



Blue
Ecology

November 2024: Asset Management BC

Git^uxsan: People of the River of Mist



"The blood that runs through the veins, are the rivers that run through Mother Earth. People need to understand that, without that life giving water, there will be nothing."
(Chief Gwininitxw, Yvonne Lattie, Gitksan Nation)

Outline



Acknowledgements: Elders



What is water?



Blue Ecology's Vision & Attitude Change



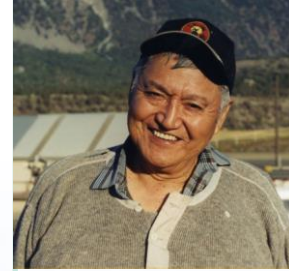
Natural Intelligence



Hope

Healthy **water** = healthy **environment** = healthy **body**

Acknowledging Elders



Research Question: What is Water?

A Deceptively Simple Question...

Western Science's definition

Water is a chemical
compound consisting of two
hydrogen atoms and
one oxygen. The name water
typically refers to the liquid
state of the compound
(Chemistry @About.com).

Hydr-Hydro –Greek root for “water”

What is Water?

Mystery of water

75 anomalous properties, where liquid water is different from other liquids

“Life on Earth as we know it would not exist if water was a regular liquid”.

Kananenka and Skinner, 2020

Source: Martin Chaplin, London South Bank University

What is Water?

A Deceptively Simple Question...

UNESCO's Definition

**Water is the essential
lifeblood of our planet,
with the power to
generate, sustain, receive
and ultimately unify life**
(UNESCO-IHP Expert
Advisory Group on Water
and Cultural Diversity).

Comparison of water views

What is Water?

WESTERN SCIENCE

- Taxonomic/distributive
- Hierarchical
- Water is abiotic, non-living
- Water is a physical material that assists the living organisms in an ecosystem
- Rarely a value component (VC)

Comparison of water views

What is Water?

INDIGENOUS

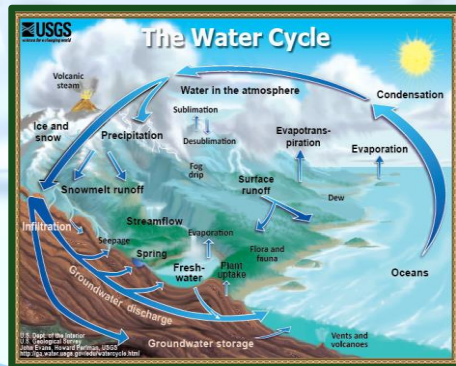
- Integrative
- Water unifies life
- Water has a spirit (biotic)
- Water is a central value, the heart of an ecosystem pumping the life blood
- Groundwater is very important: can offer spiritual and healing power

Two Water Worlds



Blue Ecology Water Cycle

- Companion to Western Science's model



Western Science's Hydrologic Cycle

- (USGS version)

Unique to Blue Ecology?

Interweaving

- *Collaborative process* where apparently contradictory ways of knowing water, such as Western Science and Indigenous Knowledge, are brought together as *coexisting threads* to produce a new cooperative theory called Blue Ecology.
- Coexisting knowledge systems working in tandem, in balance

Interweaving is not consultation

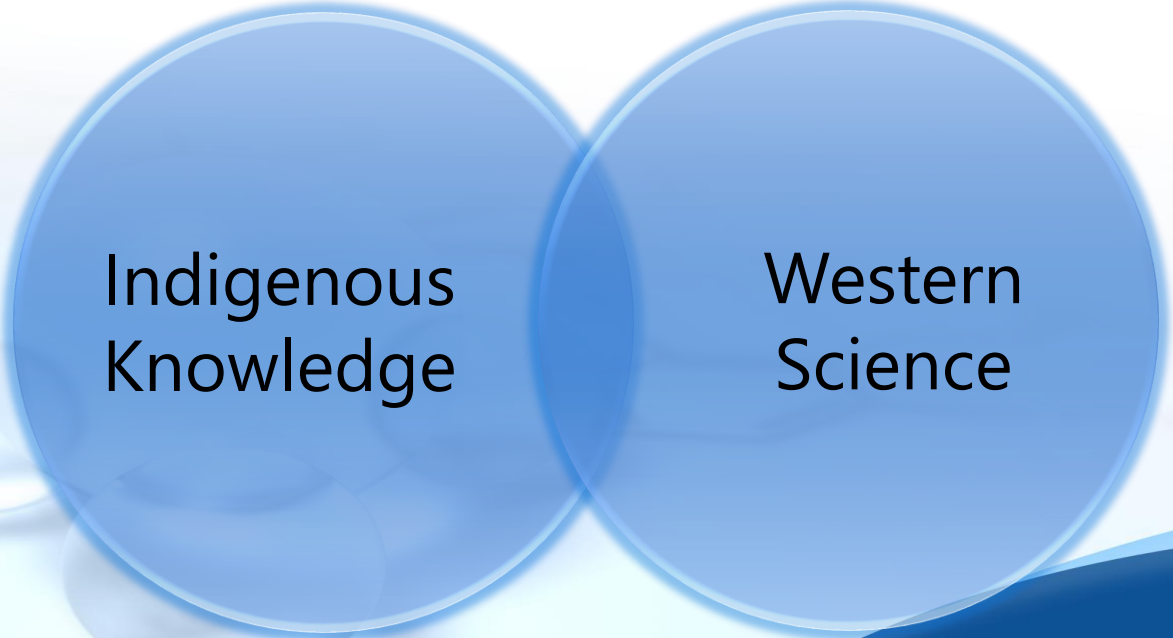


Western Science

Indigenous
Knowledge

Interweaving is equals working in tandem

Requires Western Science to be humble



Indigenous
Knowledge

A Venn diagram consisting of two overlapping blue circles. The left circle is labeled 'Indigenous Knowledge' and the right circle is labeled 'Western Science'. The circles overlap in the center, representing the intersection of the two knowledge systems. The background of the slide features a blurred image of laboratory glassware, including beakers and test tubes, with a blue wavy border at the top and bottom.

Western
Science

Blue Ecology Vision

Sustainable Survival: *survival with dignity*

Vision:

An ecological philosophy, which emerged from interweaving Indigenous and Western thought, that acknowledges water's (i.e. fresh and salt) essential rhythmical life-spirit and central functional role in generating, sustaining, receiving and ultimately unifying life on Earth Mother.

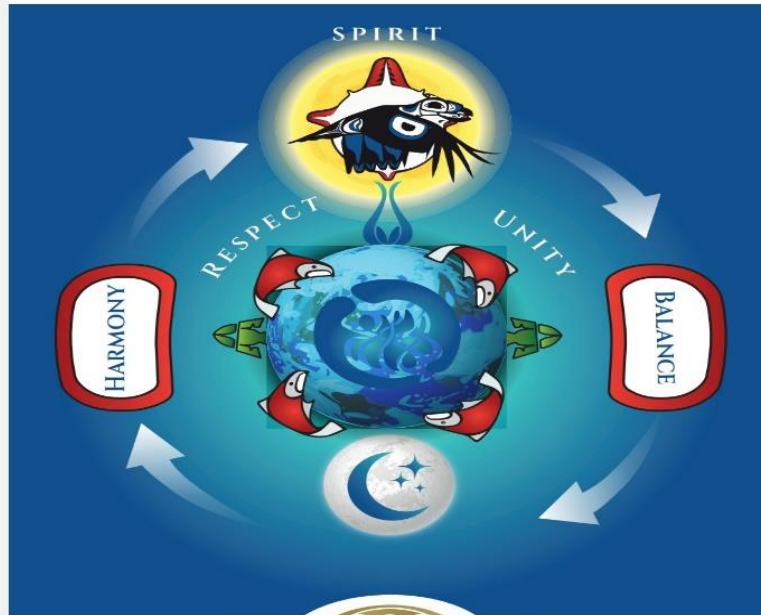
Water- First

The highest sustainability test is water-first: planned development (e.g. real estate, urban planning, forestry, agriculture, mining, oil and gas extraction) cannot impede the functional delivery of quality water to ecosystems in a healthy rhythm.

Blue Ecology is a **bridge** between two worlds

Guiding Principles: SHRUB

BLUE ECOLOGY WATER CYCLE

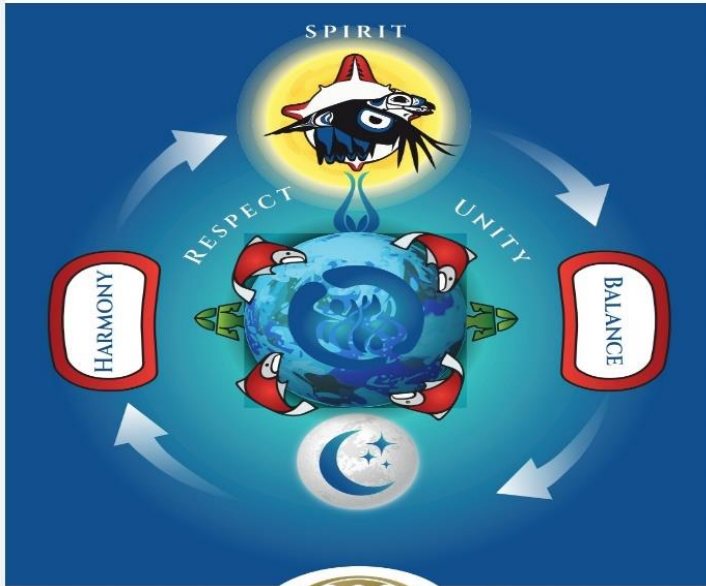


BLUE ECOLOGY
INSTITUTE

Spirit
Harmony
Respect
Unity
Balance

Guiding Principles: SHRUB

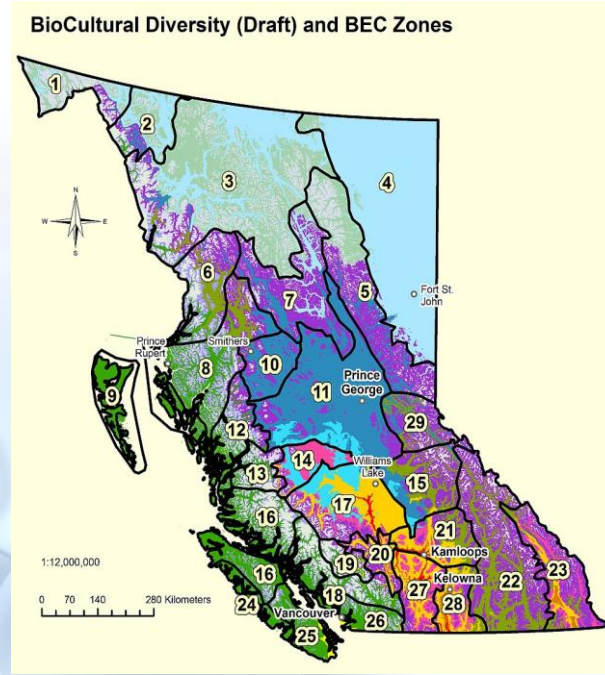
BLUE ECOLOGY WATER CYCLE



BLUE ECOLOGY
INSTITUTE

- A Collaborative Common Language at the general principle level
- Unique local biocultural diversity is addressed by creating operational principles

Biocultural Diversity Zones in BC



Source: BC Forest Professional Sept-Oct 2014

BC has highest biodiversity in Canada

BC has highest diversity of Indigenous language groups in Canada

The Pacific Coastal drainage in BC has the highest water yield per unit area in Canada
1.5m³/m²

Implementing Blue Ecology Caretaker Leadership

Gwelx ye'enst

Responsibility of a Gitxsan chief:

- Guided by Gitxsan body of law and traditions (Ayookwx)
- Obligation to continue to pass our ancestral inheritance to next generation, by protecting
 - Water and soil - the lifeblood
 - Functioning governance Wilp (house) system

Source: Chief Hanamux, pers. com.

Sparking Caretaker Leadership

Prevoyance:

- Not the power to see future
- Its the ability to prepare for the unexpected in a world of danger and uncertainty. Making sound judgments on the basis of imperfect knowledge, by taking a broad view of purpose and thinking in the long run.
- Principle based rather than prescriptive

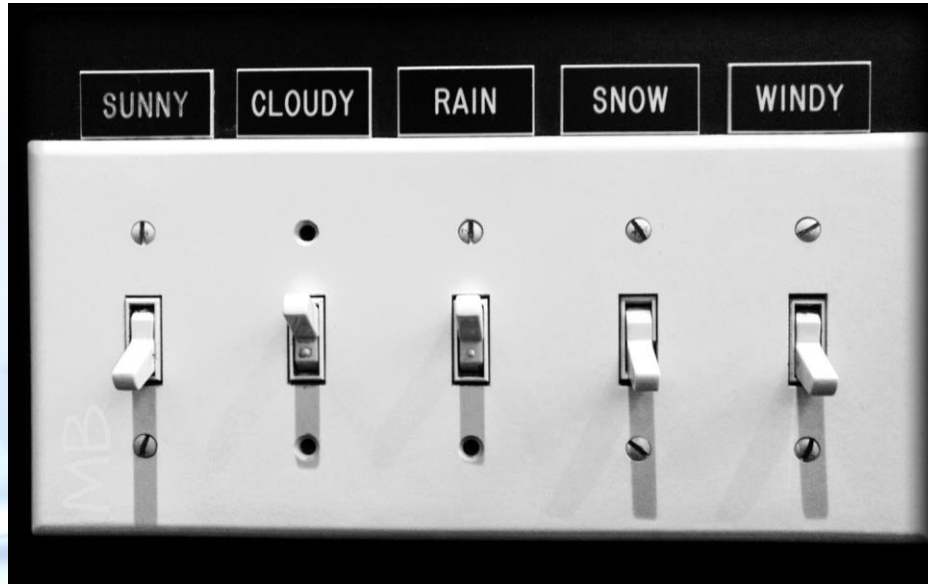
Source: Champlain's Dream (2009), David Hackett Jones, 530-31

Change Attitudes

Attitude is a collection of values, theories, philosophies, beliefs and principles that motivates and influences

It cost zero dollars to change your attitude

Switch Attitude



It costs
nothing to
change
attitude

Salmon Prince Teaching



Water Attitude

**Living entity,
biotic**



**Non-living,
abiotic**

Give Back Attitude

Give thanks for gift.
Cumulative Healing



Develop continuously
Cumulative Impacts

Elder Mary Thomas

Silver Creek Fire, Salmon Arm, 1998. Kelazen (Mount Ida) Case Study

“Let the Mountain Heal”



Source: *Journal of Ecosystems Management* Vol 6 No. 2 2005

Climate Change Attitude

Blue Ecology Lens



Carbon and Methane

Climate Change: Blue Ecology Lens

Climate change → accelerating transformation of water

The amount of moisture the atmosphere can hold increases with rising temperatures (about 7% increase per degree Celsius of warming → design infrastructure for 15% increase).

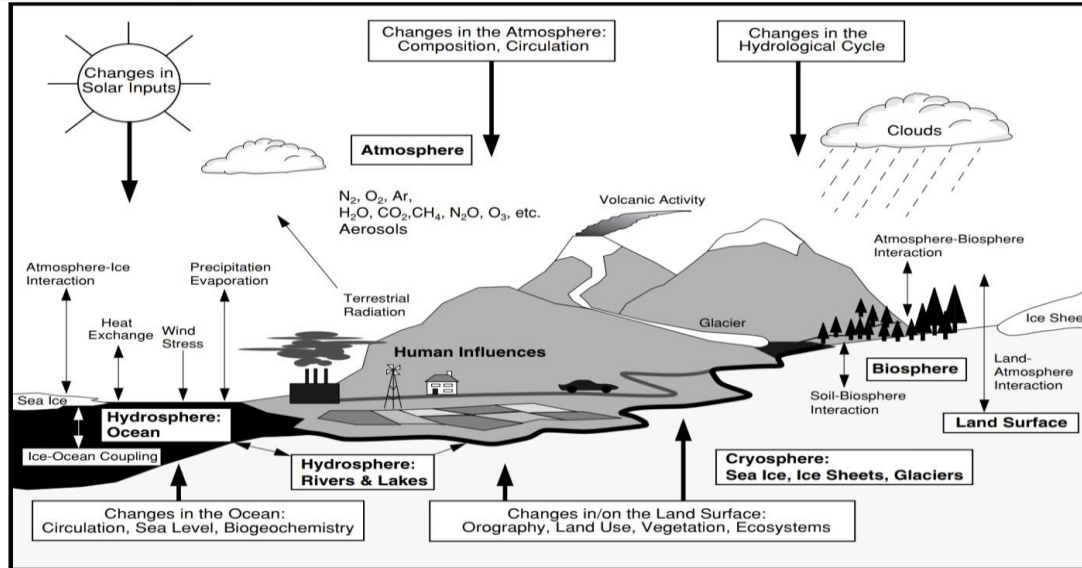


Figure 1.1: Schematic view of the components of the global climate system (bold), their processes and interactions (thin arrows) and some aspects that may change (bold arrows).

Clausius-Clapeyron equation

In Semi-arid and arid areas, however, near surface water vapour has not increased.

I.R. Simpson. PNAS. 2023

Nature Attitude oots'inhl lax yip (spirit in the land)

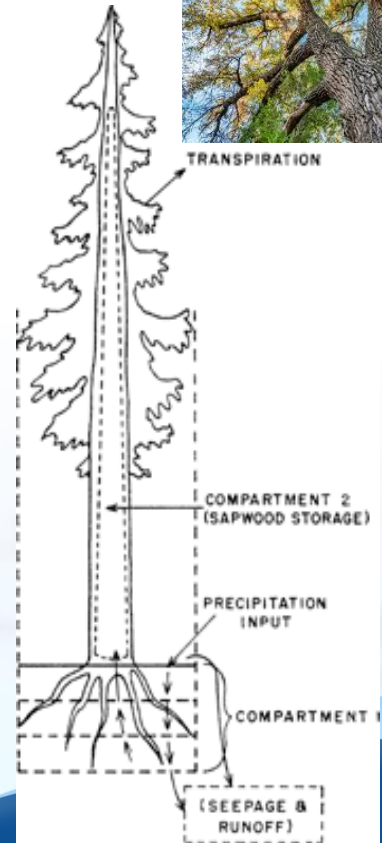
**Sense the Spirit
of Nature**



**Nature is meant to
serve human
needs**

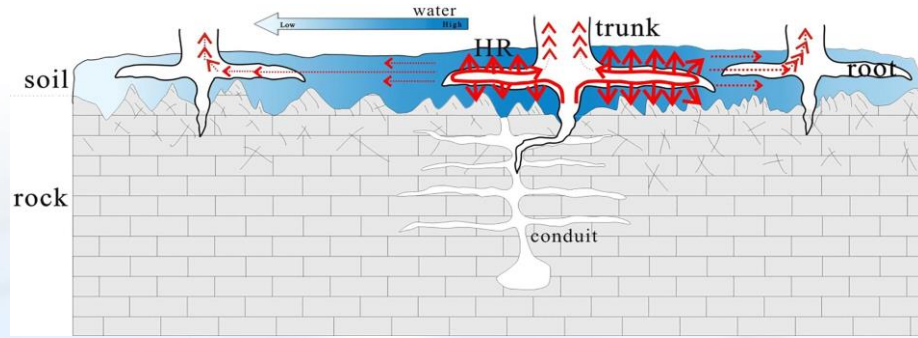
Trees act as air conditioners

- Apart from providing shade, trees cool through the process of transpiration
- Think of trees as leafy, misty fans and,
- Wind blows by columns of water.
- Trees can transpire significant volumes of water: a mature tree can transpire up to 150 litres per day.
- In a hot, dry location such as Perth, Australia this produces a cooling effect equivalent to that of two air conditioners running for 20 hours.



Source: CoastAdapt.com.au was developed by NCCARF with funding from the Australian Government through the Department of the Environment and Energy

Hydraulic Redistribution



“The water released through the sampled plant roots was not for their own use, but for that of neighboring species.”

Source: *Journal of Hydrology*, Vol 610, July 2022 Jing Ke et. al.

Natural Intelligence (NI)

Natural Intelligence is the theory and development of systems able to perform tasks that normally require the intelligence found in nature, such as the ability to adapt to changing environments, self-regulate life processes, and interact with the ecosystem in a sustainable way.

It is the inherent wisdom and adaptability exhibited by nature's ecosystems, enabling water to sustain life, maintain its purity, and flow in rhythm with the Earth's natural cycles.

Natural Intelligence (NI)

AI/NI comparison

	Cost	Energy Use	Public Comprehension
Artificial Intelligence	expensive	high electricity use	Complicated
Natural Intelligence	free	uses the sun	Easy to explain

Natural Intelligence (NI)

Ecosystem Engineers



Trees act as data recorders

Dendrochronology:

the science that deals with the dating and study of annual growth layers in wood

Fritts 1976

Main products:

- Reconstructions of past conditions; continuous time-series of environmental variables (e.g., climate, hydrology)
- Dates of environmental and human events (e.g., fires, infestations, prehistoric settlement)

-Source: Lucas and Woodhouse.





Hope is active

What can I do?

Sense the Spirit

- ❖ **Satxw**: Conscious decision of making a new day
- ❖ *Go to the water* ceremony

View climate change thru water lens

- ❖ Install **real time** hydrometric monitoring
 - ❖ SNOW, RAIN, WIND, TEMP

Go to the water and nature

- ❖ Get out of the office and meeting room
- ❖ Get out of the truck
- ❖ Invite public into the watersheds

What can I do?

Become a Blue Ecology Municipality

Give Back: We are borrowing land and water

- ❖ Donate to Blue Ecology Institute Foundation
www.blueecology.org
- ❖ Give the water & land back, in as good or better condition
- ❖ *Cumulative Healing* instead of *Cumulative Impacts*:
 - ❖ Establish **healing zones**: let Earth Mother rest!

What can I do?

Your Elevator Speech for Public

- ❖ *Changing attitude is first step, and free*
- ❖ *Water is Life*
- ❖ *Understand climate change thru a water lens*
- ❖ *Interweaving is collaboration*
- ❖ *Blue Ecology model is a collaborative common language*
- ❖ *Tailor to local level using operational principles*
 - ❖ *BC has the most biocultural diversity in Canada*
- ❖ *Natural Intelligence is free*

Blue Ecology Institute Foundation

Registered Charity in Canada



Donate www.blueecology.org



the partnership
for water sustainability in bc

Blue Ecology reference materials
<https://waterbucket.ca/wcp/category/blue-ecology-michael-blackstock/>