

ENVIRONMENT CANADA: 1 December 2011 – Dartmouth, NS

Marshall

PART 1

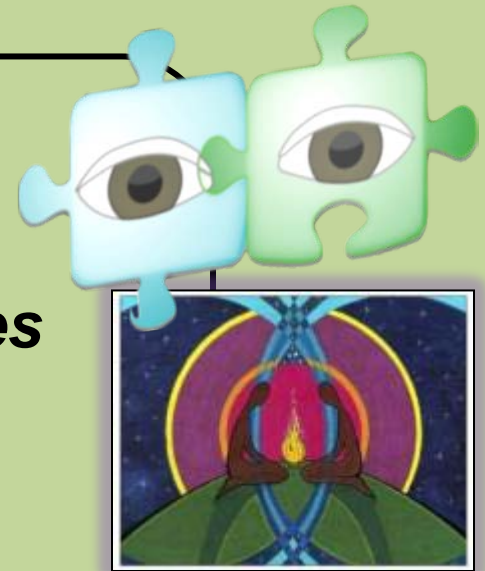
TWO-EYED SEEING

*an old-new way of
bringing together different perspectives
&*

PART 2

INTEGRATIVE SCIENCE

Bartlett



Albert Marshall¹ and Cheryl Bartlett²

¹ Elder and HonDLitt, Eskasoni community, Mi'kmaw Nation

² Canada Research Chair in Integrative Science & Professor of Biology



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**Island of
Cape Breton - Unama'ki**

Cape Breton University

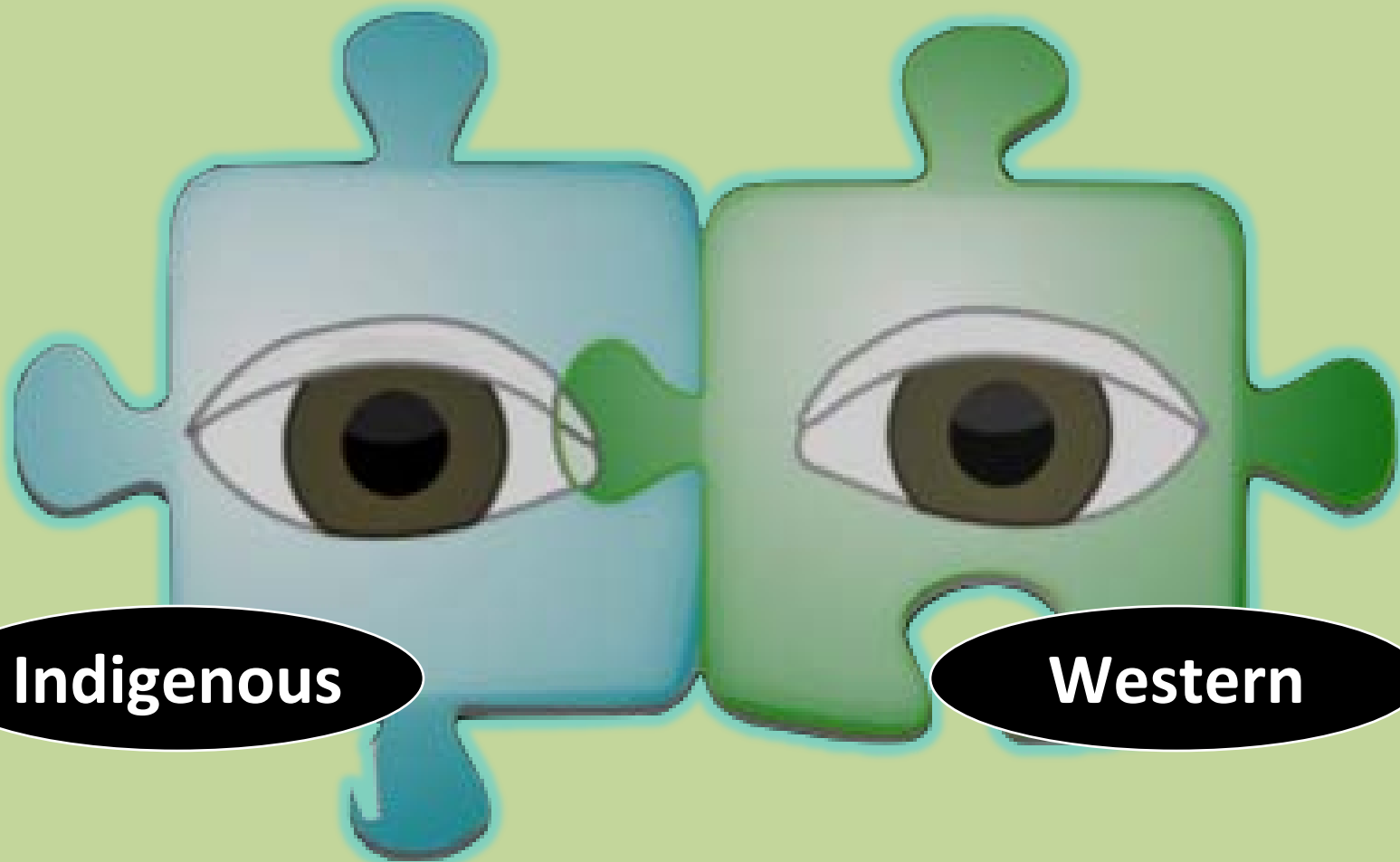
Eskasoni First Nation

Halifax

MI'KMA'KI



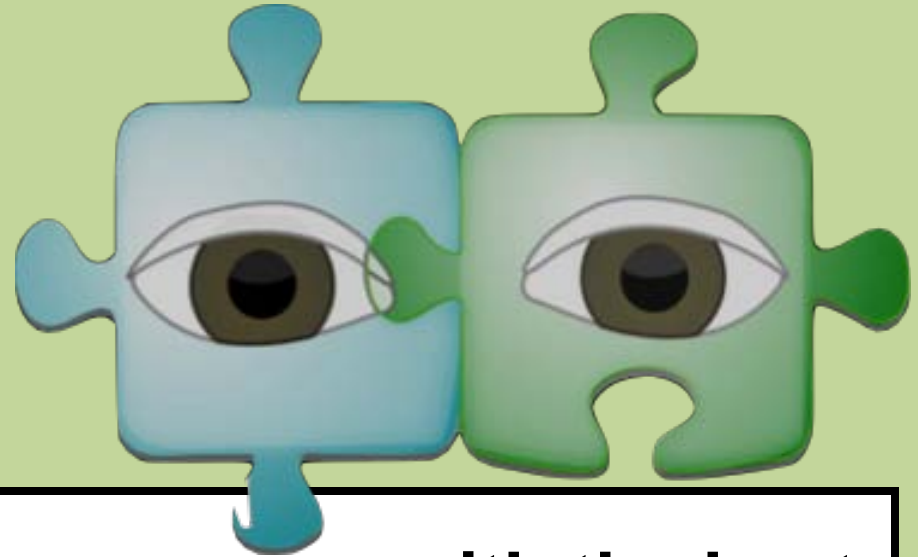
Etuaptmumk – Two-Eyed Seeing



Indigenous

Western

Two-Eyed Seeing



LEARN ... to see from one eye with the best in the Indigenous ways of knowing, and from the other eye with the best in the Western (or mainstream) ways of knowing

... and LEARN to use both these eyes together for the benefit of all.

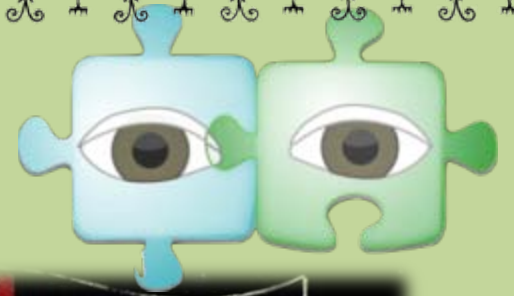
As Elders in Our Time

We seek to be a conduit for wisdom of our Ancestors.

We seek to see with "TWO EYES" ... to take the accomplishments of the white man's ways further by blending it with the wisdom of our Ancestors.

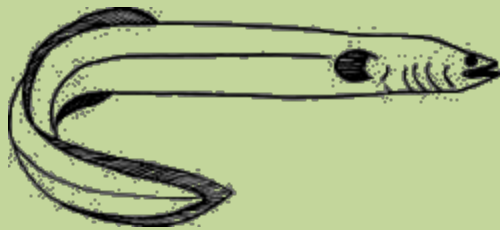
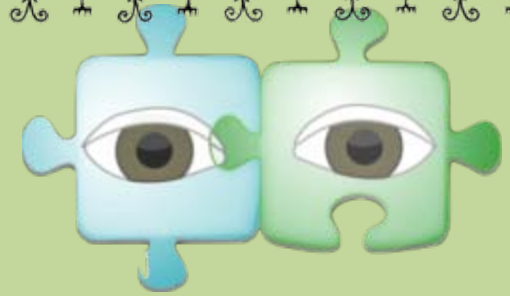


**Everything that we
do to our natural world
... we also
do to ourselves.**



Artist Basma Kavanagh

If species become extinct,
some of our relations are
gone forever ...

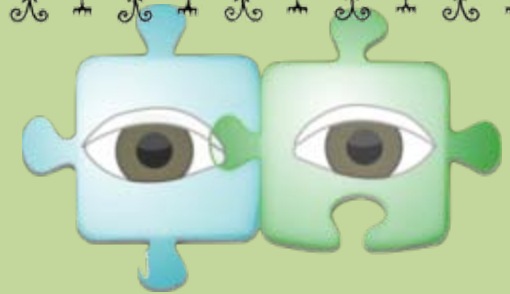


Eels (Kataq)
are now a
*Species
of Concern.*



Artist Basma Kavanagh

**Our language teaches us
that everything alive is
both physical and spiritual.**



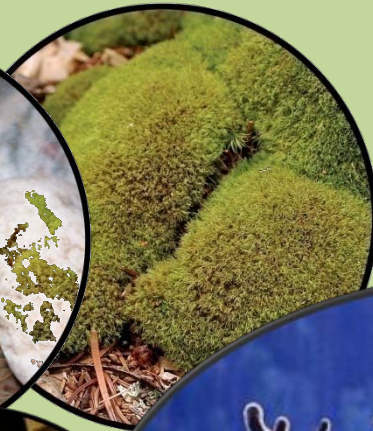
**The onus is on the person
to look at our natural
world with two
perspectives.**

**Modern science sees
objects, but our language
teaches us to see subjects.**



**We have to
dissociate
ourselves from the
“*Myth of False Security*”
that the industrial
revolution has
instilled in our minds.**





Humans possess responsibilities.

Other species possess rights.



Consciousness of Knowing



artist Basma Kavanagh

Co-existence
Interrelativeness
Interconnectiveness
Community Spirit
... with each other and
with Mother Earth

All people must learn
Two-Eyed Seeing
so that knowledge of the
physical is not separated
from wisdom of the spiritual.

considerations: planning – policy – participation

INTERCONNECTIVENESS
with each other and
the natural world
... our nurturing web



considerations: planning – policy – participation

INTERCONNECTIVENESS



(words of Elder Albert Marshall)

“If only we would spend a few moments to determine if there are possibilities for change ... to hear the **STORIES from cultures other than our own.”**



“Let us find ways to share our stories.”

Wela'lioq / Thank you

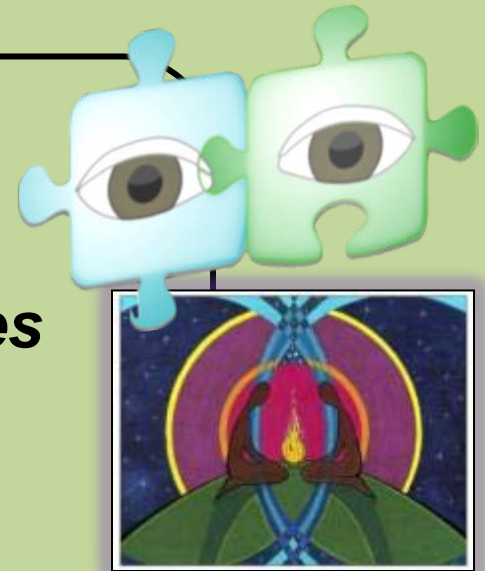


with permission of Tuma Young, photographer

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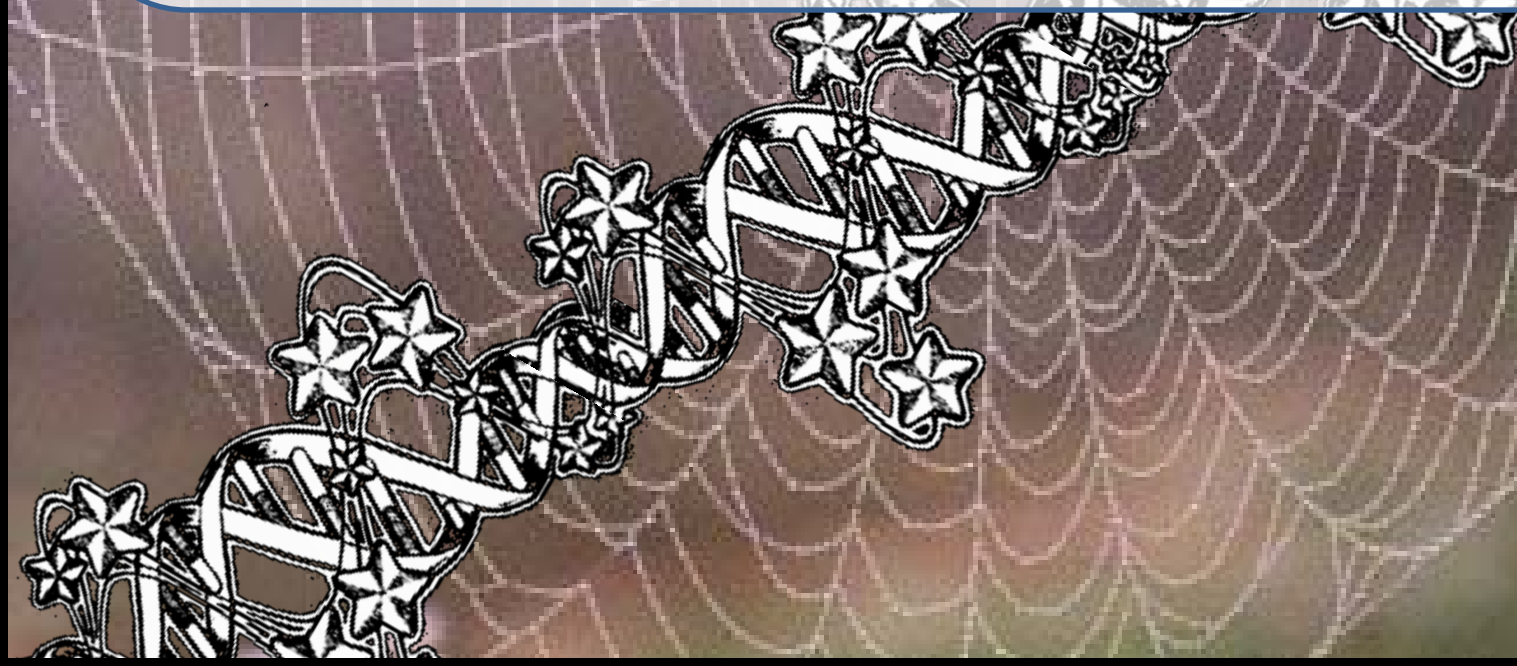
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considerations: planning – policy – participation

INTERCONNECTIVENESS
with each other and
the natural world
... our nurturing web



considerations: planning – policy – participation

INTERCONNECTIVENESS



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Integrative Science

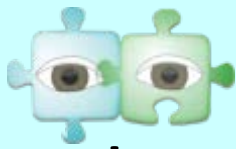


Indigenous

our stories
our sciences
our worldviews

Western

“bringing our knowledges together”



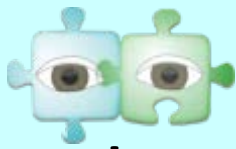
TWO-EYED SEEING

learning to see with the strengths of each & together

OUR KEY CONCEPTS and ACTIONS

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

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



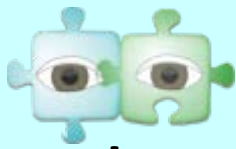
TWO-EYED SEEING

learning to see with the strengths of each & together

OUR LANGUAGES and 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



TWO-EYED SEEING

learning to see with the strengths of each & together

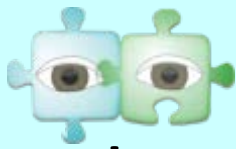
OUR OVERALL KNOWLEDGE OBJECTIVES

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

**towards resonance of
understanding within environment**

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

**towards construction of
understanding of environment**



TWO-EYED SEEING

learning to see with the strengths of each & together

OUR WORLD

interconnective

beings ...

interconnective and

animate: *spirit +*

energy + matter

with

CONSTANT CHANGE

within balance and wholeness

parts & wholes

objects ...

comprised of parts and

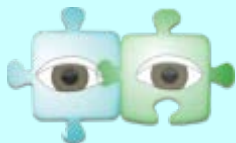
wholes characterized by

systems and emergences:

energy + matter

with

EVOLUTION

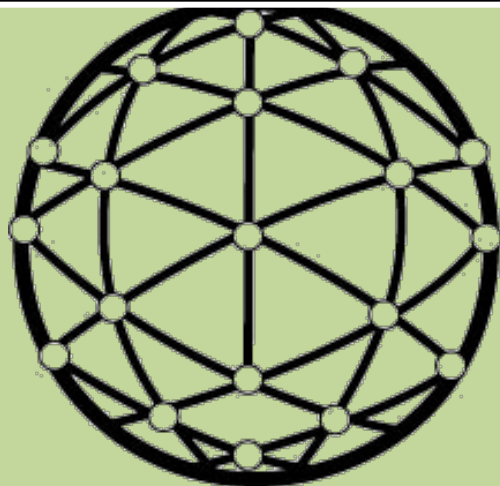


TWO-EYED SEEING

learning to see with the strengths of each & together

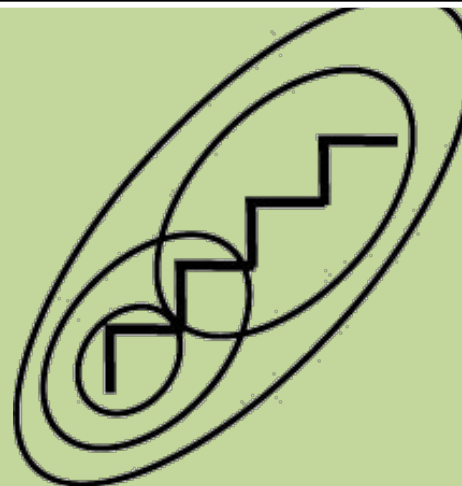
OUR WORLD

interconnective



CONSTANT CHANGE
within balance and wholeness

parts & wholes



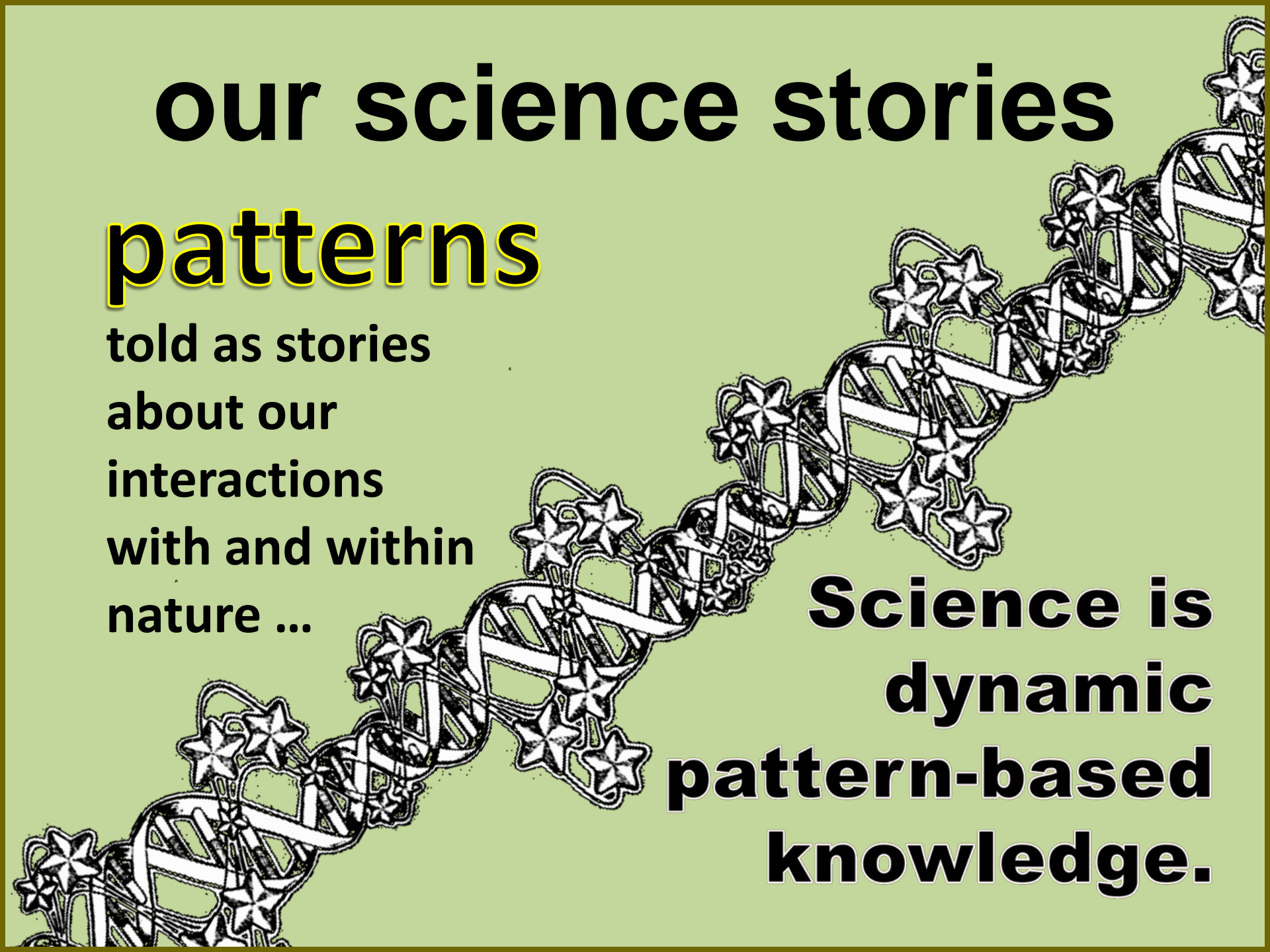
EVOLUTION
with systems and emergences

our science stories

patterns

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

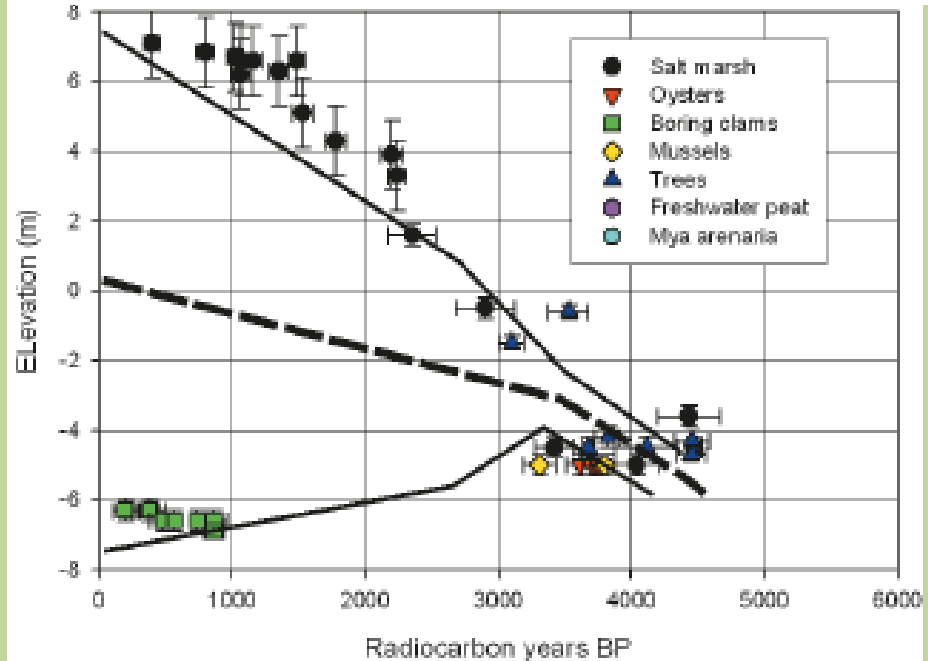
**Science is
dynamic
pattern-based
knowledge.**



our science stories



Fig. 4. Palaeoindicator data from Minas Basin.



NRC Press Research Journals
Shaw et al. 2010; CJES 47: 1086

towards resonance of
understanding within environment

towards construction of
understanding of environment



with permission of Artist Gerald Gloade, Millbrook First Nation



beginning of story

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 ...



with permission of Artist Gerald Gloade, Millbrook First Nation



end of story

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



with permission of Artist Gerald Gloade, Millbrook First Nation



**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**

NRC Press Research Journals

Canadian Journal of Earth Sciences 47

Table 1: Radiocarbon dates

Location	Age (radiocarbon years BP)	Lab No.	Material	Elevation (metres geodetic datum)	References
Kingsport	2905±220	GX-6811	SMP	-0.5000	Scott and Greenberg 1983
Kingsport	4430±235	GX-6810	SMP	-3.6000	Scott and Greenberg 1983
Beausejour	1335±130	GX-8141	SMP	3.6000	Scott and Greenberg 1983
Beausejour	2185±145	GX-8142	SMP	1.5000	Scott and Greenberg 1983
Beausejour	2620±145	GX-8143	SMP	-0.3000	Scott and Greenberg 1983
Beausejour	3800±160	GX-8145	SMP	-5.6000	Scott and Greenberg 1983
Mary's Point	2225±160	GX-8146	SMP	2.5000	Scott and Greenberg 1983
Mary's Point	3130±180	GX-8147	SMP	0.7000	Scott and Greenberg 1983
Mary's Point	3240±160	GX-8148	SMP	-0.2000	Scott and Greenberg 1983
Mary's Point	3640±180	GX-8145	SMP	-4.0000	Scott and Greenberg 1983
Aulac	2500±60	Beta-65696	SMP	1.7000	This paper
Aulac	2100±60	Beta-65695	SMP	1.8300	This paper
Aulac	1240±60	Beta-74550	SMP	4.3500	This paper
Aulac	2230±60	Beta-74551	SMP	2.5000	This paper



We argue that the catastrophic breakdown of the barrier is related in the legend,

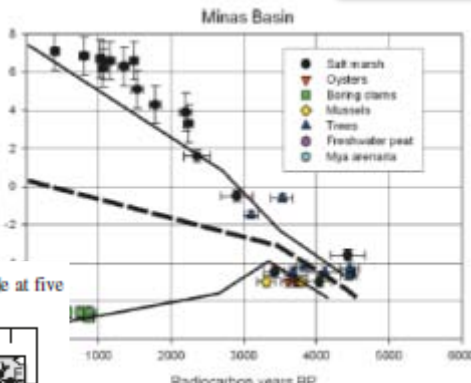
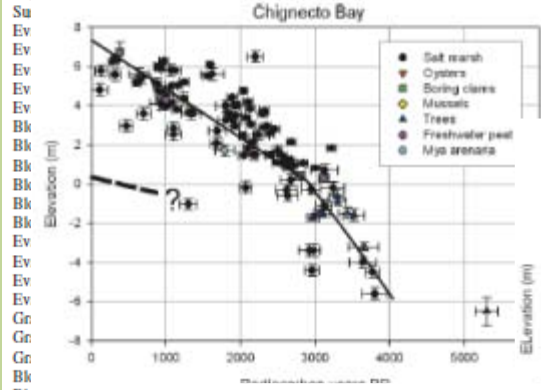
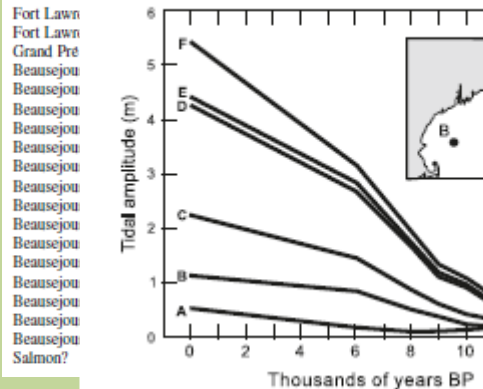
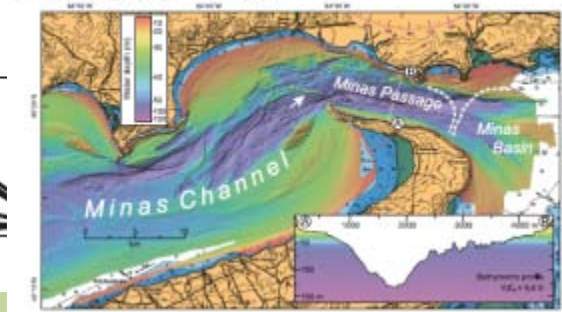


Fig. 5. Modeling results showing changes in tidal amplitude at five locations in the study area.

Fig. 6. Top: Topography of Minas Passage based on multibeam bathymetry; bottom: interpretation. White arrow on top image indicates position of a bedrock ridge extending southeast from Cape Sable.



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*

Fig. 4. Palaeoindicator data from Minas Basin

8 - [empirical data contradicts previous modeling predictions]

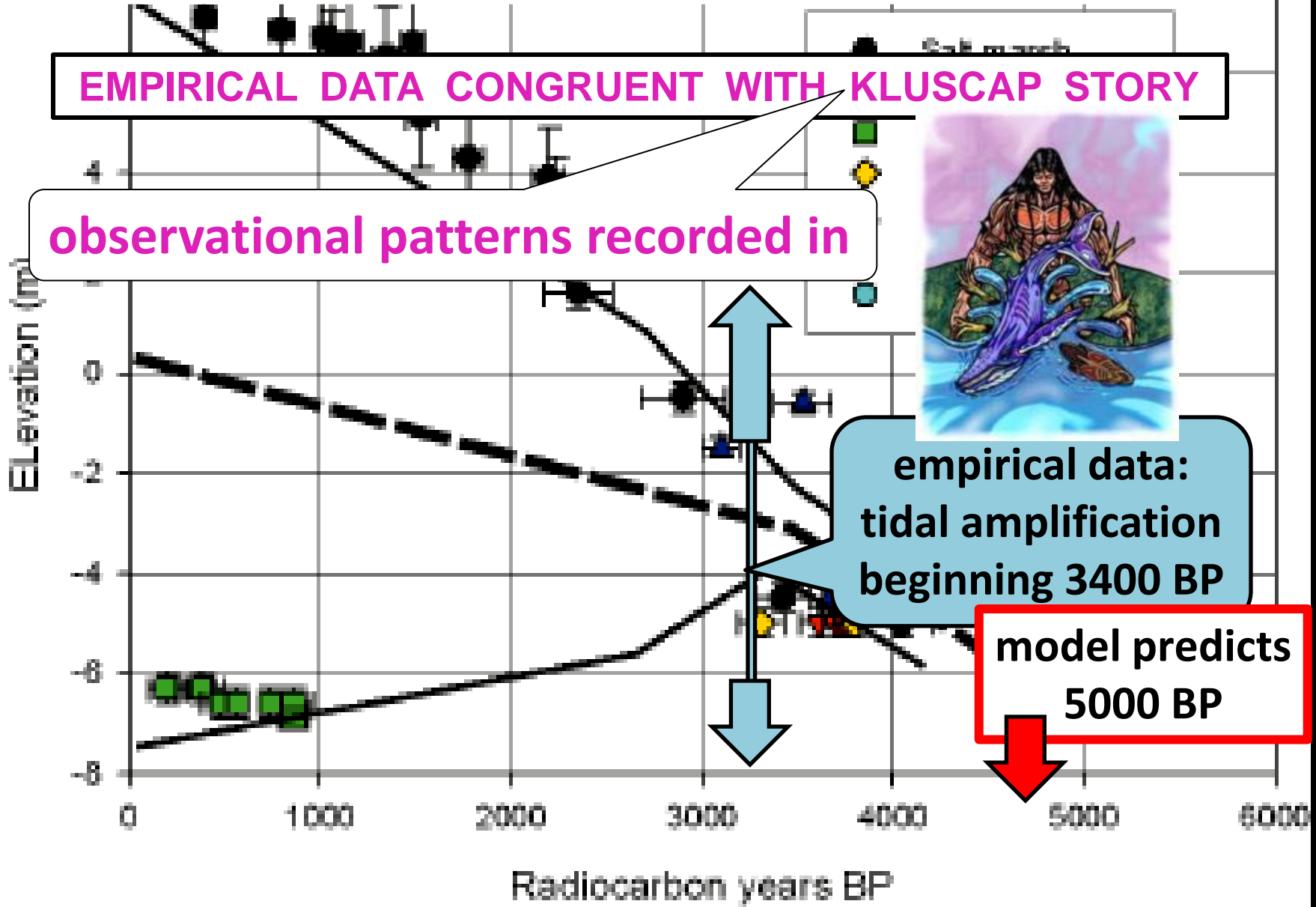
EMPIRICAL DATA CONGRUENT WITH KLUSCAP STORY

observational patterns recorded in



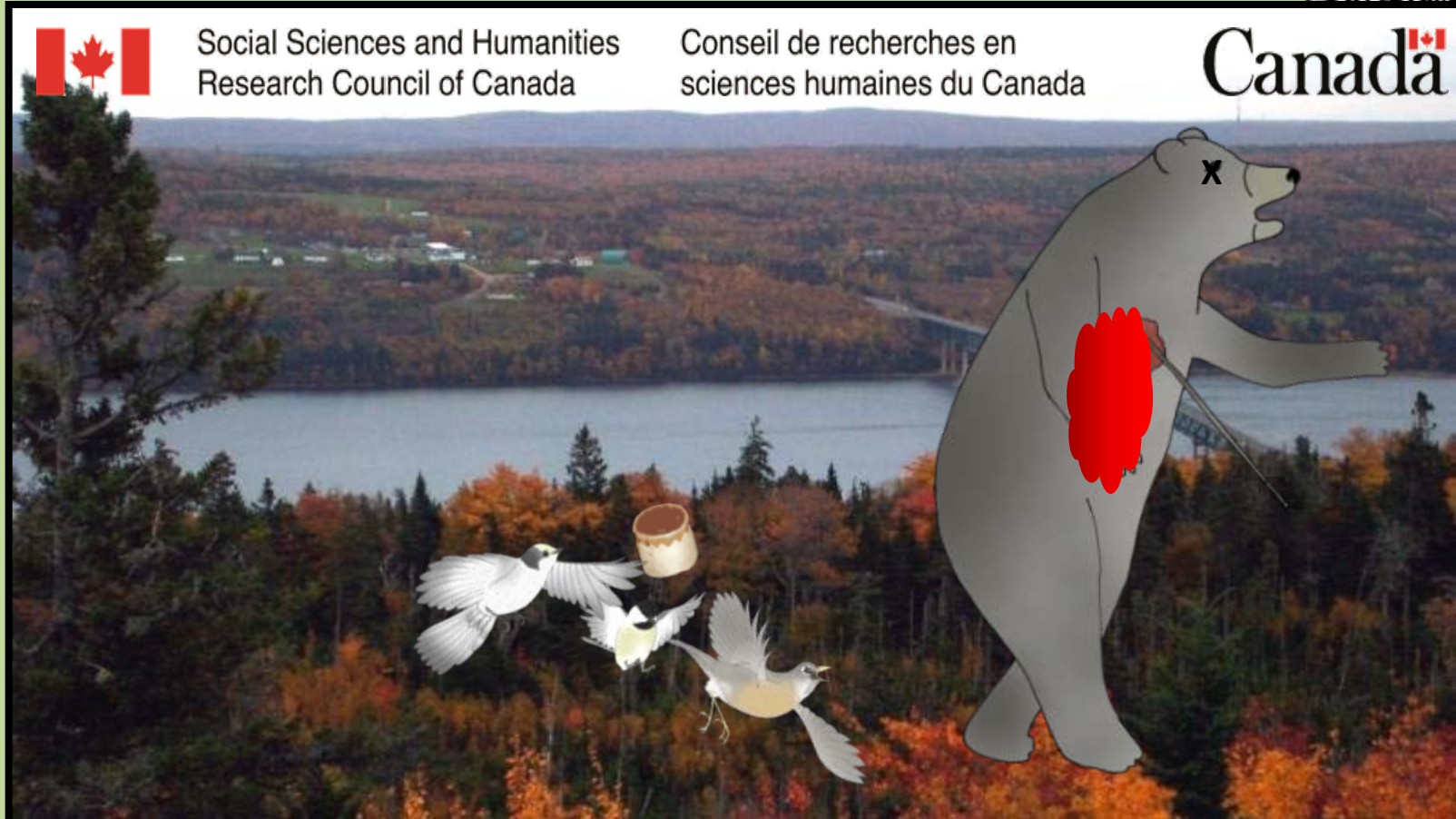
empirical data:
tidal amplification
beginning 3400 BP

model predicts
5000 BP



Aboriginal Knowledge

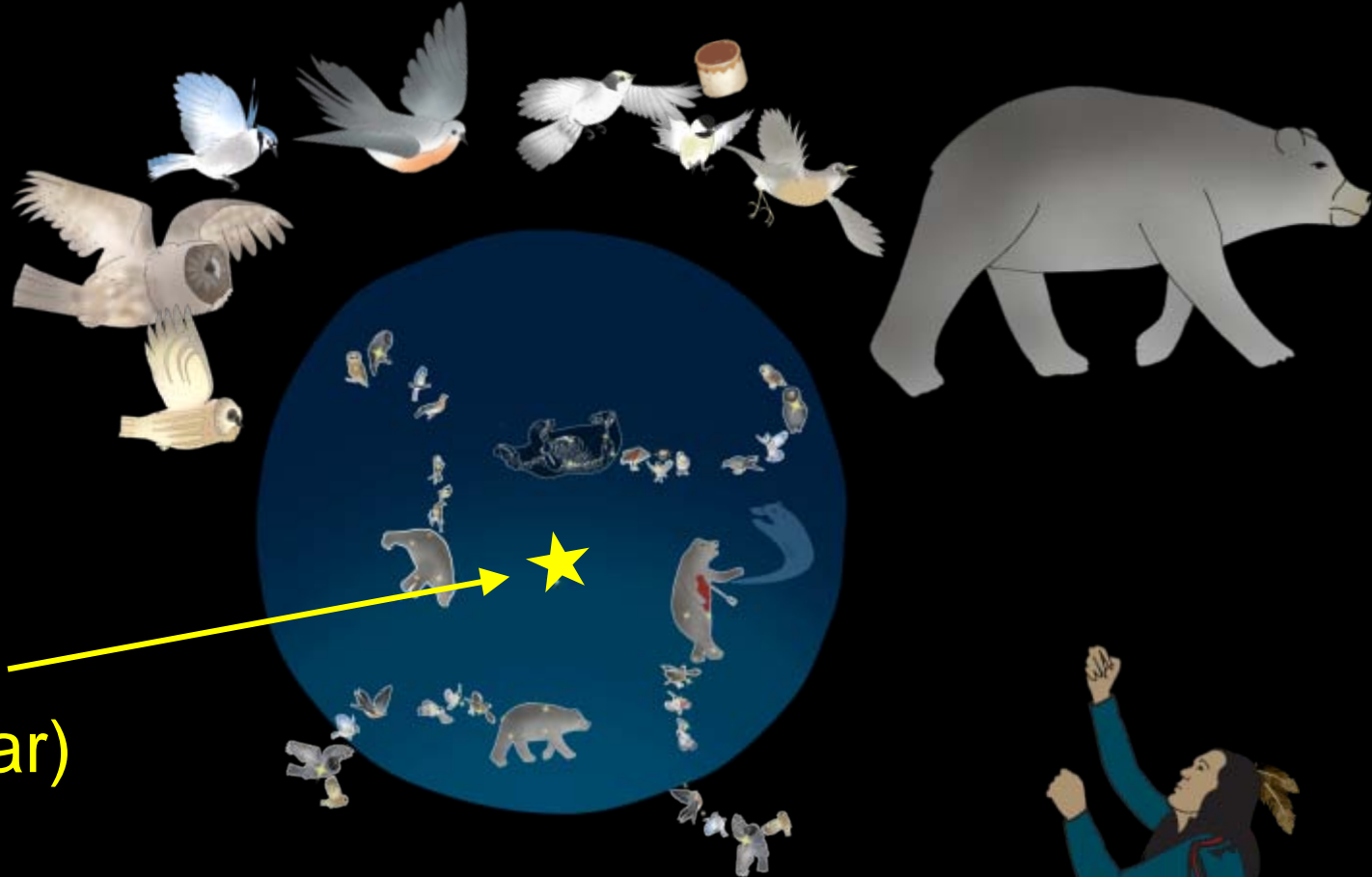
- science of interconnectiveness •



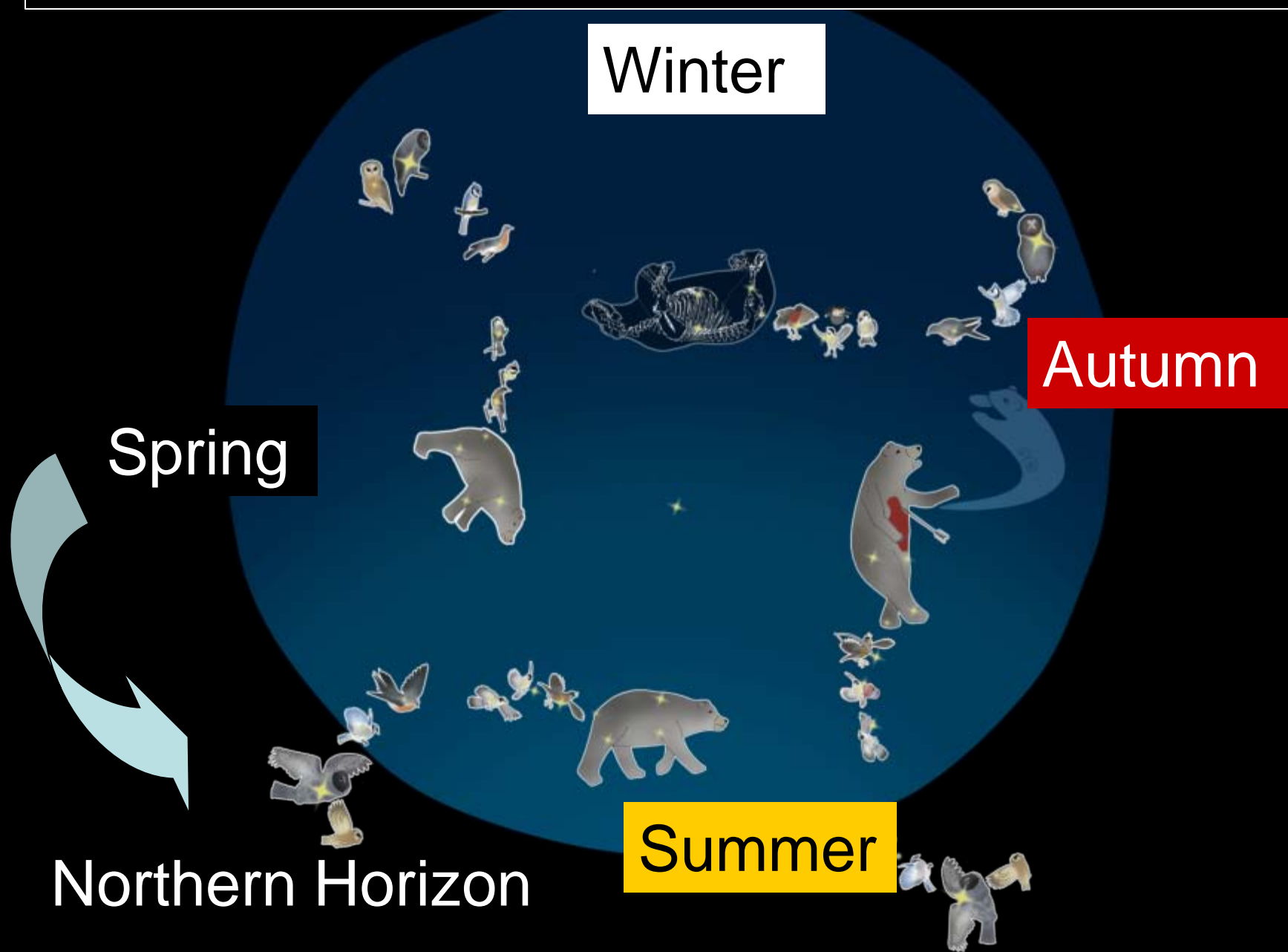
Under the Stars: Muin & Seven Bird Hunters

Tatapn
(North Star)

**Muin and the Seven Bird Hunters:
a Mi'kmaw Night Sky Story
... interconnectiveness of
space-time-life-knowledge-spirit**



meta pattern of the story over one full year



Pemi Pungek Mi'kma'ki

Winter

Autumn

Spring

Summer

This poster is dedicated to all Mi'kmaq Elders.

This poster is a work in progress made by the Institute for Indigenous Studies and Faculty of Cape Breton University and Mi'kmaq Cape Breton Elders. It is a work in progress and will be updated over time. The poster is a work in progress and will be updated over time. The poster is a work in progress and will be updated over time.



CAPE BRETON UNIVERSITY

Mi'kmaw Traditional Knowledge



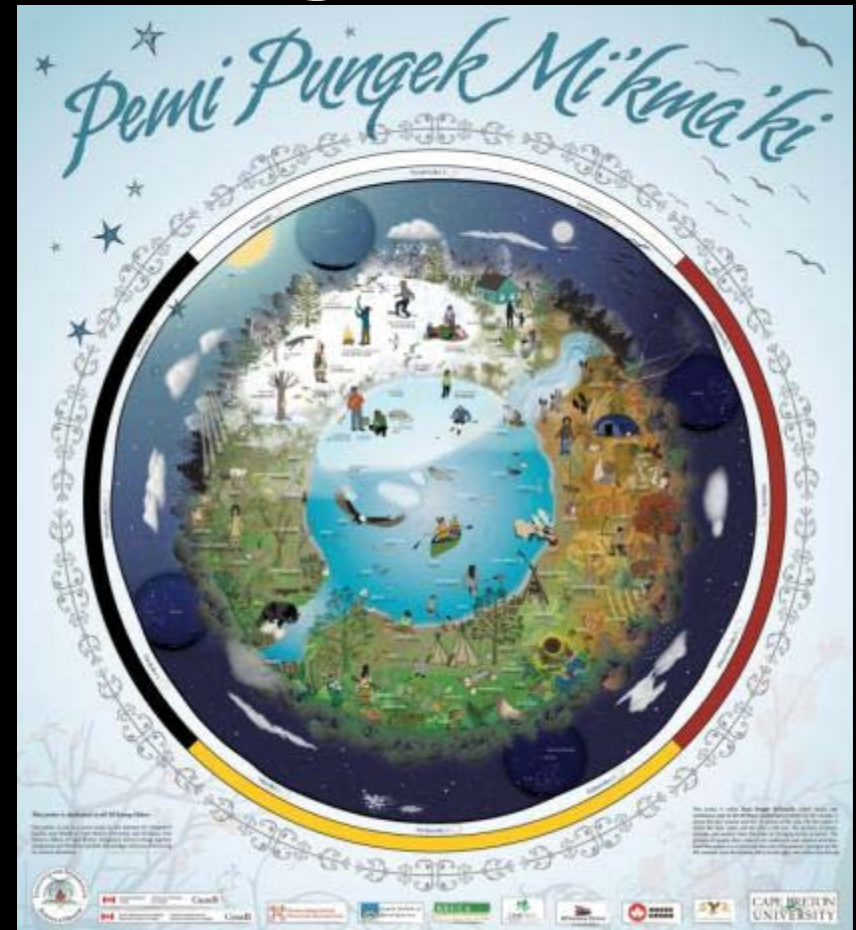
**Love is the main ingredient
of wellness.**

Murdena Marshall



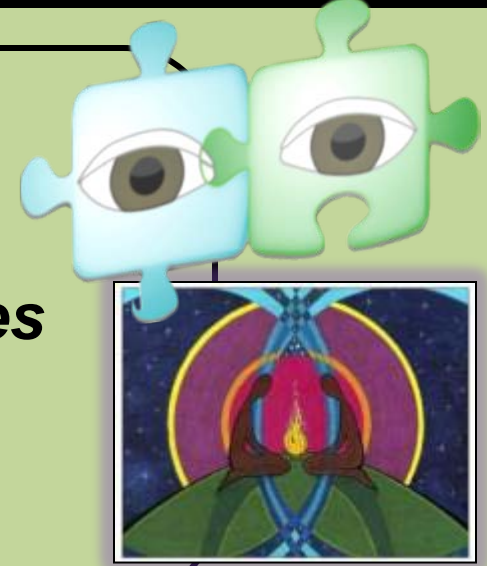
**The voice of
wellness is
in the land.**

Albert Marshall



TWO-EYED SEEING

*an old-new way of
bringing together different perspectives
&
INTEGRATIVE SCIENCE*



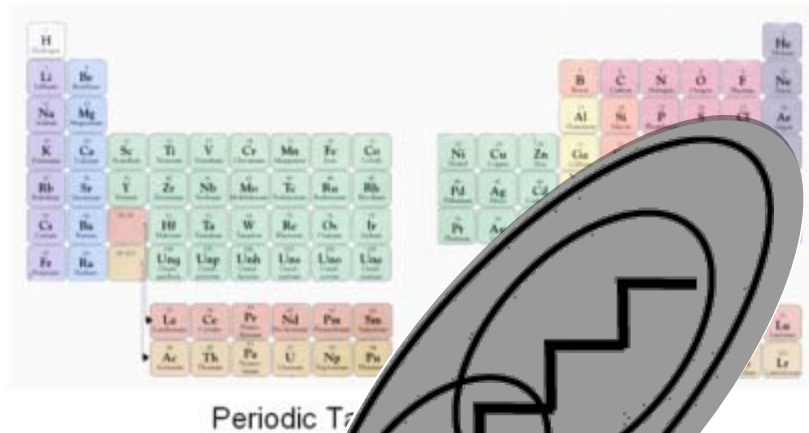
stories of our interactions with and within nature

Science



stories of our interactions with and within nature

Science



Wela'lioq / Thank you



with permission of Tuma Young, photographer



Canada Research
Chairs

Chaires de recherche
du Canada



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

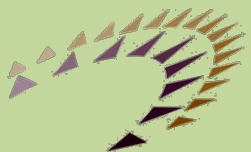
Canada
Canada

Thank you / Wela'liog



IAPH

CAPE BRETON
UNIVERSITY



Canada Foundation
for Innovation

Fondation canadienne
pour l'innovation



Membertou
Elementary

CIHR IRSC

Canadian Institutes of
Health Research

Instituts de recherche
en santé du Canada



NSERC
CRSNG



Mi'kmawey
Debert
CULTURAL CENTRE



IWK Health Centre
Foundation



Mermaid Theatre
of Nova Scotia



Eskasoni First Nation Detachment
Royal Canadian Mounted Police
Gendarmerie royale
du Canada



Mi'kmaq College Institute
Mi'kmaq Espi Kina'matno'kuom

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

for additional information see:

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

Mi'kmaq Sustainable Resources - Eskasoni, Membertou, Potlotek, Wagmatcook, Waycobah

<http://www.uinr.ca>



INTEGRATIVE
SCIENCE



<http://www.integrativescience.ca>