

Water-based ecology: A First Nations' proposal to repair the definition of a forest ecosystem

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Abstract

First Nations Elders are very concerned about whether enough clean drinking water will exist for future generations. Three highly respected Elders from the Southern Interior of British Columbia helped the author investigate First Nations water-based ecology: Mary Thomas from the Secwepemc (Shuswap), Millie Michell from the Nlaka'pamux (Thompson), and Mary Louie from the Syilx (Okanagan) Nation. This paper follows on from the author's previous examination of First Nations' spiritual and ecological perspectives on water (*BC Journal of Ecosystems and Management* 1(1):54–68). The Elders' vision of the relationships between water, land, and animals highlights an apparent shortcoming in Western science's definition of an ecosystem. In this paper, the author encourages a shift towards *water-based* ecosystem management, proposing to repair of the definition of forest ecosystems in a way that interweaves First Nations' philosophy with Western science's ecosystem-based management approach.

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Continuing the First Nations Dialogue on Water

First Nations Elders are very concerned about whether enough clean drinking water will exist for future generations. This paper follows on from my previous discussion of First Nations' spiritual and ecological perspectives on water (Blackstock 2002). Here, I continue to investigate First Nations water-based ecology with the help of three highly respected Elders from the Southern Interior of British Columbia: Mary Thomas from the Secwepemc (Shuswap), Millie Michell from the Nlaka'pamux (Thompson), and Mary Louie from the Syilx (Okanagan) Nation. Their vision of the relationships between water, land, and animals highlights an apparent shortcoming in Western science's definition of an ecosystem. Drawing on their experience and wisdom, I encourage a shift towards *water-based* ecosystem management by presenting a proposal to repair the definition of forest ecosystems. This new definition interweaves First Nations' philosophy with Western science's ecosystem management approach.

Water: Spiritual and Ecological Perspectives

Water is at the heart of the Elders' vision of an ecosystem. Rain, snow, springs, wetlands, lakes, and rivers are the lifeblood that circulates through the ecosystem, providing sacred and profane sustenance for all beings. Olivia Buck, a Nlaka'pamux youth, believes that we are borrowing clean drinking water from future generations, and thus we are also implicitly accepting the responsibility of returning water in as good or better condition (Olivia Buck, personal communication, 2001).

Mary Thomas: I'm really concerned about the water; that's one of my biggest concerns with the environment. That's why I thought, gee, if you're going to do anything that will make people aware [about the environment], then we need to do something about the water. For example, the poor guy when he came to sell me drinking water, I told him I never thought I'd see the day that I'd spend seventy dollars a month for water! His face just went beet red and he said, "You know I feel really sad having to do this. But it's a must." And I said yes I know. Because I'm right at the end of the city water line, we don't have a thing to flush it. And you can see silt in the water in the house—I don't care how they try to purify it, there's always a certain amount of silt. So it's gathering up,

The Elders' vision of the relationships between water, land, and animals highlights an apparent shortcoming in Western science's definition of an ecosystem.

gathering up; you pour a tub full of water and you can see the silt in there. I'm not that dirty!! [laughter] (Mary Thomas, personal communication, 2000).

The Elders emphasized how important it is to understand the spirituality of water—water has a spirit with which they converse and pray. Water is alive—it is biotic. Historically, water seemed to have a significant "life giving" importance in Western thought, but today it exists as an unorganized, non-thinking or un-willful grouping of molecules in the physical world. Western science defines an ecosystem as: *the complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space* (Encyclopedia Britannica.com 2002). Water is not explicitly mentioned in this definition, rather it is enveloped in the concept of the physical environment (i.e., as inert matter, such as soil, which interacts with the living world). How would ecosystem-based management theory change if we were to assume that water has the dominant role in the "living community"?

Mary Louie: The water is the biggest part of all our lives; without it, we'd never survive. So when you go to the water and you talk to that water, that water helps you. But you have to come from the heart with it, with your words. If you go to the water early in the morning and get into it before anybody's up or around, that water will strengthen you because your spirit cries for that water, not just your shower or your tub water, it's tired of the hot water; it wants cold water (Mary Louie, personal communication, 2000).

What is water? Clearly, there is a difference between First Nations' and Western science's perspective of water and its role in an ecosystem. This difference, if left unexamined, could lead to cross-cultural misunderstanding and disputes over forest management planning and the perceived effects of the resulting ecosystem intervention.



Ducks Unlimited Canada



Joyce Sam



Michell Family



Top: Secwepemc (Shuswap) Elder, Mary Thomas;
Middle: Syilx (Okanagan) Elder, Mary Louie;
Bottom: Nlaka'pamux (Thompson) Elder, the late
Millie Michell.

Science is a way of knowing, a cornerstone of Western epistemology. Science has served the needs of an evolving society well, but not without its limitations. The taxonomic lens of science has created a chasm between the living and non-living components of our world—and water has unfortunately been placed on the non-living side. Science relies on accurate observation of cause and effect relationships over a measured and appropriate period of time. I define Traditional Ecological Knowledge (TEK) as: “a particular First Nations cumulative and evolving body of knowledge, attained over long periods of time, of their sacred and secular relationships between living beings in a variety of ecosystem types” (Blackstock 2001). First Nations have continually observed and orally recorded the changes in the land for the past 10 000 years. The three Elders involved in this research project have all reflected back on how ecosystems functioned many generations ago, and also on the subsequent changes to these ecosystems. Their way of knowing places water in the living world, and they have observed that water is drying up and that the land is becoming unhealthy. Perhaps Western society’s desire to achieve sustainability is hampered by its potentially flawed definition of an ecosystem. First Nations have observed a crack in one of Western society’s theoretical cornerstones—the ecological approach to a sustainable environment.

During the interview with Elder Millie Michell, she asked me, “Are you going to fix it?” Millie grew up with knowing and using her traditional teachings about respecting water. Her grandparents and parents taught her to respect everything, and she says we do not teach our children today. In her childhood, they had to pack water for bathing, drinking, cooking, and making tea. *I believe what she meant was, are you [the children, in her eyes] going to fix what is happening to the earth?* And then Millie continued talking about how important it is for children to learn to respect the water (Millie Michell, personal communication, 2000).

Repairing the Definition of “Forest Ecosystem”

If TEK and science are to coexist, then the Western science definition of forest ecosystem should be ‘repaired’ with a new emphasis on the role of water. For instance, ecologists in British Columbia define a forested ecosystem as: “. . . a segment of landscape that is relatively uniform in climate, soil, plants, animals, and micro-organisms . . . The biotic community of a site is composed of a combination of plants (vegetation),



animals, and microorganisms, each of which forms its own community” (Klinka *et al.* 1989:4). Repairing this definition would clearly symbolize a cross-cultural understanding to the question posed earlier: “What is water?” By incorporating this understanding, a revised definition could read: “. . . a forest ecosystem is a segment of landscape, composed of relatively uniform climate, soil, plants, animals, and micro-organisms, which is a community complexly interconnected through a network of freshwater hydrological systems.” Water is always moving, and thus it has the ability to function as the connecting component, or “blood of life.” Consequently, ecosystem community relationship diagrams (topological representations of the interrelationships) would change from an unfocused network to a spider-web network with water as the heart that pumps the blood of life throughout the community.

Mary Louie: That’s what I call this term “the blood of life” to Mother Earth’s children and without it we’d never survive. So we need that water, and we need to keep it clean. A person would buy a new pair of shoes and would wear it right down to nothing before they’d get to that clean water. That’s one of those things that the ancestors talked about [a prophecy]. So that’s why I’m saying that we need learn to preserve water. And that the mining should be cut off all together. They’re digging her and hurting her, but yet they’re taking the life out of her by doing that. ‘Cause all of the ore, silver, the gold, whatever they’re drilling for, that’s part of hers. That’s part of ours as well because we all are connected to everything that’s been created. Without that we won’t be in balance, because we need that mineral, we need that water, we need that fire, we need that clean air to be in balance. When they start monkeying around with that, that’s why everyone is getting sick. We don’t have cures for that (Mary Louie, personal communication, 2000).

The Implications of Redefinition

How would this new definition affect theory and practice? First, it would help us define a healthy ecosystem as one in which water, of sufficient quality and quantity, is delivered in a functional rhythm (Blackstock 2001). Water is essential for the existence of life. “Almost every plant process is affected directly or indirectly by the water supply”, more than any other single environmental factor (Kramer 1983:1–2). In some cases, the

ecological health of a forested watershed can only be maintained by minimizing significant human interventions, such as harvesting. Ecosystem integrity, defined by the Vision for Water and Nature Project, is the “. . . range of interactions between the water cycle, individual species and biophysical, chemical and ecological processes that support the organization of an ecosystem.” This suggests that the ecological health or integrity of freshwater ecosystems can be preserved by maintaining “the hydrological characteristics of catchments, including the natural flow regime, the connection between upstream and downstream sections (including coastal and marine zones), the linkages between groundwater and surface waters, and the close coupling between the rivers and floodplains” (World Conservation Union 2000). Ecosystems, such as upper catchment cloud forests, springs, and certain wetlands, directly provide us with clean water and help to regulate flooding and basic ecosystem functions.

Mary Louie: If you take your water and put it in a jar and cover it, then close it, in two days you’ll see things in there. That’s from the chemicals they put in there. It lines your pipes and . . . coats your showers and your toilets. But the water, it’s a gift of life. It bothers me because our water is going down . . . disappearing because it’s not being respected [pulled away from human access by Mother Earth in retribution for disrespect]. People won’t offer gifts to the water anymore, you know; they don’t take food to it, or tobacco. All they’re used to is just taking and taking and taking; they don’t know how to give back. They’ve never learned to balance things, huh? (Mary Louie, personal communication, 2000).

Second, researchers would need to acknowledge and respect water’s special place in the ecosystem. Researchers have contributed greatly to our understanding of the connections between organisms in the ecosystem; however, this understanding would be more complete if they described these connections in the context of water’s ability to make the connections possible in the first place. For instance, Goward and Arsenault (2000) discovered a connection between *Populus* species, conifers, and cyanolichens. Conifer bark is enriched by the rainwater that drips off the leaves of *Populus* species in the canopy above. The bark enrichment process creates a substrate on which cyanolichen can grow; the cyanolichen, which are nitrogen-fixers, then indirectly enrich the soil. The role of water (in this case, rainwater)



was not emphasized by the researchers, but presumably would be if the work were governed by the new definition of forested ecosystems proposed here. Similarly, Simard *et al.* (1997) discussed the connection between trees of different species through the common mycelium of soil mycorrhizal fungi. Simard found a “tightly linked plant–fungus–soil system.” This has prompted forest managers to change their impression of paper birch (*Betula papyrifera*), which was once thought of as a “weed” species. Douglas-fir seedlings grow in a reciprocal relationship with paper birch—a net positive transfer of nutrients exists between each species through a soil mycorrhizal fungi network, which allows water to transport the nutrients across species gradients (Simard *et al.* 1997). However, the researchers did not emphasize the role of water here either. Researchers should be encouraged to design their studies with the assumption that water has an interconnecting role in the ecosystem, and also to enquire into the questions posed by the Elders such as:

- Is groundwater drying up because of harvesting?
- Does the forest act as a groundwater pump bringing water into the rooting zone and tree trunk?
- Does livestock fecal matter significantly contribute to deteriorating water quality?
- Are there fewer wetlands now compared to a couple of generations ago?
- Is water enriched with energy while it travels through photosynthetic hydrological systems (as Mary Thomas believes happens in birch trees).

Mary Thomas: I talk about the birch tree as an example . . . you know my Elders told me that anything that grows has its own aura—it’s its spiritual strength. I was reading a book about some monks who were studying some spiritual way in Peru. And it surprised me: we talk about the same thing . . . we talk about our medicine man—when he practised his medicine powers he always went to the water. He swam morning and night, morning and night, morning and night (Mary Thomas, personal communication, 2000).

And lastly, forest management practitioners, working with this revised definition of forest ecosystems, could

base their management activities on the assumption that water is the primary component of an ecosystem and that a healthy ecosystem is one in which water, of sufficient quality and quantity, is delivered in a functional rhythm. The first question forest managers need to ask is: “how does this planned intervention affect water?” Throughout their daily practice, they need to acknowledge the special role of riparian and wetland ecosystems, regardless of their size¹. They also need to “give back,” meaning that a high priority should be placed on restoration. A proportion of the profits from resource extraction should be used to restore or improve water quality and quantity. Foresters, ranchers, and other renewable resource managers need to refocus their purpose under this revised definition. The primary product they manage for, under a water-based ecosystem approach, is clean water, and if successful, they can ensure a sustained delivery of secondary products such as timber, livestock, and fish.

A Shift towards a Water-based Ecosystem Approach

David Rothenberg, the co-editor of the enlightening book *Writing on Water*, describes the ability of water to unite: “Water does not divide; it connects. With simplicity it links all aspects of our existence. We feel its many meanings” (2001, xiii)². Elders’ TEK is a relationship based philosophy; water has the primary connecting role which they characterize as the blood of life. Peter Warshall, who writes on ways to harmonize watershed flows with human communities, believes “water is life” and that “a healthy water supply supersedes all other economic and legal dictates” (2001:45). Warshall reflects on the two-thousand-year-old Chinese philosophy of Lao-tzu and writes: “Lao-tzu’s great contribution to watershed governance was this: *Always give priority to water over human interests*. No matter how charming human ideals, poetics, political rhetoric, divine revelations, promises, or factoids, hydrophilia is the best consensus builder” (2001:50)³. In British Columbia, many cultures reside in, and rely on, the vast diversity of watersheds within its provincial bounds. Thus, these cultures must come to a consensus on the question: *What is water?* The Elders have offered a perspective

¹ The Forest Practices Code currently defines a wetland as being greater than one hectare in size, but First Nations are also concerned about those less than a hectare. This is an example of miscommunication. A forester may say, “I have considered wetlands in my plan,” not realizing the First Nation is concerned about the ones not fitting the forester’s definition of a wetland.

² The term “unite” is meant for the ecological context and not for the geo-political one, which is fraught with disputes over rights to water access.

³ The term “hydrophilia” is defined as the love of or friendship with water.



that, upon interpretation and comparison, highlights a possible shortcoming in Western science's view of water and its role in the forest ecosystem. As borrowers of water, we should seek a cross-cultural consensus, and thereby ensure a healthy supply of water for future generations.

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