Integrative Science and Two-Eyed Seeing:
Walking & Talking Together

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Walking & Talking Together

Outline of Presentation

• Introduction: Integrative Science & TES
• Seven Lessons Learned
  1. Acknowledge we need each other:
     • Co-Learning Journey
  2. Adopt a Guiding Principle:
     • Two-Eyed Seeing (TES)
  3. View “science” inclusive of two (or more) worldviews
  4. Grow forward: together, we heal
  5. Put our actions, values, and knowledges “out in front”
     • enter “ethical space” \textit{(sensu} Willie Ermine\textit{)}
  6. Use visuals
  7. Weave back and forth between our worldviews
Thank you / Wela’lioq

The support of various partners and funding agencies is gratefully acknowledged.
Toqwa’tu’kl Kjijitaqnn
Integrative Science

Indigenous
Western

“bringing our worldviews together”
Etuaptmumk – Two-Eyed Seeing

Indigenous

Western
Learn to see and use the strengths in multiple worldviews
Is this all just philosophy?

Two-Eyed Seeing is not going to be salvation but rather through these things termed “philosophy” ...

... and, 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.
Traditional Knowledge was never meant to be static and stay in the past ... but rather we must bring it into the present ... so that everything becomes meaningful in our lives and communities.

(Elder Murdena Marshall)
LESSONS LEARNED

over 15+ years
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ...
   co-learning journey
Mi’kmaq Nation
Lnu’k with holistic knowledge have been here a long time.

Extent of ice 11,000 years ago. People lived at the Debert site sometime between 11,000 and 10,000 years ago.

Mi’kmaq Nation
Lnu’k with holistic knowledge have been here a long time.
Lnu’k with holistic knowledge have been here a long time.

Eskasoni First Nation

Unama’ki (Cape Breton Island)

Nova Scotia

Mi’kmaq Nation

Extent of ice 11,000 years ago. People lived at the Debert site sometime between 11,000 and 10,000 years ago.
Lnu’k with holistic knowledge have been here a long time.
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“Traditional Knowledge was never meant to be static and stay in the past … but rather we must bring it into the present … so that everything becomes meaningful in our lives and in our communities.”

Mi’kma’ki today
Ta'ntelo'lti'k (how we are)
Native American Prophecy
Only when the last tree has been cut down;
Only when the last river has been poisoned;
Only when the last fish has been caught;
Only then will you find that money cannot be eaten.
We must use all the skills that we have to preserve and protect our Natural World.

Nature has rights. Humans have responsibilities.

Mi’kma’ki
Netukulimk
“sustaining ourselves”

yes … but really is a much richer concept; it is holistic.
Netukulimk
“sustaining ourselves”

... takes you into a place where you are very conscious of how the human two-leggeds are interdependent and interconnective with the natural world ... this philosophy / ideology is so ingrained in your subconscious that you are constantly aware of not creating an imbalance ...

yes ... but really is a much richer concept; it is holistic.
Netukulimk

Your consciousness is constantly being challenged with the physical part of you and the Guiding Principle is the spirit which creates in you this sense of balance which stops you from overharvesting or exploitation.

You are very cognizant of the fact that you have to make sure that your actions today do not compromise the next Seven Generations … their opportunities and abilities to live in harmony with the natural world. There is this idea that you must always leave something after you, for someone else coming along.

artist Basma Kavanagh
“Co-Learning” ... our way of working collaboratively

**Three Basic Ways**
that transdisciplinary research teams organize their collaboration in order to reach integration:

1. deliberation among experts
2. work by subgroup or individual
3. common group learning

“Co-Learning” pioneered within Integrative Science research program at Cape Breton University in conjunction with Mi’kmaq Elders and educators ... our approach continues to evolve.

OUR APPROACH:

• participatory, action, and praxis-based research: within projects ... teach ourselves how ... use meaningful context
• side by side: Traditional Knowledge and mainstream knowledge
• integrative: respectful acknowledgement of distinct nature of each knowledge system (content not “merged”)
• knowledge systems: “big picture” understandings for ontologies, epistemologies, axiologies, and methodologies
• appreciative: recognize strengths in both knowledge systems
• knowledge holders: recognize it is human-to-human dialogue
“Co-Learning” pioneered within Integrative Science research program at Cape Breton University in conjunction with Mi’kmaq Elders and educators ... our approach continues to evolve.

Why say: “continues to evolve”?

**ONE REASON:** Newhouse (2004) indicates the work of grappling with each other’s cognitive universes and learning to see through the minds of others is the work of generations to come.

Two-Eyed Seeing

RESEARCH
- integrative
- community-based
- participatory
- action
- appreciative

methodologies
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ... co-learning journey

2. Two-Eyed Seeing

Albert Marshall, Elder, Mi’kmaq Nation
understanding this Guiding Principle

Etuaptmumk – Two-Eyed Seeing

Indigenous

Western
Two-Eyed Seeing

Hard to convey as does not fit into any particular subject area or discipline ... is about life ... what you do, what kind of responsibilities you have ... is a Guiding Principle for how one lives while on Earth that covers all aspects of our lives: social, economic, environmental, etc.

**Advantage:**
Because you are always fine tuning your mind into different places at once, you are always looking for another perspective and better way of doing things.
Two-Eyed Seeing

LEARN ... to see from one eye with the best in our 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.
It is not enough to go through life with one perspective; we must embrace all the tools we have ...
Consciousness of Knowing

... our interdependence on each other and on Mother Earth

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

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.

artist Basma Kavanagh
If rates of pollution exceed the natural cleansing capacity of our ecosystems ...
If rates of consumption of resources exceed the carrying capacity of our ecosystems ...
Extinction of any species is forever.

Passenger Pigeon

http://www.pollsb.com/photos/o/31479-last_passenger_pigeon_dies_cincinnati_zoo.jpg
http://www.wunderland.com/WTS/Andy/ProjectEBAY/pics/Death.icon.jpg
Everything that we do to our natural world … … we also do to ourselves
Starving people do not care about environmental sustainability.
Our seasons follow the cycles of Mother Earth ...

... so that our children will always be reminded of the beauty of creation, and of our dependence on her.

artist Basma Kavanagh
Education to our young has to be reflective of how to maintain balance and harmony with our natural world.

artwork: Eskasoni Elementary School Children

artist Basma Kavanagh
We must, through example, inspire our students to be critical in their thinking.
Knowledge is not a tool but rather it is a spirit.

It transforms the holder. It also reminds us that we have responsibilities to the spirit of that knowledge.

We must pass it on.

artist Basma Kavanagh
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.
Only humans have these two consciousnesses ...
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER … co-learning journey

2. 

3. view “SCIENCE” inclusively
Indigenous and Western scientific knowledges are based in observations of the natural world.

view “SCIENCE” inclusively
Indigenous and Western scientific knowledges are based in observations of the natural world.

Stories of our interactions with and within nature ... stories created and understood using our diverse pattern smarts.

Science is dynamic, pattern-based knowledge.
stories of our interactions with and within nature

• recognition
• transformation
• expression

Science

pattern

• various pattern smarts
• various ways to connect the dots
• variety in our stories
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ... co-learning journey

2. view “SCIENCE” inclusively

3. DO ... in a CREATIVE, GROW FORWARD WAY

4. Murdena Marshall, Elder, Mi’kmaq Nation

Together We Heal & Grow
seeing & acknowledging my deeds
“See, in the Mi’kmaq world, in all Native worlds, you have to give recognition to everything: misdeeds, good deeds, past deeds, you know? Anything. You have to give that acknowledgement. Everything that you do, you have to acknowledge it.”

5. put our values + actions + knowledges in front of us ... like an object

Murdena Marshall, Elder, Mi’kmaq Nation

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Murdena Marshall, Elder, Mi’kmaq Nation

Together We Heal & Grow
seeing & acknowledging my deeds

5. put our values + actions + knowledges in front of us ... like an object
the "HEALING TENSE"

5.

ME

actions, values, knowledges

Together We Heal & Grow
seeing & acknowledging my deeds

Murdena Marshall, Elder, Mi’kmaq Nation
“together we heal & grow”

5.
ME & YOU
actions, values, knowledges

Together We Heal & Grow
seeing & acknowledging my deeds

Murdena Marshall, Elder, Mi’kmaq Nation
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ... co-learning journey

2. DO ... in a CREATIVE, GROW FORWARD WAY

3. view “SCIENCE” inclusively

4. put our values + actions + knowledges in front of us ... like an object

5. #5
LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ... co-learning journey

2. use VISUALS

3. view “SCIENCE” inclusively

4. DO ... in a CREATIVE, GROW FORWARD WAY

5. put our *values + actions + knowledges* in front of us ... like an object

6. use VISUALS
5. put our values + actions + knowledges in front of us ... like an object

6. use VISUALS
Willie Ermine (2007)
Fundamental question of cultural encounters is: “How can we reconcile worldviews?”

He suggests implementation of ethical space in which we make “a venue to step out of our allegiances, to detach from the cages of our mental worlds and assume a position where human-to-human dialogue can occur.”

Ermine et al. (2004): Implementation of ethical space first requires an affirmation of its existence. It cannot exist without this affirmation.

put our values + actions + knowledges in front of us ... like an object

4 “BIG PICTURE” KNOWLEDGE UNDERSTANDINGS

ontologies
epistemologies
methodologies
goals

use VISUALS
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR WORLDS

#1

BIG QUESTION

What do we believe the world or cosmos to be? (ontology)
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR WORLDS

#1

BIG UNDERSTANDING ... IN WORDS

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 WORLDS

#1

BIG UNDERSTANDING ... IN VISUALS

interconnective

parts & wholes

CONSTANT CHANGE
within balance and wholeness

EVOLUTION
What do we value as “ways of coming to know” the cosmos? (epistemology)
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 KEY CONCEPTS and ACTIONS

BIG UNDERSTANDING ... IN VISUALS

photo credit: NRC
What can remind us of the complexity within our ways of knowing?
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 LANGUAGES and METHODOLOGIES

#3

BIG UNDERSTANDING ... IN WORDS

Life
Love
Land

vigour

Math & Instruments

rigour

WEAVING

UN-WEAIVING

"Two-Eyed Seeing"
learning to see with the strengths of each & together

"Two-Eyed Seeing"
learning to see with the strengths of each & together
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

BIG UNDERSTANDING … IN VISUALS

Life
Love
Land

vigour

Math
&
Instruments

rigour

WEAVING

UN-WEAVING
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR WORLD VIEWS

BIG UNDERSTANDING ... IN VISUALS

interconnective

CONSTANT CHANGE
within balance and wholeness

parts & wholes

EVOLUTION
The foundational basis for any relationship is an exchange of stories.

(Mi’kmaq Elder Albert Marshall)
Toqwa’tu’kl Kjijitaqnn
Integrative Science

our stories
our stories
my world is “all my relations” (subjects)
Indigenous Science

Sacred Circle Teaching

Indigenous Science

Life

Love

Land

Language

images from: Aboriginal organizations/artists, various sources
Indigenous Science

Life

Love

Land

Language

images from: Aboriginal organizations/artists, various sources
Indigenous Science

Life

Love

Land

Language

images from: Aboriginal organizations/artists, various sources
Western Science
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)
Universe: Visible Matter (levels of organization - biology)

- Universe
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- atoms (natural elements #1-92; artificial elements #93 & higher)
- baryons (neutrons & protons)
- fundamental particles (quarks & leptons)
my world is many “its” (objects)

SCIENCE stories of: parts & wholes
our stories
our stories
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

BIG QUESTION

What overall goals do we have for our ways of knowing?
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

BIG UNDERSTANDING ... IN WORDS

collective, living knowledge to enable nourishment of one’s journey within expanding sense of “place, emergence and participation” for collective consciousness and interconnectedness
dynamic, testable, published knowledge independent of personal experience that can enable prediction and control (and “progress”)
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

BIG UNDERSTANDING ... IN WORDS

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
Two-Eyed Seeing
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

BIG UNDERSTANDING … IN VISUALS

towards resonance of understanding within environment

towards construction of understanding of environment

from: CCL Aboriginal Learning Knowledge Centre (www.ccl-cca.ca/CCL)

from: www.leads.ac.uk
Four Big Patterns for Integrative Science & TES

recognize and affirm our need to enter ethical space ... and learn to take first steps
7. WEAVE back & forth between our worldviews
One Complete Year

2010

January
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

February
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29

March
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

April
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29

May
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

June
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

July
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

August
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29

September
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

October
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

November
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

December
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30
One Complete Year

Netukulimk
7 basic or fundamental LESSONS LEARNED

1. ACKNOWLEDGE WE NEED EACH OTHER ... co-learning journey

2. put our values + actions + knowledges in front of us ... like an object

3. view “SCIENCE” inclusively

4. DO ... in a CREATIVE, GROW FORWARD WAY

5. use VISUALS

6. WEAVER back & forth between our worldviews
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.
Wela’liiq
Thank you
Thank you / Wela’lioq

The support of various partners and funding agencies is gratefully acknowledged.
Subject: Cultural Awareness training / SARA ATK session - 2.5 day  
Location: 2nd Floor boardrooms, 401 Burrard

Start: Mon 01/03/2010 8:30 AM  
End: Wed 03/03/2010 12:00 PM

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Day 1 - “Working Effectively With Aboriginal Peoples” (8:30 - 4:00 Boardroom D, 2nd Floor RHQ)

An experienced trainer from Indigenous Corporate Training will come and deliver the full day training session. Although not mentioned in the attached document, I have requested that SARA-specific information be incorporated into the session.

Day 2 - DFO-SARA ATK session (9:00 - 3:30 Boardroom C, 2nd Floor RHQ)

The morning will include presentations on "Integrative Science" and the "Two-Eyed Seeing" by Dr. Cheryl Bartlett and Mi'kmaq Elder Albert Marshall from the Integrative Science program at Cape Breton University.

Dr. Cheryl Barlett holds the Tier 1 Canada Research Chair in Integrative Science for the concept pioneered at CBU by which Aboriginal and Western worldviews in science and education are brought together for the benefit of all people. "Integrative Science introduces Aboriginal understandings of nature into the post-secondary science curriculum, and it recognizes the differences and common ground between both views".

Integrative Science brings together scientific knowledges and ways of knowing from Indigenous and Western worldviews to provide science education. This “bringing knowledges together” is known as Toqwa’tu’kl Kjijitaqnn in the Mi’kmaq language and as “Two-Eyed Seeing” in the words of Mi’kmaq Elder Albert Marshall. “Two-Eyed Seeing” is more than a label ... it is a powerful reminder of the Integrative Science program's visionary goal of learning to see from our one eye with the strengths of Indigenous knowledges and from our other eye with the strengths of mainstream scientific knowledges...and to use these together for the benefit of all.
Melinda Lontoc-Roy (DFO-NCR, Aboriginal Policy & Governance) will provide an update on the development of the "DFO-SARA ATK Guidance" document that was introduced to us last summer. The remainder of the afternoon will be spent looking at specific sections of the document and providing our comments and input. The draft changes daily, so I'm sure this isn't the most up-to-date version but it will give you an idea of its contents.

Day 3 - DFO-SARA ATK session cont'd (9:00 - noon Boardroom C, 2nd Floor RHQ)

Continuation of Day 2 discussions.
CFR AFSAR Forum 2
UPPER FRASER FISHERIES CONSERVATION ALLIANCE
March 4th, 2010
RAMADA INN, Cranbrook Room
Prince George, BC
9.00 am – 4.00 pm
Lunch Provided

Objectives

1. Summarize Project To Date
2. Review Community thoughts on ATK incorporation into SARA/recovery plans
3. Discussion of the DRAFT ATK Protocol Template

1. Introductions

2. Project Update/Overview
   • Summary of Working Session (February 12th)
   • Summary of Literature Review
   • Summary of AFSAR CFR Practical Work

3. Louvi Nurse Presentation
   • PowerPoint - Aboriginal Traditional Knowledge in SARA Implementation: An Overview of the Interim Operational Guidance Document
   • DRAFT 1 - Aboriginal Traditional Knowledge in *Species at Risk Act* Implementation - Interim Operational Guidance Document
   • Question/Answer Period

   HEALTH BREAK

4. Elder Albert Marshall/Dr. Cheryl Bartlett Presentation
   • “*Integrative Science and Two-Eyed Seeing: Talking and Walking Together*”.
   • Question/Answer Period
LUNCH BREAK

5. Pamela Perreault
   • Use and Sharing of ATK
   • Question/Answer Period

HEALTH BREAK

6. CFR Presentations (Summary of Information collected)
   • Randy Billyboy - Tsilhqot’in National Government
   • Juanita Alec – Nazko First Nation
   • Andrew Meshue – Williams Lake Indian Band
   • Albert George – Saik’uz First Nation
   • Christina Ciesielski – Carrier Sekani Tribal Council
   • Cheryl Pierre – Tl’azt’en First Nation
   • Carl Frederick – Lheidli T’enneh

7. Discussion Period
   • Protocol Template Draft
   • Community/Elder comments