

Ms'it No'kmaq — "All my Relations"
... Two-Eyed Seeing exploration ...
 stories – patterns – science – theory

PART 4 (of 4) for MMBSW 3rd year students – St. Thomas University
 19 September 2013, Sackville, NB – Instructor Murray Weeks

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Science stories are pattern knowledge!

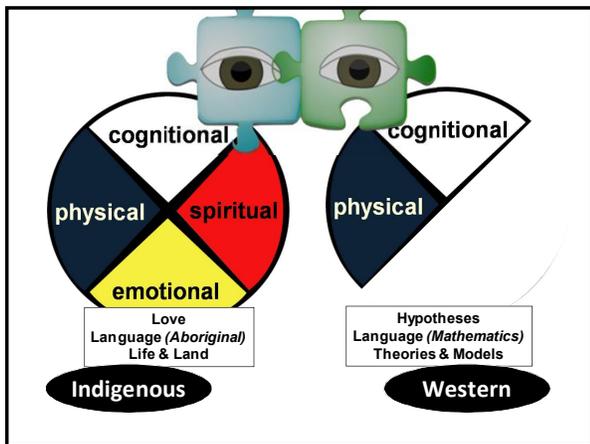
Traditionally, nothing was taught as black and white. Everything was story ... where you have the responsibility to listen and reflect. This is a much more profound way of learning because you have the opportunity for relationship with the knowledge. (words of Elder Albert Marshall)

INDIGENOUS STORIES / INDIGENOUS SCIENCE

weaving of patterns within nature's patterns via creative relationships and reciprocities among **love, land, and life (vigour)** that are constantly reinforced and nourished by **Aboriginal languages**

our science stories

Science stories are pattern knowledge!
 Co-Learning for Two-Eyed Seeing



CO-LEARNING for Two-Eyed Seeing
 learning our strengths and learning together

NATURAL WORLD (ontologies)

All my Relations	parts & wholes
beings ... interconnective and animate: spirit + energy + matter	objects ... comprised of parts and wholes characterized by systems and emergences: energy + matter
with CONSTANT CHANGE within balance and wholeness	with EVOLUTION

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

NATURAL WORLD (ontologies)

All my Relations parts & wholes

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

CONCEPTS and ACTIONS (epistemologies)

- respect
- relationship
- reverence
- reciprocity
- ritual (ceremony)
- repetition
- responsibility

- the question
- hypothesis (making & testing)
- data collection
- data analysis
- model & theory construction

J. Archibald, 2001, Can. J. Native Ed. 25(1):1-5

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

CONCEPTS and ACTIONS (epistemologies)

Artist Gerald Gloade photo credit: NRC

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

METHODOLOGIES

weaving of patterns within nature's patterns via creative relationships and reciprocities among **love, land, and life (vigour)** that are constantly reinforced and nourished by **Aboriginal languages**

un-weaving of nature's patterns (especially via analytic logic and the use of instruments) to cognitively reconstruct them, especially using **mathematical language (rigour)** and **computer models**

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

METHODOLOGIES

Life Love Land Math & instruments

vigour **rigour**

WEAVING **UN-WEAVING**

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

KNOWLEDGE OBJECTIVES

collective, living knowledge to enable nourishment of one's journey within expanding sense of place, emergence and participation+ for collective consciousness and interconnectiveness

dynamic, testable, published knowledge independent of personal experience that can enable prediction and control (and progress+)

towards resonance of understanding within environment towards construction of understanding of environment

CO-LEARNING for Two-Eyed Seeing
learning our strengths and learning together

KNOWLEDGE OBJECTIVES

from: CCL Aboriginal Learning Knowledge Centre (www.ccl.ca.ca/CCL) from: www.leeds.ac.uk

towards resonance of understanding within environment

towards construction of understanding of environment

our science stories

Science stories are pattern knowledge!
We humans have "pattern smarts"!
Using different smarts results in telling different stories.

patterns

"thing" difference pattern

human consciousness variation and diversity

Connect the "things" (dots)
... see patterns ... make stories.
Various ways to connect the dots
result in diversity in our stories.

Connect the "things" (dots)
... see patterns ... make stories.
Various ways to connect the dots
result in diversity in our stories.

told as stories about our interactions with and within nature ...

patterns

Science is dynamic pattern-based knowledge.

Integrative Science

told as stories about our interactions with and within nature ...

patterns

human pattern smarts

- various ways to connect the dots
- diversity in our stories

- ◊ numbers (logical-mathematical)
- ◊ language (linguistic)
- ◊ music (musical)
- ◊ body (body-kinesthetic)
- ◊ spatial (spatial)
- ◊ other people (interpersonal)
- ◊ self (intrapersonal)
- ◊ naturalist (naturalist)
- ◊ spiritual / existential*

Howard Gardner's "multiple intelligences"

human pattern smarts

- various ways to connect the dots
- diversity in our stories



- ◊ numbers (logical-mathematical)
- ◊ language (linguistic)
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Howard Gardner's "multiple intelligences"

human pattern smarts

- various ways to connect the dots
- diversity in our stories




our science stories ... draw upon our "pattern smarts"

- word smarts
- math smarts
- music smarts
- nature smarts
- picture smarts
- body smarts
- spirit smarts
- people smarts
- self smarts

WHAT STORIES ... depends upon: SANCTIONED PERSPECTIVES & INTELLIGENCES
 who we are; where we are; where we were;
 what we know, do and value



science stories that ... acknowledge few "pattern smarts"

Howard Gardner's "multiple intelligences theory"

- word smarts
- math smarts
- nature smarts

SANCTIONED "SMARTS":
 who we are; where we are; where we were;
 what we know, do and value

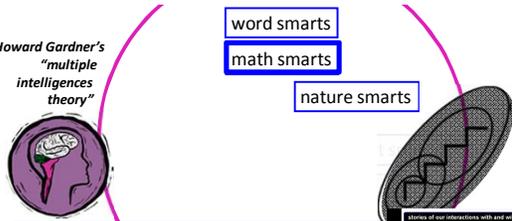
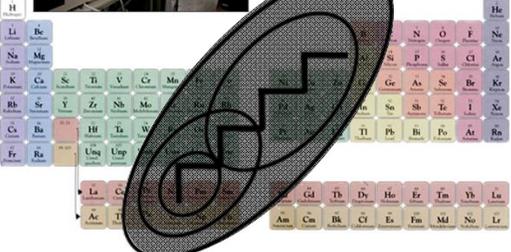




photo credit: NRC

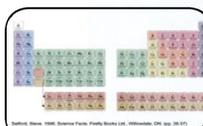
Western Science

Universe: Visible Matter (levels of organization - biology)

- Universe
- super clusters (Local)
- clusters (Local Group)
- galaxies (Milky Way)
- star systems (Sun)
- planet Earth
- ecosystems
- communities
- populations
- organisms
- organ systems
- organs
- tissues
- cells
- organelles
- molecules & minerals
- atoms (natural elements #1-92; artificial elements #93 & higher)
- baryons (neutrons & protons)
- fundamental particles (quarks & leptons)

Western Science



Universe: Visible Matter (levels of organization - biology)

Western Science

SCIENCE stories of: parts & wholes

my world is many "its" (objects)

Universe: Visible Matter (levels of organization - biology)

language: mathematics

Western Science

science stories that ... draw upon many "pattern smarts"

Howard Gardner's "multiple intelligences theory"

Science

SAISONED "SMARTS": who we are; where we are; where we were; what we know, do and value

stories of: interconnectiveness

Indigenous Science

my world is "all my relations" (subjects)

Ms+it No'kmaq — "All my Relations"

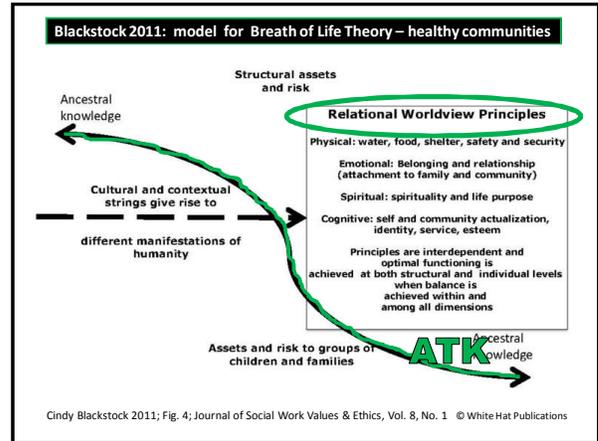
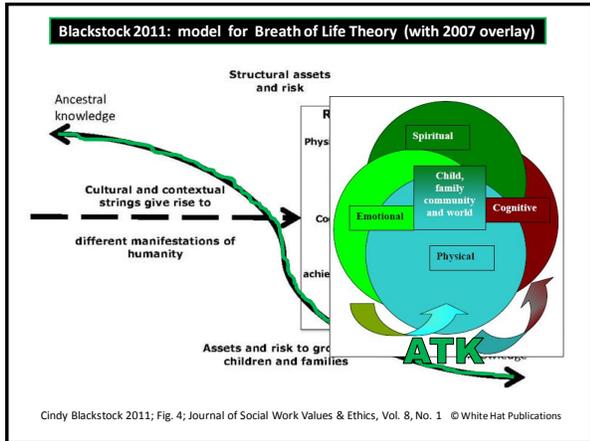
stories of: interconnectiveness

Indigenous Science

four aspects of being human

Blackstock model for Breath of Life Theory 2007

from: C. Blackstock 2007; The breath of life versus the embodiment of life: Indigenous knowledge and western research, Fig. 1; WIN-HEC Journal (World Indigenous Nations – Higher Education Consortium)



Indigenous **Western**

The challenge is to bring together the strengths from both so as not to compromise the integrity of Mother Earth.
words of Elder Albert Marshall

[Western] Science is distinguished from other pursuits by the precise and limited intellectual means that it employs and the integrity with which it uses its limited means.

The scientific pursuit of truth uses no end of tools, ranging from sensitive scales to register the weight of a hair to observatories of the heavens.

Jane Jacobs, p. 65, 2004. Dark Age Ahead. Vintage Canada

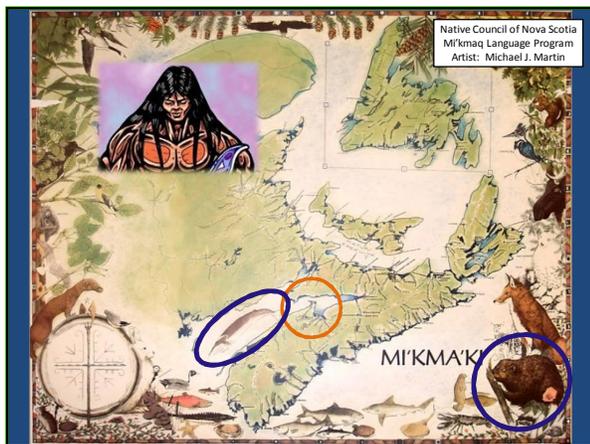
Cindy Blackstock 2011; Fig. 4 - Breath of Life Theory; Journal of Social Work Values & Ethics, Vol. 8, No. 1. © White Hat Publications

another science story - understood with Two-Eyed Seeing -

Catastrophic tidal expansion in the Bay of Fundy, Canada

by: John Shaw, Carl L. Amos, David A. Greenberg, Charles T. O'Reilly, D. Russell Parrott, and Eric Patton

2010 ARTICLE in: Canadian Journal of Earth Sciences 47(8): 1079-1091





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MI'KMA'KI

Kluscap, wanting to take a bath, ordered Beaver to build a dam across the mouth of the bay to hold the ocean water so that there would be lots of water for his bath.



MI'KMA'KI

Beaver did as Kluscap asked. But Whale was unhappy because now the water did not flow as before. "Why has the water stopped?" Whale cried.

with permission of Artist Gerald Gloade, Millbrook First Nation



MI'KMA'KI

Kluscap hearing him and not wanting Whale to be upset told Beaver to break the dam and release the water. Beaver liked the dam he had made, so he was slow to begin taking it apart.

with permission of Artist Gerald Gloade, Millbrook First Nation



MI'KMA'KI

Whale became impatient. He wanted the water as it was before. Using his great tail, he started breaking the dam apart.

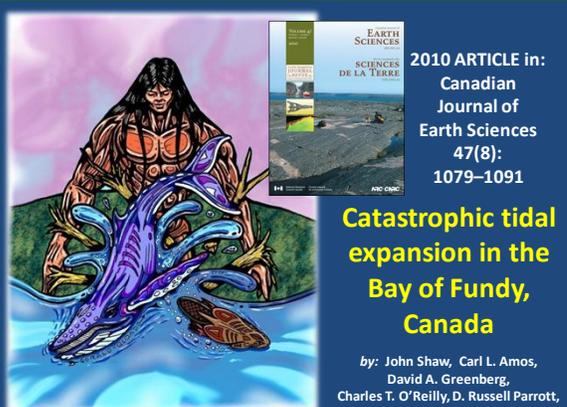
with permission of Artist Gerald Gloade, Millbrook First Nation



MI'KMA'KI

The dam broke. And it caused water to flow back and forth with such force that it continues so until this day.

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MI'KMA'KI

2010 ARTICLE in:
Canadian Journal of Earth Sciences 47(8): 1079–1091

Catastrophic tidal expansion in the Bay of Fundy, Canada

by: John Shaw, Carl L. Amos, David A. Greenberg, Charles T. O'Reilly, D. Russell Parrott, and Eric Patton

with permission of Artist Gerald Gloade, Millbrook First Nation



We argue that the catastrophic breakdown of the barrier is related in the legend, showing that Aboriginal peoples observed the rapid environmental changes and preserved an oral record for 3400 years.

last sentence in ABSTRACT for: Shaw et al. 2010

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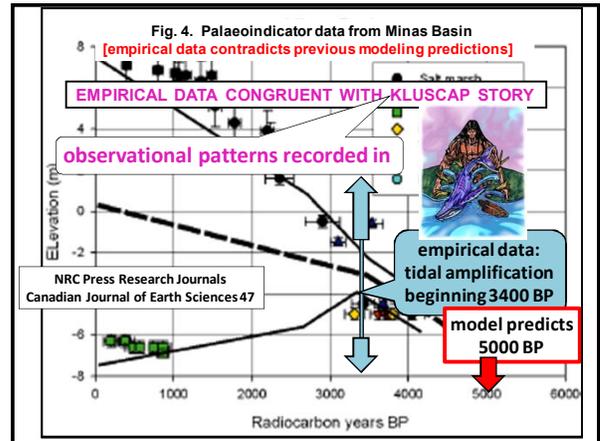
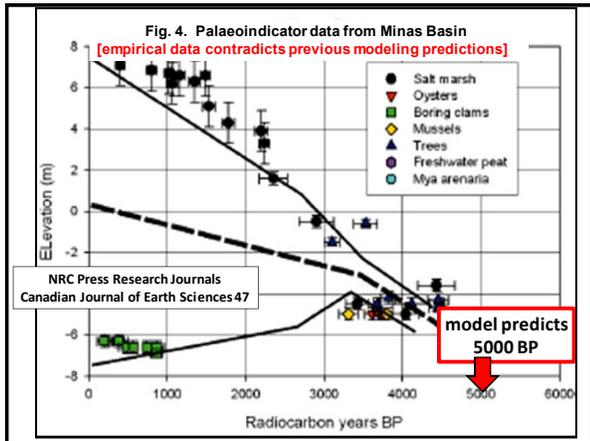
We argue that the catastrophic breakdown of the barrier is related in the legend, showing that Aboriginal peoples observed the rapid environmental changes and preserved an oral record for 3400 years.

last sentence in ABSTRACT for: Shaw et al. 2010

Table 1: Radiocarbon dates

Location	Year AD	Lab No.	Material	Reference
Esquimalt	1978-1979	135-2011	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2010	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2012	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2013	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2014	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2015	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2016	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2017	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2018	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2019	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2020	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2021	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2022	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2023	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2024	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2025	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2026	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2027	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2028	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2029	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2030	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2031	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2032	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2033	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2034	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2035	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2036	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2037	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2038	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2039	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2040	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2041	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2042	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2043	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2044	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2045	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2046	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2047	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2048	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2049	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2050	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2051	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2052	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2053	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2054	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2055	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2056	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2057	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2058	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2059	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2060	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2061	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2062	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2063	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2064	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2065	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2066	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2067	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2068	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2069	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2070	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2071	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2072	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2073	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2074	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2075	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2076	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2077	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2078	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2079	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2080	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2081	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2082	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2083	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2084	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2085	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2086	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2087	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2088	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2089	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2090	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2091	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2092	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2093	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2094	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2095	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2096	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2097	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2098	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2099	SMF	Soek and Coombes 1983
Esquimalt	1978-1979	135-2100	SMF	Soek and Coombes 1983

NRC Press Research Journals
Canadian Journal of Earth Sciences 47



Elders
and
Aboriginal Traditional Knowledge (ATK)
and
communities, organizations, and institutions




As Elders, we realize
KNOWLEDGE IS SPIRIT.
It is a Gift passed on through many people. We must pass it on.

words of
Elder Albert Marshall




Artist Gerald Gloade, Millbrook First Nation

We Elders need to share our understandings of Traditional Knowledge to be healthy.

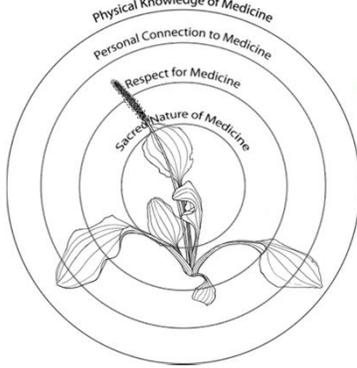


In sharing, I am trying to live up to the responsibility of why I was given that knowledge.

words of Elder Albert Marshall

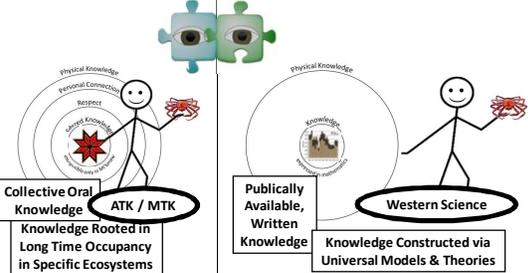
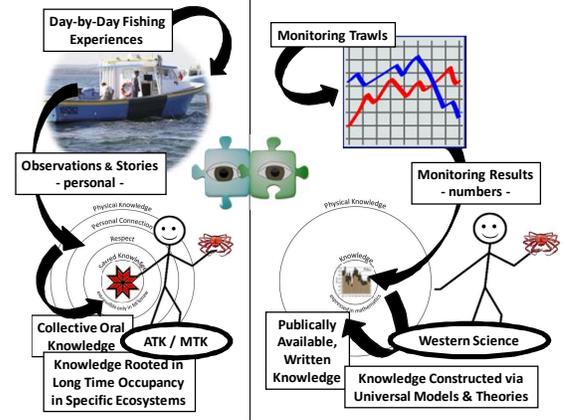


Mi'kmaw Traditional Knowledge
(concentric circles model)

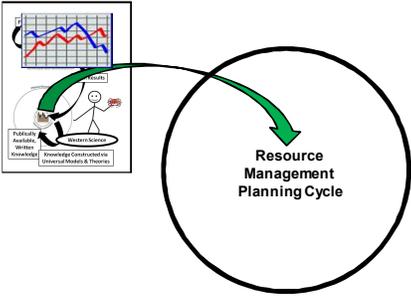



Teachings of Mi'kmaw Elder Murdena Marshall
Eskasoni First Nation

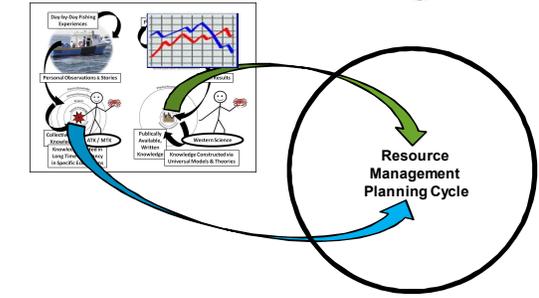
adopting and adapting Elder Murdena's ATK model ...

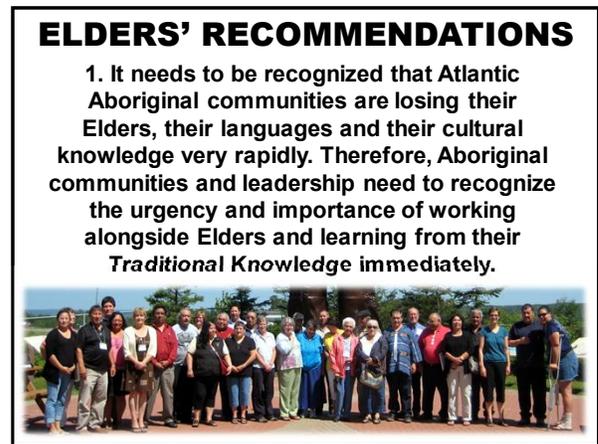
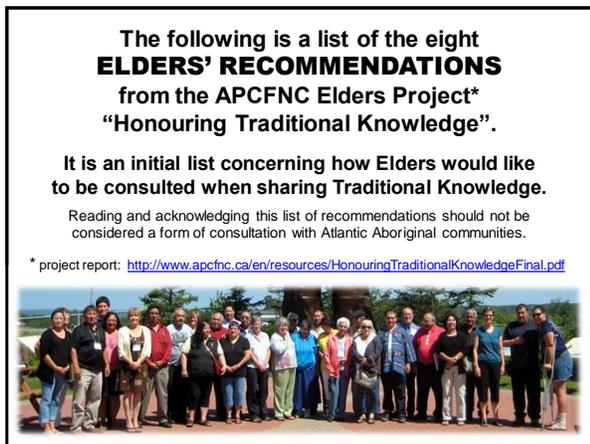
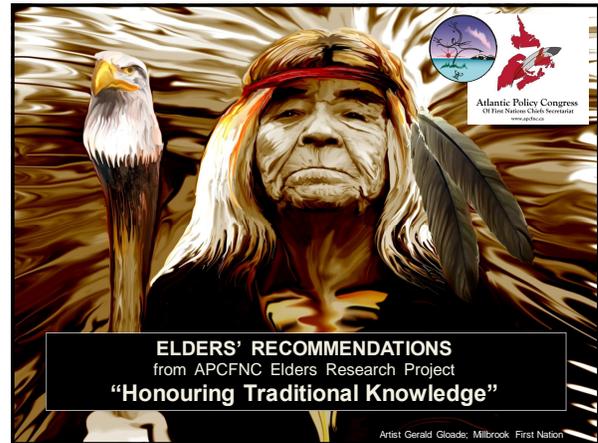
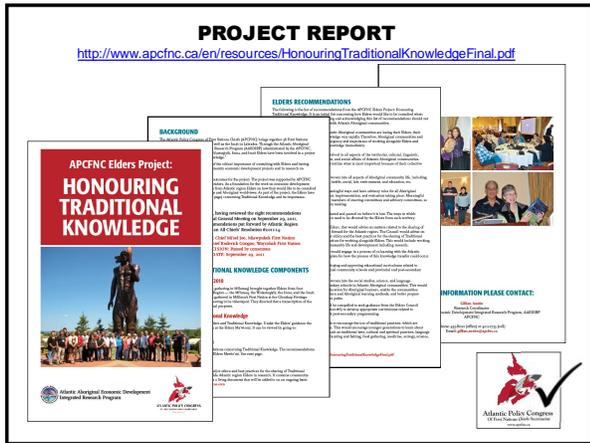
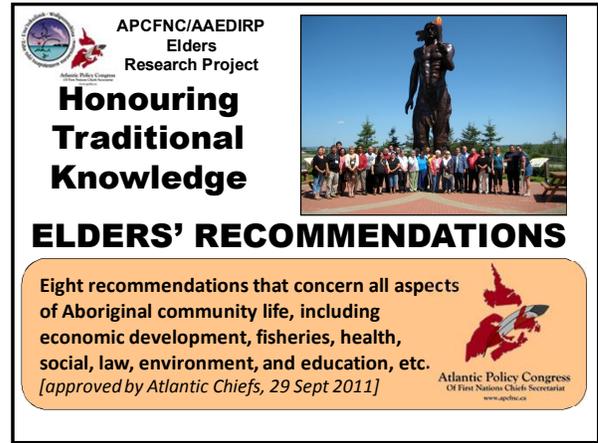
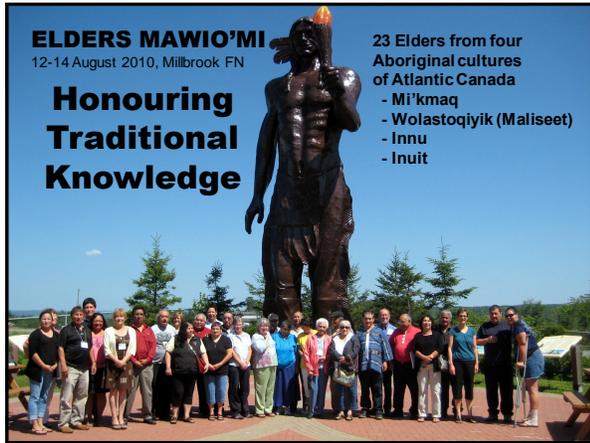



moving from this approach:

to this approach:



ELDERS' RECOMMENDATIONS

2. It is imperative that Elders be involved in all aspects of the territorial, cultural, linguistic, ecological, economic development and social affairs of Atlantic Aboriginal communities. Elders are in a position to help prioritize what is most important because of their collective cultural knowledge.



ELDERS' RECOMMENDATIONS

3. Traditional Knowledge should be woven into all aspects of Aboriginal community life, including economic development, fisheries, health, social, law, environment and education, etc.



ELDERS' RECOMMENDATIONS

4. Elders should be consulted in meaningful ways and have advisory roles for all Aboriginal community planning, development, implementation and evaluation taking place. Meaningful involvement would include being members of steering committees and advisory committees so that Elders have input into decision making.



ELDERS' RECOMMENDATIONS

5. Traditional Knowledge must be shared and passed on before it is lost. The ways in which Traditional Knowledge is passed on, needs to be directed by the Elders from each territory.



ELDERS' RECOMMENDATIONS

6. An Elders Council, appointed by Elders, that would advise on matters related to the sharing of Traditional Knowledge, should be formed for the Atlantic region. The Council would advise on matters related to protocols and/or ethics and the best practices for the sharing of Traditional Knowledge as well as the best practices for working alongside Elders. This would include working alongside Elders in all areas of community life and development including research.



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The Elders Council, once formed, would engage in a process of co-learning with the Atlantic region universities to create a template for how the process of this knowledge transfer could occur.

ELDERS' RECOMMENDATIONS

7. Elders should be involved in developing and approving educational curriculum related to Traditional Knowledge for Aboriginal community schools, provincial and post-secondary institutions in the Atlantic region.

Traditional Knowledge should be woven into the social studies, science and language curriculum for primary and secondary schools in Atlantic Aboriginal communities. This would ensure proper and meaningful education for Aboriginal learners, enable the communities to develop a balance between western and Aboriginal learning methods and better prepare Aboriginal children for their future paths.



Post-secondary institutions should be compelled to seek guidance from the Elders Council (described above in # 6) to develop appropriate curriculum related to Traditional Knowledge for relevant post-secondary programming.

ELDERS' RECOMMENDATIONS

8. Each Aboriginal community needs to encourage the use of traditional practices, which are products of Traditional Knowledge. This would encourage younger generations to learn about and respect traditional practices, such as traditional laws, cultural and spiritual practices, language learning and practices related to hunting and fishing, food gathering, medicine, ecology, science, arts and education.



Elders
Wisdom
Thinking
Understanding
Analyzing
Integration

Light
Beginnings
Renewal
Hope
Courage

Darkness
The unknown
Perseverance
Reflection
Respect for
others' beliefs

Generosity
Determination
Goal setting
Ability to set aside
strong feelings in
order to serve others

Artist Gerald Glozier, Millbrook First Nation text from: 'The Sacred Tree' 1984, Bopp et al.

our THANKS to many Elders & many others



Mi'kmaw Elders & Educators & Students

our THANKS to CBU's Integrative Science Team



Research Team & Artists

Thank you Wela'liq

The assistance of many individuals is gratefully acknowledged.

Canada Research Chairs
Social Sciences and Humanities Research Council of Canada

Chaires de recherche du Canada
Conseil de recherches en sciences humaines du Canada

Thank you Wela'liq

The support of various partners and funding agencies is gratefully acknowledged.

for additional information see:
www.integrativescience.ca



Artist Basma Kavanagh