The Integration of Indigenous Traditional Knowledge and Science in Government Policy Development. How best to integrate Indigenous Traditional Knowledge and science into government policy development; how to resolve conflicts between the two knowledge systems. Jeannette Armstrong, OC, PhD.

While I realize the topic is much broader, I can only speak about and share examples from experiences I have been fortunate to be part of. The first example I draws from is as co-principle investigator of a research project titled *Enhancing Ecosystem Sustainability: A Syilx/Settler Science Collaboration.* The second example I draw from is as co-investigator in a current project entitled the *Watershed Ecosystems Project.* I also draw from experience in my ten year role as Canada Research Chair in Okanagan Syilx knowledge and philosophy.

The two projects are University of British Columbia Okanagan Eminence research projects that brought together Syilx Traditional Ecological Science and Settler Science. Both partnered with En'owkin the Syilx Centre for Higher Learning, mandated by the seven reserves of Syilx Nation.

The En'owkin traditional ecological team led in organizing and planning the activities based in selected areas of special environmental concern identified by the Chiefs of the Okanagan Nation Alliance to reconcile food insecurity in the decline of cultural keystone species.

The En'owkin team brought knowledge keepers from the seven communities. My role provided a way to cross translate from my academic expertise and as insider to syilx knowledge, to clarify areas esoteric to each. I would advise that doing so is an essential prerequisite in easing tensions between two systems of knowledge.

The Syilx concern in the decline of the Grizzly Bear related in specific ways to the declines to black huckleberry in grizzly habitat corridors was one focus of research. So success is measured by the Syilx in the two communities with the En'owkin Centre team now in a process of identifying specific priority corridor areas for Indigenous protection.

Putting back the Okanagan Chinook Salmon and the connection to the valley floor's black cottonwood river riparian systems was another focus. Success is therefore measured in the partnering work between En'owkin Centre, the Okanagan Nation Alliance and the Penticton Indian Band to create a Chinook recovery pond and return a cottonwood floodplain section of the river that had been channeled since the 1950's.

Teaming up Syilx and settler science researchers and community partners to develop a watershed ecosystem-based science and governance model is the focus of a new interdisciplinary and community-engaged research project. Indigenous syilx rights, knowledge, and water law are integral in the pilot study focused on one community watershed. Success is being measured by the localized solutions-making emerging with two Indigenous community jurisdictions.

The main outcomes of both projects, significant to this presentation, is in how settler science tools were to be engaged to establish and expand on-going Syilx works as way to envision new works in environmental protection, conservation and recovery.

Both projects involved Syilx expertise in ecosystems science related to specific places and select species that were of mutual concern to work together on.

Syilx expertise in long-term patterns of change takes into consideration the complex interactions formed as a result of the general local conditions of climate and terrain, basic to being part of the land. Science expertise based in essential to harvesting practice is unique to Syilx Indigenous ecosystem sciences. Specific local conditions relate to soil types, to the orientation of wind pattern, to sun exposure and water scarcity or abundance, and to the seasonally charged effects on resident and migratory populations. Such information is precise and current from year to year and builds lifelong observed knowledge in situ. These expertise areas were relevant in both projects and essential in re-imagining how to reconcile tensions between the two knowledge systems.

The collaborations opened new ways for Syilx specialists to develop specific Syilx science frameworks for integrating settler science tools. Such collaborative approaches with Indigenous experts have the potential to address ecological issues that individual governments and their agencies cannot address in isolation of place-specific expertise.

I emphasize that Syilx traditional ecological knowledge is a distinct science, with specific systems expertise in the land and waters they are a part of. So engagement in a collaborative process required on-the-ground work to team up with their specific knowledge expertise in ways that prioritized Syilx led environmental initiatives of mutual interest.

Important to this presentation is to highlight that without a specific process organized to sensitize and educate both the science team members and the syilx knowledge experts, in the differences between both sciences and in the benefits of bringing them together, it would not have produced the same results.

Necessary to both systems is the *how* in the process to clarify the distinctive considerations required by each knowledge system. Within such collaborations the different partnering jurisdictions required alignments in their differing purposes in what the outcomes are to be.

Indigenous science knowledge is held collectively in a wide variety of different ways in each of the huge diversity of lands and waters Indigenous peoples live in. It is in the way Indigenous systems knowledge is produced and held as specific to places of constant use and observation, that is reproduced through countless generations that underlines its preciseness and reliability for environmental solutions-making.

From these examples I would advise that Indigenous communities who are continually using their lands and waters throughout the seasons have unique kinds of expertise different from those no longer actively living *in situ* on lands and waters. This differentiation is important to make in environmental science applications when collaborating with Indigenous expertise in specific places. Such Indigenous science expertise must have its own place in policy for environmental solutions-making to benefit by it.

Indigenous science knowledge systems are unique to specific places so developing policy that requires measures in how to collaborate for environmental problem-solving is necessary. Policy

changes are needed to increase capacity and incentive to establish process from within the requirements of Indigenous expertise knowledges, where it exists in situ, to insure it is based in and supports Indigenous jurisdiction.

So this presentation is not about two-eyed seeing, it is about collaborating with real people who have their own areas of science expertise that differ in method, approach and application. Not understanding that principle is what has to be reconciled between the two knowledge systems in application.

It is also not a matter of integrating Indigenous knowledge into a science-based approaches developed and managed by external methods, process and intent not in alignment with Indigenous purpose.

Developing new policy will need to bring this kind of Indigenous science expertise together to articulate principles of collaborative engagement with Indigenous science specific to place for environmental solutions-making.

Policy development will require principles for Indigenous science expertise to exist in its own right in its different forms related to place, free of overriding interests from pressures to conform or standardize to settler science expectations in application. Such collaborations in that way must be aligned with and sanctioned through their Indigenous communities.

Policy is required for the development of systems to authenticate Indigenous science knowledge as living in situ. Such measures are more clearly relevant in this time when government and academic institutions are increasingly under scrutiny for erring in such things.

I wish the standing committee all success going forward and offer any further input should that be desired.