it appears that marine bird declines over the last 30 years seem most significant among the species that spend late summer through late spring in western Washington.

While we heard that 5 species of pinnipeds occur in Southern Puget Sound, harbor seals have told us a lot about contaminants in the system. We've seen PCB and pesticide levels decrease as new emerging contaminants increase. And seal work has shown us that while PCB levels are higher in South Sound, they tend to decrease as you go north, whereas dioxin and furan levels increase the farther north you go into the Strait of Georgia. And in a time when all of us probably suffer a bit from ecological burn-out, we did hear good news that that some marine mammal populations like harbor seals and harbor porpoise have or are coming back.

We also had two very nice case presentations today that exemplified how we can use science to answer questions. Scott Steltzner showed us that a trophic shift has occurred in the marine waters negatively impacting Coho survival. He also showed us that how modeling can help us evaluate the degree of restoration that will be needed to restore this species. These type of data are going to be very important as we move forward with our action agenda to restore Puget Sound. The Partnership will be asking the Science Panel about the degree of certainty we have from our restoration efforts.

Jeff Fisher's presentation showed us how science works. Science does not ask do we want to have geoduck aquaculture in the intertidal area – that is a policy question. What we can do with science is ask what are the impacts of intertidal geoduck farming on species diversity or how does the turbidity associated with substrate liquefaction impact the health of fish in the region.

So, David Dicks talked about needing a baseline. Well I challenge that we know a lot about the physical and biological aspects of South Sound and should use this as our baseline. We should consider ourselves way better off than many coastal areas under pressure around the world where people have little to know scientific understanding of the system and even less trend data for species. You know a few years ago the SeaDoc Society was asked to come down to Baja and help evaluate the potential impacts of coastal development on the marine ecosystem from Tijuana to San Quentin. We got there and asked them okay – what do you know about the system. They had so little current data and trends information we told them basically there was no way to estimate impact without knowing what there was to be impacted.

But we can't become complacent with what we know because today, like at any science symposium, we've heard a lot about what we still have yet to learn. And let me tell you there's no better way to piss off a policy person or a politician than to tell them we need to study something more. But I'll say it, while we know a lot we still have a lot more to learn. And that doesn't mean we can't begin to take action, but taking action to improve the situation shouldn't overshadow our need to continue learning. This is going to have to be a flag that the Science Panel will need to keep waiving in front of the Partnership; if we move forward with actions and don't continue to monitor and better understand the system, we're doomed to failure.

At the beginning of this talk I gave you the three basic tenants of place-based conservation: to know, to connect, and to protect. You can't have protection without connection and people won't be able to

connect without knowing. That's what science does, it helps us to know so people can connect and protect. Everybody wants to do the right thing, but without good information and an understanding of what is going on, we don't know what the right thing is!

I recently read a book by the economist Jeffry Sachs entitled The End of Poverty. It his book Sachs points out that people are always saying that we've spent a lot of money trying to rid Sub Saharan Africa of abject poverty, but have little to show for the millions of dollars we've spent. What Sachs is able to show from an economic perspective, is that compared to other things we spend money on we've really spent very little money on ending poverty and that's why we have so little to show. You get what you pay for. I firmly believe that if we were spending more money on monitoring and understanding Puget Sound, we would know a lot more than we do now. Money drives science folks, just like it drives everything else in our capitalistic world.

Well let's think about what we do spend a lot of money on. I'm not even going to comment on the war and our trillion dollar deficit; let's think about how much money is spent every year trying to learn how people think? Companies all over the globe want to know how we think so they can sell us things we probably don't need. And look at the consequences; we know their products!

I've said this before and I'll say it again, in my dream for South Sound and for the whole Salish Sea ecosystem I envision the day when all of us, not the just the scientists and marine biologists, recognize and know our marine resources. I envision a day when we know these resources better than we now know our corporate logos, when we watch those resources more attentively than we now watch the weather, and when we monitor those resources better than we now monitor the NASDAC or Dow Jones Industrial average.

Because when we know and monitor our marine ecosystem like this, saving South Sound and all of Puget Sound will come to us as naturally as if our lives and our livelihoods depend on it, because they do!

Thank you.

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