



2005 PUGET SOUND GEORGIA BASIN

RESEARCH CONFERENCE

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Keynote Address by Joseph K. Gaydos March 29, 2005

How many of you are from out of town? Raise your hands. Wow, that's the most movement I've seen all morning. Welcome to Seattle. Have you ever noticed in these marketing shots, like this one of Seattle or this one of Vancouver... That they always like to show the water? Now, I'm not a marketing expert, but I think they show the water because water inspires us. Water, mountains, wildlife, wild places, these things inspire us. They are what draw people to this area and keep us here. As Brad pointed out, over the next 20 years, these things are expected to draw another 1 to 2 million people into the Salish Sea region. These people are coming here for an unparalleled quality of life that is inextricably linked to our amazing geography and the natural resources it supports.

These people are going to be moving to the Great Pacific Northwest, not the Chesapeake Bay. You know, as a kid I spent about 7 years of my life on the Chesapeake Bay. If you've never been there, the bay is generally a nice warm muddy brown color. In school, the teachers used to tell us that once upon a time, that water ran clear, just like the Puget Sound. I never saw it. A few years back there was a former Maryland state senator Bernie Fowler. Bernie used to be a crabber and fisherman in the bay before his political career. After retiring from the Senate, he noticed, hey, when I was a kid we used to be able to wade in to our chest and still see our feet. Now Bernie is no scientist, but he's invented a little monitoring program where the on the second Sunday in June he wades out as far as he can until he can no longer see his white sneakers through the water. He then measures the water line on his overalls. This is the Bernie Fowler sneaker index. And you know what, those 2 million people moving to the Puget Sound Georgia Basin don't want to participate in the Bernie Fowler sneaker index.

The people moving here want to see clear water and know that when their little daughters take their clothes off and go for a swim, they can see through that water and that water is clean and safe to swim in. Now they don't want to know about it when she's 16 and on her first camping trip with her boyfriend, but that's a different story. Those 2 million people are going to want outstanding outdoor recreational opportunities; places where they can go for renewal, beautiful scenic vistas, and wild experiences.

And those people moving here, they're going to want to have close up encounters with wildlife; animals like river otters that we often consider nuisance species. Isn't it funny that how we always want things we don't have, but often when we do have them, even things that other people want, we take them for granted? Do you know that river otters were extirpated in 11 states and reduced to remnant populations in 9 other states? And right now, 17 of those 19 states as well as the Province of Alberta are spending millions of dollars to re-introduce river otters and restore decimated populations. We complain about the smell and mess when they leave their scat on our dock lines.

Now I have to be honest and say that probably not many of the 2 million people moving here are coming for the SCUBA diving, but I have met 2 people who have moved to British Columbia because of the abundant recreational SCUBA diving opportunities. They're fanatics, but the reality is, this region has the world's greatest coldwater SCUBA diving. This is a sustainable economic resource I still think we have not completely tapped and developed. And even for those people who move here and never dive, they will enjoy knowing that they live on the shores of such a resource that draws people to the region.

And you know, most of those 2 million people who are moving here are going to want to catch a fish, or have their kids catch a fish, or at least catch some crabs. And you know as these resources become limited, our high quality of life will be eroded. As resources become scarce, resource competition develops. Resource allocation is not an issue when there is plenty, but as it becomes scarce, that's what leads to conflict: conflict like the historical salmon wars between Washington and British Columbia, conflict like water rights, conflict like road rage. And if you don't think we're already experiencing resource-limited conflict, I invite you to attend the May 14th special hearing for the Washington's Fish and Wildlife Commission. This special meeting is being held to allow private citizens to voice their concerns about allocation of Dungeness crab between the Tribes, State Commercial Fisherman, and the recreational harvest.

And you know that of the 2 million people that are moving here, most will drive cars, and want a place to live. And the resources we are already finding scarce, will become even more so.

Two years ago over 800 people including many of you that are in this room, met in Vancouver for the 2003 Georgia Basin /Puget Sound research conference. Held in Canada and drawing nearly equal participation from both sides of the boarder, the 2003 conference represented the beginning of this conference's role in supporting transboundary efforts to better understand and restore our shared Basin. And if you haven't noticed, when that conference is held in Canada it's the Georgia Basin / Puget Sound research conference, when its in Seattle it's the Puget Sound Georgia Basin research conference.

And as that last conference closed, Eric Karlsen and bunch of other people reviewed some of the highlights of the event. Over and over, talks, posters, keynote addresses and break-out sessions recognized that:

- our region's future depends on recovering declining populations of fish and wildlife
- mitigating threats and stressors to resources was critical
- and we needed to work better to manage natural resources for long-term sustainability

While we were already working in this direction, our ability to mitigate threats and stressors needs to increase to outpace the ever-increasing human pressures on our natural resources. Talk after talk reiterated that wildlife populations in the region are screaming for help. In light of numerous species declines discussed, it was recognized that basic science on the natural history of many species was needed to enhance conservation or recovery efforts. Despite intensive efforts to recover declining species, for many we still do not know where they go in the winter, at what age or size they first spawn, and other critical basin life history questions. And, although single species management is the standard, we need to begin to work toward developing an ecosystem approach. And as you'll hear this week, we're still not there. Why we're learning more about many species, there's still a lot more to learn and we are very far from being able to manage our resources at the ecosystem level.

Global climate change occupied several sessions at this conference two years ago. We learned that in 15 to 20 years, temperatures in the region are expected to increase 1 to 2.5° Celsius. This is expected to reduce annual snow pack by 70%. We also can expect increasing extremes. We also learned about the need to reduce emissions and plan for the impacts of decreasing snow packs. Just recently, Seattle Public Utilities recently sponsored research in the University of Washington's Department of Civil Engineering to assess the potential impacts of climate change on SPU's water supply. Meetings in the region have examined impacts of climate change on salmon and other resources and Newspapers have been highlighting multi-tiered impacts of climate change. And hybrid gas / electric cars are becoming more available. For those of you that don't actively monitor the hybrid – mega SUV wars, you'll be happy to know that Northwest Environment Watch reported that in July 2004, Washington State was winning the battle between fuel-efficient, less polluting hybrid vehicles and mega SUV vehicles. Score, registered Hummers, 1,100, Hybrids, 6,200.

At the last conference we learned that by the year 2015, the pollution from increases in diesel marine vessels alone, will off set all of the gains made by improving on current automobile technology and that new technologies are needed to reduce diesel engine pollution. Since that conference, bio diesel has become a viable option for owners of private diesel automobiles and boats in many regions and the Washington State Ferries is investigating the economics of switching to this domestically produced fuel source. Bio diesel reduces pollution emissions from diesel engines up to 90%, is cleaner burning, and helps reduce super tanker transport and other expensive and unsustainable practices in the region.

Also since the last PSGB research conference – The Pew Ocean's Commission and US Commission on Ocean Policy, both released their findings. And both of these commissions reiterated what was discussed at the 2003 Georgia Basin / Puget Sound Research Conference –

- Our oceans were in crisis
- We need to do what it takes to ensure a healthy and productive marine ecosystem
- And we need to invest more in science and turn that data into useful information!

At a recent meeting of the California Ocean Protection Council, Leon Panetta, said, "Once in a while we get a nexus of an issue, interest, money and leadership to deal with a major issue- this

is one of those times.” And I hope that if this becomes known as the decade of the Ocean, the Puget Sound Georgia Basin will be seen as a leader in that movement.

The 2001 Stockholm Convention proposed to eliminate the top 12 persistent organic pollutants around the world. Although banned in our Basin, at the 2003 GB/PS meeting we learned that because they are still be used in other countries in Asia, many of these chemicals still rain down on us through transatmospheric transport. Since that meeting, the Stockholm Convention entered into force on May 17, 2004 after ratification by 50 states. It is a monumental step in the right direction.

So ow DID Science become a key player in finding solutions for the problems facing our region? This man was born in Pisa, Tuscany in 1564. His parents called him son, but we know him as Galileo Galilei. Riding on the backs of new found information that bucked current Catholic doctrine, Galileo helped usher in what we now call the scientific revolution of 17th Century. He’s well known for his development of the telescope. But what he really did was teach us that observation and reasoning would tell us about *how* things work on an everyday basis; and that any human could learn these things if he or she worked hard enough. A total heretic, this thinking didn’t win him any awards during his Catholic school science fair, but he did set the stage for Renee Descartes and the political revolution of the 1800’s.

And following Galileo, came other great minds. This man, Anton van Leeuwenhoek, created of the first microscope. He actually created about 500 microscopes, which were really magnifying glasses that were later developed into compound microscopes by a man named Hook, but even with his early prototype, Leeuwenhoek discovered bacteria, sperm cells, blood cells, and numerous other things we accept as common knowledge today.

And so, from its start, science has grown into a well accepted tool and means for better understanding and managing our world, including the Puget Sound Georgia Basin ecosystem. And while we’re on Joe’s study of biographical sketches, let me tell you about a small girl that was born in a rural town in Pennsylvania. Now I guess that all children are born small, but my point is that even when this girl was small, her parents and people around her recognized her keen observation skills and ability to reason. She was an marine biologist at heart, but I believe she became better known for her book examining our inappropriate use of pesticides, *Silent Spring*. But for all the things she’s done, I love Rachael Carson’s quote, "The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction." You see, it is science that gives us that information that inspires us to know and love the world around us.

Recent work by Thomas Ebert and John Southen studying enhanced radiocarbon in the marine environment has shown us that red urchins can live to be well over 100 years old in our marine waters. Now you might love the way urchin taste when prepares for sushi, but to know such facts like how long a red urchin can live is what inspires us to ensure that they survive for generations to come.

And I believe that science will show us that while we are surrounded with an ocean of inspiring facts from this Basin, that we still don’t know but a fraction of the amazing things out

there and each time we teeter on losing a resource, we also stand to lose countless books of inspiring information. A case in point. A 4 meter seal can yield almost 325 liters of fine oil. Because of this, commercial exploitation in the late 1800's reduced these seals that once bred from northern Baja to San Francisco, to a herd of 100 animals. Fortunately, the population has rebounded and science has shown us that, while its an obligatory air breather, the northern elephant seal can dive to almost a mile deep, and while at sea, probably spends more time under water than above water. And good science that showed us that annually, these animals make a full double 6,000 mile round-trip migration from San Miguel Island to the eastern Aleutian Islands and back. And to think a century ago we were 100 animals away from ever learning any of that about such an amazing creature.

Can science recover the Puget Sound Georgia Basin and its fish and wildlife? In 1967, the bald eagle was listed as endangered under the Endangered Species Preservation Act and later the federal Endangered Species Act. It was good science that informed managers that bald eagle populations were still declining precipitously, despite the 1940 Bald Eagle Protection Act that prohibited killing or selling of bald eagles. It was good science that showed that DDT and other organochlorine pesticides were causing the shells of the bird's eggs to thin, reducing nesting success. Science also disclosed that loss of good nesting habitat also was contributing to the population's decline. These important data provided a solid foundation for management and policy actions that ultimately resulted in the recovery of the bald eagle.

But science isn't free and to conduct research, one needs money. This is a picture of Mercury astronaut John H. Glenn, Jr., suited in full Mercury suit. His 1962 flight in the Mercury Atlas 6 "Friendship 7" spacecraft marked America's first manned Earth-orbiting space flight. The cold war with the Soviet Union was at its height. That same year, on September 12 during a speech given at Rice University, President Kennedy made it a national priority to develop a space program that would put Americans on the moon. From this modest technological starting point, Kennedy challenged NASA to send a man to the moon by the end of the decade. Seven years later, on July 20, 1969, Neil Armstrong and Buzz Aldrin set foot on the moon, fulfilling this direct goal along with the dreams of countless people through the ages.

To pay for this accomplishment, in 1961 dollars the nation was investing around \$5B annually, or some 50 cents per person per week. This amounted to around 5% of the Federal Budget at the time. The successes of Apollo showed that given the motivation and funding to back it, we can do the science needed and not even the sky proved to be the limit.

These are new laser-guided smart bombs as seen here being dropped from a F-15 Strike Eagle. They are designed to hit within 3 meters of their designated target. According to the US Department of Defense, strategically placing such bombs reduces non-target human mortality and keeps US forces out of harms' way. Now I had several uncles who were bomber / navigators during World War II. At that time, such technology was not even a component of science fiction.

Why do we have such technology? Because somebody felt it important enough to put the money into developing it. Each one of these bombs cost about \$250,000 to make. What did R & D cost? The Defense Advance Research Projects Agency or DARPA approximates that there is usually a 15 year split between a Broad Agency Announcement for technology and use in the

field. I don't know what that 15 years of research and development cost but I imagine the annual budget was more than the ballpark \$25 million dollars a year that is coming in from Environment Canada and associated partners to enact the Georgia Basin Action plan.

To achieve a vision of improving the health of the Puget Sound Georgia Basin Ecosystem, we're going to need to increase our spending. But I caution you, science and the money to perform that science alone will not fix our problems. Just as science is linked to money, POLICY is linked to the use of science.

Scientists at the US Geological Survey released a 29 page report by Griffith et al. entitled "The Porcupine Caribou Herd" in which the authors used 5 published hypothetical development scenarios to estimate the potential effect of oil development on calf survival during June for the declining Porcupine caribou herd. Using 15 years of data on concentrated calving areas for the herd and modeling displacement scenarios by the minimum distance needed to provide 4km clearance from the roads the authors predicted a reduction in calving success as displacement increased and concluded that allowing North Slope oil development to expand onto the coastal plain of the Arctic National Wildlife Refuge would 'most likely' restrict the area available for caribou calving, leading to impaired reproduction and calf survival for the porcupine caribou herd. This work echoed an earlier report by the Porcupine Caribou Management Board. This large, migratory herd moves between the U.S. and Canada is vital to the traditional subsistence cultures of numerous native villages in both countries.

Despite this science produced by her own agency, the Secretary of the Interior Gail Norton wrote to Congress, "I believe that we can ensure that any exploration and development of the oil and natural gas reserves in the 1002 Area of ANWR can be conducted in a manner that is protective of the environment and minimizes impacts on wildlife in the area."

You see good science that is not used or a political agenda that turns its back on science will not result in good decisions. Now I'm not a student of politics, but just for kicks I **would** like to give you my translation of Secretary Norton's response in light of observations I have made about our current administration's use of best available science. What she meant to write to congress was, "God wants us to drill in the Arctic National Wildlife Refuge, so science or no science, by God we're going to do it!"

In addition to science, and the money to conduct that science, and the political will to use that science, recovery of the PSGB region will also require broad based community education and support for required action. You see, no matter what some people think, you can't legislate morality.

Unlike the Pacific Northwest, people no longer travel to England to catch Salmon. Scotland maybe, but not England. But they were there once upon a time. And in David Montgomery's book, King of Fish, he gives a nice example of what I'm talking about; the importance of stewardship. In the early 1700's George the First recognized the need to protect salmon. Being the king he in 1714 he enacted a law to prevent blocking salmon from their spawning grounds in seventeen English rivers. Six years later the first modern factory, a water-

powered silk mill, was built along a salmon stream in Derby. By 1868, all seventeen rivers protected by George I were either blocked or poisoned by pollution.

But you see, something I've forgotten to bring up so far today is that for over 8,000 years, the Puget Sound Georgia Basin has been inhabited; inhabited by people who for 8,000 years didn't need Galileo to tell them that they needed to just observe to learn. And for 8,000 years these Coast Salish people have been developing a knowledge of our ecological systems that is so complete we are remiss to NOT learn from it and incorporate it into planning for a sustainable future.

And these people also give us a great example of the value of stewardship. For years, a Canadian Geologist named John Harper had been seeing these apparent man-made structures from the sky as he mapped the region's shoreline. And after years of study, he's come to realize that these, like you see here from the Broughton Archipelago, northern Vancouver Island, are clam gardens. Removing the cobbles & boulders makes it easier to clam next time, and moving them down toward the water is easier than moving them up onto land. It also creates more calm habitat as small clams don't grow well under cobbles and boulders. By creating a ridge, sand and shell fill in creating a sand terrace that is EXACTLY the right height for clam growth so you're creating more clam habitat at exactly the right elevation. Now this is one on Valdez Island in the Canadian Gulf Islands. AND probably most importantly, according to Dr. Harper's theories, the stone walls designated ownership. And with ownership, comes an incentive for a family to have a sustainable yield and not over-harvest. This is really the earliest form of stewardship.

Ecologically, the Puget Sound Georgia Basin is as complex as it is unique. Within an ecosystem, there are uncountable numbers of variables that interact. If we add social, political, and economic interactions into trying to understand our region, the complexity dwarfs our ability to comprehend. But what we do know is that science and observation, including traditional ecological knowledge, provides us with information upon which we can base management and personal stewardship decisions. But as I've shown you, it takes money to conduct science and a political will to use that science for the long-term betterment of the resource and the population and not the short term interest of an administration or a special interest group that stands to benefit from over-exploitation. And finally, the data produced needs to be translated and shared with the general population so that they may be inspired to know and care, and utilize the information in their daily decisions.

But remember, science and attitude shifts occur slowly. In the not too long distant past Fisheries department personnel in British Columbia were encouraged to opportunistically shoot killer whales. In a 2001 paper by Hoit, the overall whale-watching industry was estimated to be \$13.6 million dollars in Washington and \$69 million in British Columbia (Canadian dollars). A regional flagship conservation species, we not have well coordinated transboundary efforts to recover the southern resident killer whale population. Why the change? Science, political will, stewardship and education. No longer viewed as wolves of the sea, science taught us we could identify them individually and soon people became enamored with their complex close-knit social structure as well as their physical beauty. Close monitoring and scientific studies alerted us to declines in the population, high levels of persistent organic pollutants, and other issues. Political will has produced money to better understand problems and restore the population. We

haven't succeeded yet, but we must celebrate that we now see killer whales as a flagship conservation species and not a target for high powered rifles.

So as you enjoy this weeks research conference, please take a look around and enjoy that although this research conference started as a science conference and stands as the region's premier science conference, it also has evolved to fill our need to lobby for more money, for political support for all of the efforts going on in the region, for education and stewardship of the population, and for our interest in working closely with our transboundary partners as well as the Coast Salish peoples that are now sharing the basin with us.

And as a final note, I urge you, don't forget to celebrate the small victories. In a time where pending crisis seems eminent, we must remember to step back often and pat ourselves on the back. In the 1970's lingcod populations in Puget Sound proper were low, prompting an almost complete moratorium on fishing from 1978 to 1982. Re-opening of the fishery with minimum and maximum size slots and a one fish daily bag limit have continued to grow the population. In the North Sound area, populations seemed healthy in the 70's and early 80's, but declined in the late 80's and early 1990's. A nine-month fishery with a daily bag limit of 2 was restricted to a 6-week fishery with a daily bag limit of 1. Since 2000, ling cod fishing has substantially improved in the San Juans. And WDFW dive data, while showing increased populations at both fished and unfished sites, have shown phenomenal lingcod densities within no-fish reserves in North and South Puget Sound!

I hope you enjoy the conference and continue to work on the multi-faceted effort to improve the health of the shared Puget Sound Georgia Basin. While you're here this week, please take note of all the good work going on and take the time to pat yourselves and others on the back and celebrate the small victories.

Thank you!

Joe Gaydos
Regional Director, SeaDoc Society
www.seadocsociety.org

