

Ecosystems are Health Systems

There is a sizable contingent of individuals and governments reawakening to the importance of the global environment for the survival of all beings in the past, present and future. This recognition very often manifests through interests and actions on specific threats like emerging infections, microplastic pollution, or biodiversity loss. Strategies very often focus on pinpointing causes, removing risks or doing less harmful things without equal attention to approaches that can heal, restore and regenerate the ecosystem upon which health depends. Too often, “the environment” is seen by health professionals as an adversary rather than an ally, a thing to control, rather than something we are part of.

Ecosystems are health systems. Western science defines ecosystems as a community of living organisms (ex. plants, animals) interacting with each other and their non-living environment (ex. land, water). Indigenous peoples recognize this community of interactions but instead almost universally view land, water, plants and animals as living beings, who have spirits and are relatives.

Environmental resilience is an ecosystem’s power to resist or recover from major changes following disturbances, without undergoing changes that are very difficult to reverse and undesirable to the beings that comprise the ecosystem. Environmental resilience determines how all beings grow, live, and age. It affects the chance of illness, and the ability to meet life roles and expectations. Resilience thinking asks us to build flexibility and adaptive capacity to adapt, recover and thrive into an uncertain future rather than attempting to achieve stable and optimal states through short-term gains.

A socio-ecological resilience perspective of health shifts us away from only focusing on individual risk factors to systemic and structural influences that support the health of the whole. Socio-ecological thinking in health is not new, it is a revival of perspectives that have been lived out across what is now called Canada, by Indigenous peoples, for generations upon generations. In 1986, the Ottawa Charter for Health Promotion took some steps to realizing this perspective (Thompson et al 2018). It emphasized that a stable ecosystem and sustainable resources were fundamental conditions for health. It stressed the need to create supportive environments. The Charter motivated interest and investment in managing the built environment and human ecology, but less so for more-than-human ecology and non-built environments. There is growing acknowledgment that the health of all species is a cumulative effect of interdependent animal, social and environmental determinants (Bircher and Kuruvilla 2014, Wittrock et al, 2019).

Around 2004 western veterinary and public health took some steps towards integrated socio-ecological thinking by adopting the term, One Health. However, like environmental health, One Health has tended to emphasize threats like zoonoses, pollution, and extreme weather with comparably little attention or investment in working for environmental protection to sustain the attributes upon which life depends such as clean air, watershed security, and habitable climate (Gallagher et al 2021; Meiser et al 2024).

The rate, interconnections and diversity of threats to resilient ecosystems are making a problem-by-problem approach increasingly incapable of protecting the health of living beings today or in the future. Problem-by-problem approaches not only often neglect root causes and interconnectivity of problems but also rarely invest in restoring and retaining the health resources and options for adaptability provided by resilient ecosystems. Resiliency bolsters the power to deal with what may come and is less sensitive to etiology than typical animal and public health approaches. Socio-ecological resilience strategies emphasize plans and actions to restore and build the power of ecosystems - such as watersheds - to absorb disturbances and maintain their essential functions.

We want to bring attention to the viability and feasibility of restorative and regenerative interventions, where humans work with ecosystems, to maintain access to the determinants of health and adaptability required by beings and generations sharing the same place. We illustrate this by focussing on water and watersheds. Water was selected because, (i) water is required by all beings, (ii) watershed security is being affected by land use practices and droughts (iii) increased frequency and severity of droughts are affecting ecosystem function, food security, animal movement patterns, and economic activities (iv) water scarcity is expected to increase along with climate change, population growth, urbanization, aging infrastructure and rising demand from energy and technological industries and (v) climate change is anticipated to increase water scarcity and watershed insecurity concerns in Canada for the foreseeable future.

Healing watersheds as an intervention for the planetary polycrisis

Watersheds sustain health through daily interactions at the local level. Numerous watersheds are nested within each other, with smaller watersheds draining into larger ones. Watersheds are delineated by the topography of Mother Earth. Three examples below (in place for 15 years, 4 years and proposed, respectively) denote how integrating worldviews into governance and/or strategy has potential to promote approaches that can heal, restore, and regenerate the watersheds upon which planetary health depends.

1. Local level – De-centering humans

The Cowichan watershed is located on southern Vancouver Island, British Columbia (BC) and has been home for the Quw'utsun peoples¹ for generations upon generations. The watershed provides water and food security for many beings, across many generations. The watershed's forests, lake and streams support emotional, mental, physical and spiritual health. The watershed is the home to abundant vibrant communities that include wild biodiversity and agriculture. After years of pressures, including deforestation, agricultural practices, urbanization, and climate change, critically low river flows sparked a collaborative governance partnership between Cowichan Tribes and the Cowichan Valley Regional District. The Cowichan Watershed Board (CWB) makes the well-being of migrating salmon a key focus, through incorporating Quw'utsun teachings and proper ways of being such as "*Stl'atl'um stuhw tun kwunmun* - Take only what you need" and "*Hiiye'yutul tst'u to' mukw' stem 'i 'u tun'a Tumuhw 'i' tu qa'* - Everything in the natural world is connected as part of our family; we are all relatives". Taking an 'all beings-all generations' approach led to progress in designing BC's first major infrastructure project to support river flows for the health of a river, rather than human/industrial use of a river; supporting BC's first Water Sustainability Plan to be watershed-based; and improving Chinook salmon returns in the Cowichan River.

2. Provincial level – Wholistic decision-making

There are 12 major watersheds, in what is now called BC, that have been the lifeblood for the First Nations calling this place home for generations upon generations. The challenges these watersheds are facing prompted the formation of the BC-First Nations Water Table, with delegates from First Nations (from across the major watersheds) and BC government ministries (with responsibilities for fresh water) working together to protect watersheds, aligning with BC's Declaration on the Rights of Indigenous Peoples Act. Key focuses of the BC-First Nations Water Table have been co-development of a Watershed Security Strategy² (a transformative approach to watershed stewardship and shared decision-making to ensure clean, safe water, healthy ecosystems, and resilient communities for generations), supporting a framework for watershed governance reform and co-stewardship of a Watershed Security Fund. This \$100 million fund is for investment in communities' shared reliance and the need to care for the natural world and the water we all depend on, by enabling diverse interests to work together to support and strengthen watersheds now and for future generations.

3. National level – Incorporating more dimensions

¹ Current band government is Cowichan Tribes.

² The BC government did not release the Watershed Security Strategy.

The current national standard for drinking water protection looks to ensure safe drinking water by limiting microbial, chemical and radiological contaminants through a multi-barrier approach. These standards deem water as a source of risk that we must be protected from rather than a foundation for the health of all beings and all generations that we have a responsibility to protect.

Integrated watershed management focuses on the inter-relationships of water and related biodiversity and ecosystems, and the broader socio-economic systems which they support. It protects water sources by coordinating land and water use across an entire watershed, balancing long-term water quality, quantity, with environmental, social, and economic needs through collaboration. The Comox Lake Watershed Protection Plan (Aqua-Tex 2016) is an example of an integrated approach for the long-term protection of drinking water at the highest possible quality. The plan recognizes that high quality drinking water is produced by a healthy ecosystem that captures, stores, and releases water while moderating or removing sediments, pathogens, parasites and excess nutrients. It acknowledges that humans are a part of a watershed and that

proper functioning wetlands possess the ability to support greater biodiversity.

Socio-ecological systems that are whole, healthy, and sustainable are the foundation for multisolving; a term used to address multiple problems with one policy or investment. Moving water standards beyond layered physical barriers, to incorporating emotional, mental, spiritual and ecological dimensions can move us to a multi-dimensional, multisolving approach. Such transformation in thinking could better allow us to adapt, recover and thrive into an uncertain future and better support the health of all beings that depend on our watershed ecosystems.

Conclusion

Health equity across many beings, over many generations, can better happen when the actions we take to protect the health of one species or generation, does not impede the chances of others to achieve their full health potential. Managing environmental threats using a problem-by-problem approach is insufficient to protect the health of all living beings into the future. Working with nature as a health ally allows us to build flexibility and capacity to adapt, recover and thrive into an uncertain future. Our case studies show how shifting the narrative away from nature as source of harms to “ecosystems as health systems” opens new ways to think about and act collectively to promote health equity across species and generations.

References

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