

Pjila'si Bienvenue Welcome

UNESCO Southwest Nova Biosphere Region



United Nations
Educational, Scientific and
Cultural Organization



Southwest Nova
Biosphere Reserve

www.swnovabiosphere.ca

“Addressing Ecological Stressors and the Role of UNESCO Southwestern Nova Scotia Biosphere Reserve”.

Prepared by Cliff Drysdale Aug 2019



A Team effort

The UNESCO Southwest Nova Biosphere Reserve was designated on Sept 11/2001 in recognition of its ecological significance, scientific role, and rich cultural heritage.

Development of UNESCO Southwest Nova Biosphere Reserve Association(SNBRA) programming requires a huge effort by volunteers on its board of directors including Dave Sollows (Co Chair), Linda Gregory (Co-Chair), John D Sollows (Secretary, Recognized Agent), Cliff Drysdale (Vice Chair), Steve Malay (Past President), Aurel Mooney, Phillip Mooney, J. Peter Hall, Hague Vaughan, Carl Deveau, Mary Manning, Gil Johnson, Michael Gunn,

The board has representatives from municipal councils, communities and businesses that facilitate collaboration with institutional partners. Learn more about these initiatives by accessing the SNBRA website www.swnovabiosphere.ca

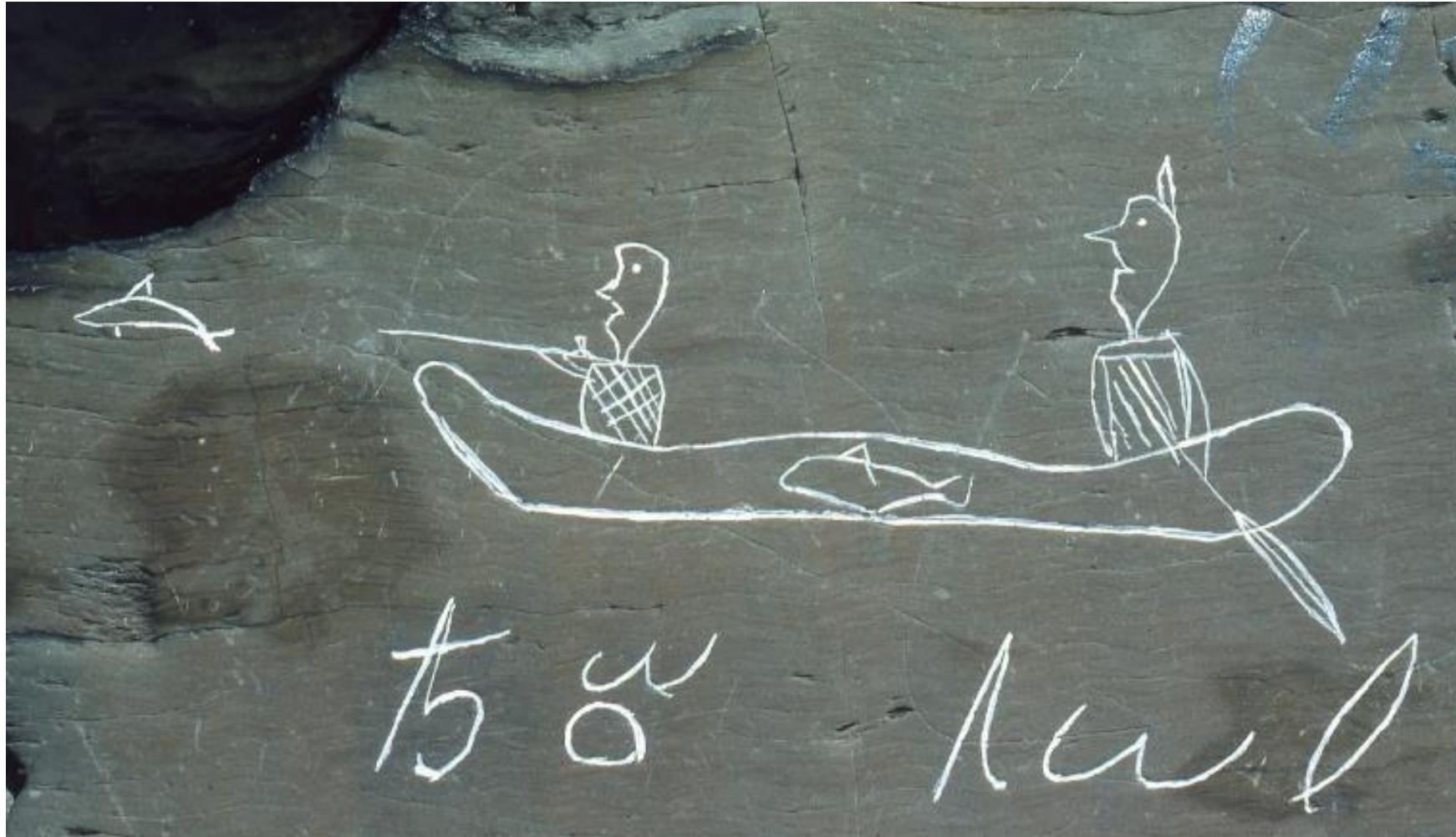
To fully sustain and enhance SNBRA programming there remains a fundamental need for a salaried staff programme coordinator, and collaboration with potential funders to assist with projects.

Why is southwestern Nova Scotia scientifically important for stressor assessment from a national and international perspective?

1. Due to its geographic position downwind from North America and unique sensitivities the region is vulnerable to long range transport of air pollutants, climate change impacts, biodiversity and invasive species threats.
2. Southwestern Nova Scotia features a high level of ecological research and monitoring by Government of Canada and Nova Scotia agencies, 5 universities, technical colleges, NGO's and volunteers, many using principles of 'open science/open data. Significantly the Atmospheric Environment Service (AES) of Environment and Climate Change Canada has operated an atmospheric monitoring station publishing high quality baseline data since the 1980's.
3. The Southwest Nova Biosphere Biosphere Region can serve as a global benchmark for science and geomatics technology, responsible environmental management, and civic development to support rural sustainability.

With a population of approximately 100,000 persons SWNS rural communities have depended on the sea, forests and agriculture to support their social well being.

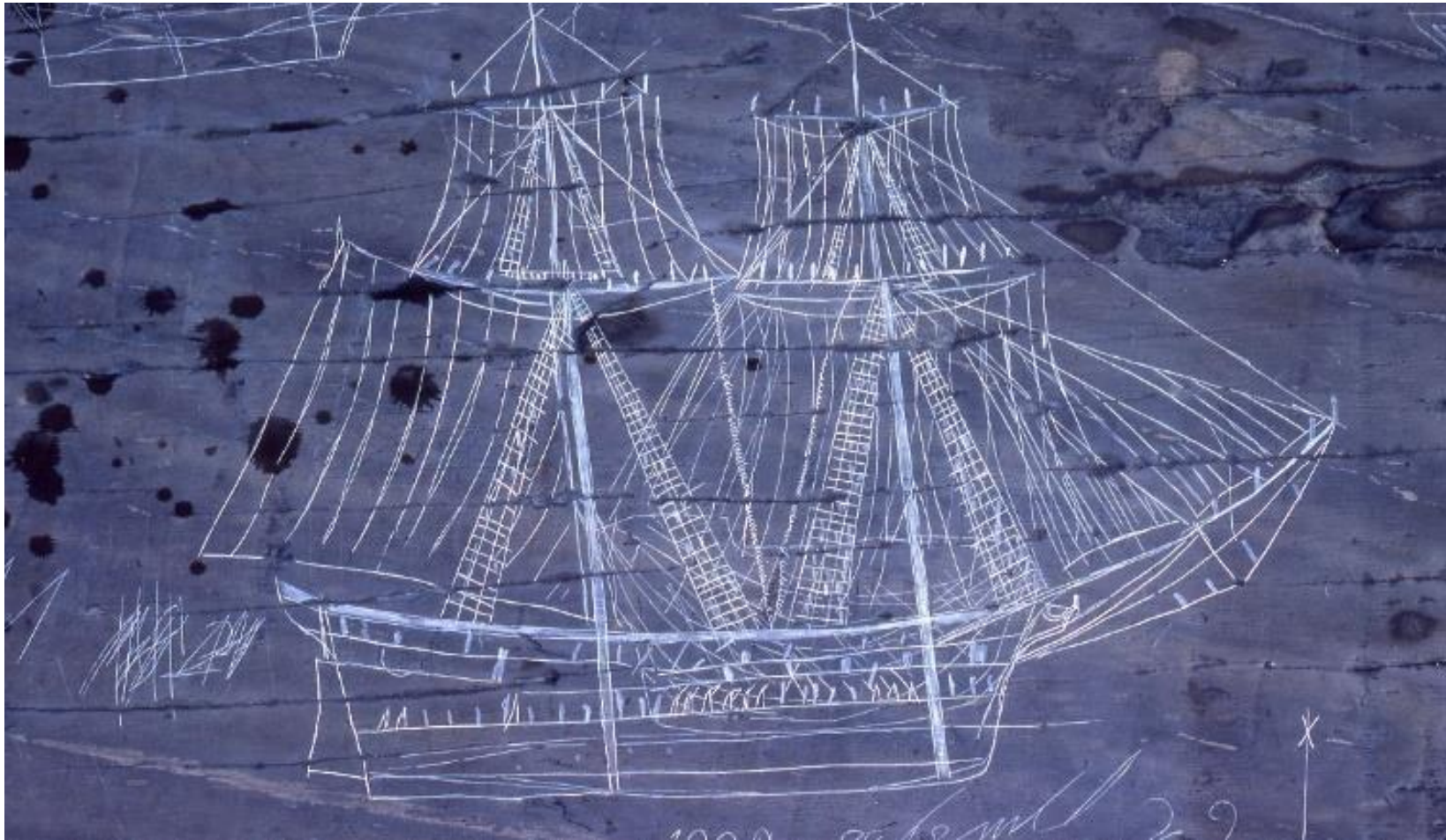
Sustainable resource management: “The application of sustainable practices in the categories of businesses, agriculture, society, environment and personal life to benefit current and future generations.” (Wikipedia)



The Mi'kmaq people were the first inhabitants of 'Kespukwitk'

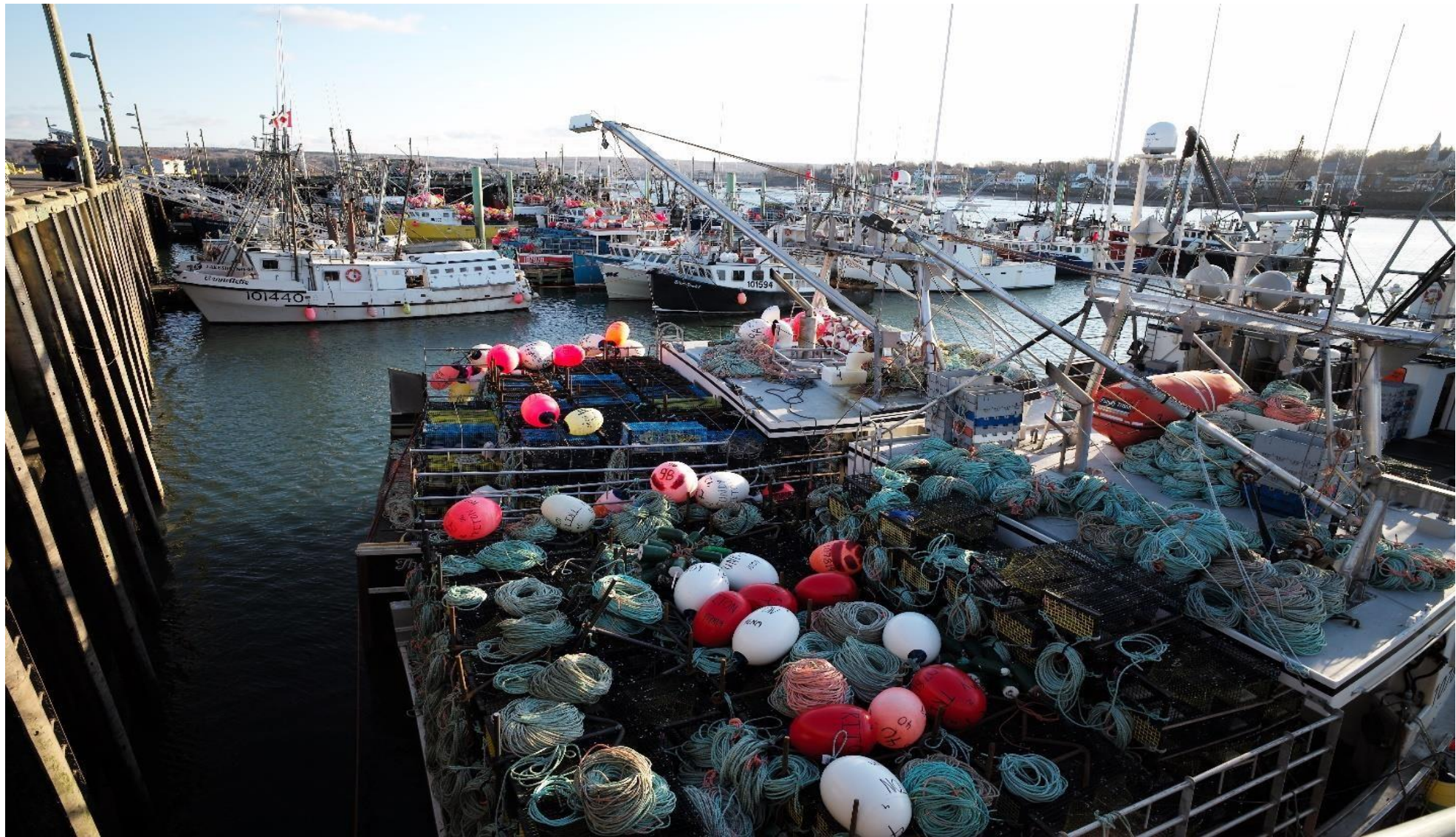


Europeans settled first at Annapolis Royal in 1605



From ship building to home construction, paper products and fuel, the forests have been used by successive generations.

Check out the SNBRA “Touring Through Time” app!



The fishing industry depends on sustainable management of a 'renewable resource'



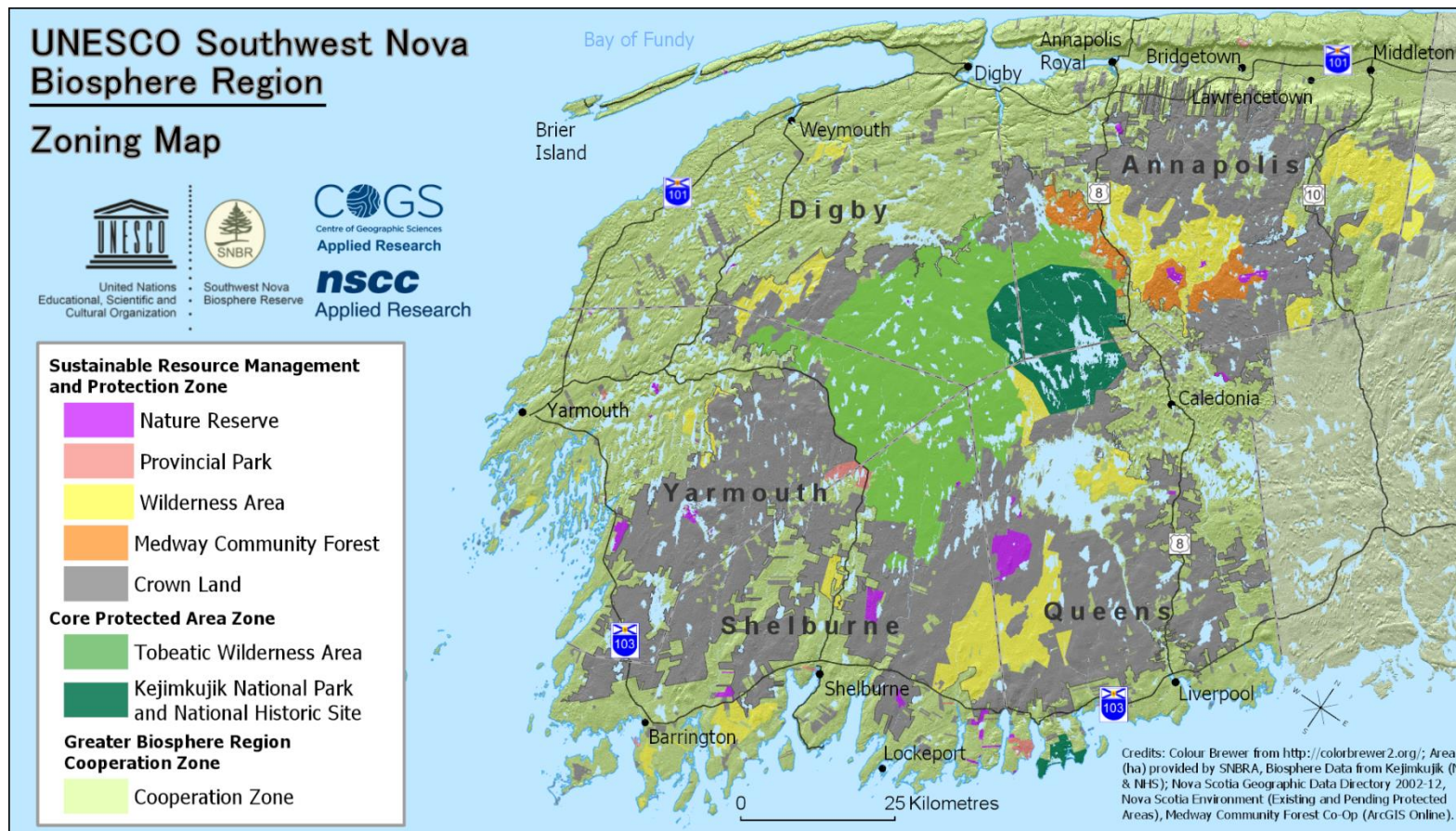
Agriculture is an important component of rural sustainability in our region.



Precipitation, streams, rivers and lakes could be considered the 'bloodstream' of the ecosystem

What role could SNBRA play to address its scientific mandate including advancing science and education while supporting sustainable resource management and biodiversity protection?

1. Revised Southwest Nova Biosphere Region zoning: Developed in 2017 with the input of Parks Canada, NS Environment, the Department of Lands and Forestry and the Canadian Commission for UNESCO. Natural resources in the region are managed by various government agencies and many private landowners.



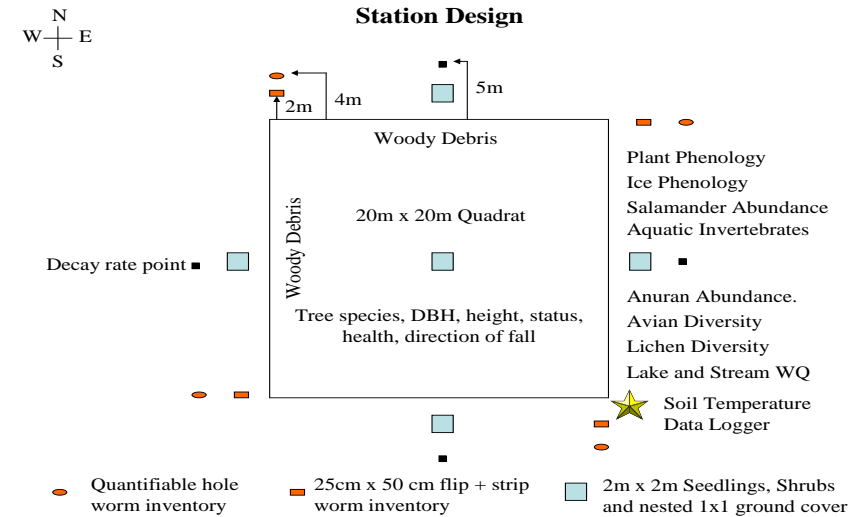
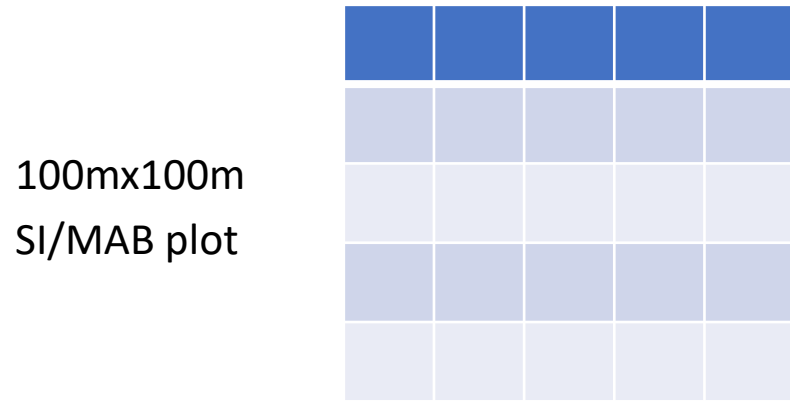
2. Development of the “Interactive Science Atlas”

Create ‘one stop shopping’ tool for accessing ecosystems information, with field utility using smartphone and geopositioning technology.

- Provide public, student, planners, landowners and resource decision makers ready access to information on ecological dynamics to advance research, understanding, and sound resource management.
- Collaborate with the NSCC Centre of Geographic Science, the NS Department of Lands and Forestry, other agencies and NGO’s at the municipal, provincial and federal level to demonstrate the information management capabilities and scientific importance of the SWN Biosphere region and seek support for further project development.
- Complement activities of scientific researchers and resource managers while avoiding competition for funds with local environmental NGO’s.

www.scienceatlas.ca

Encourage use of standardized IM protocols including online metadata, data dictionary and data access to advance application of the “Data Cube” concept.



Facilitate multi-variate analysis for stressor assessment, research hypothesis development, resource use planning and student education.

Increase the “Interactive Science Atlas” utility including smartphone ge positioning capability for in-field use as a tool for woodlot management planning, riparian zone and species at risk protection, municipal planning.

Explore opportunities to develop the “Interactive Science atlas” concept at regional, national and international scales, e.g. UNESCO Sarlat and Dublin EuroMAB conferences



Interactive Science Atlas

Explore, Build, Discover & Share the Southwest Nova Biosphere Reserve.



3. A Project Proposal for Further Interactive Science Atlas Development Including Coastal Marine and Greater Nova Scotia Coverage:

Prepare a **coastal marine component** to capture information and data on ecological structure including tidal and current dynamics, biodiversity and its use.

Develop a **Teacher/Student Workbook** that provides project exercises using the ‘Southwest Nova Interactive Science Atlas’, in consultation with a committee of educators including from the Mi’Kmaq community.

Refine and further develop the functionality of the application. Use information management quality assurance procedures based on the ‘open data and data cube’ concepts to increase accessibility to quality scientific information and data.

-Public education and Interpretive Centre – The “Culture, Heritage, and Science Interpretive Centre” in Yarmouth, Nova Scotia can be used as a venue for presenting programming for visitors and students. Facilitate discussions on Science Atlas applications as a tool for advancing sound information management, stressor impact assessment, research planning and adaptive management response. Additional map and information coverage could include the whole of the Province.



Interactive Science Atlas Application for ‘Communities in Bloom’?

- Use ecoregion boundaries and a hierarchical ecological ‘app’ framework to facilitate linking with available Geographic Information Systems (GIS) spatial and temporal information/data associated with community ecosystems.
- Develop education tools featuring local ecosystem dynamics and realistic class exercises in collaboration with universities, community colleges and schools, agencies, NGO’s.
- Research and monitoring plan development
- Zoning development, urban green spaces management, watershed management
- Environmental stressor impact assessment and modelling
- Documenting success stories for climate change response
- Use “Interactive Science Atlas” GIS concept to improve access to data and information for socio-economic applications.

Acknowledgements

- The “Interactive Science Atlas” development team includes Ian Manning who deserves special acknowledgement for atlas design, Bill Livingstone, David Colville, Dr. Tim Webster, Kate Collins and Allen Huang (Atlas Light) of the Nova Scotia Community College (NSCC), Centre of Geographic Sciences (COGS), and Applied Geomatics Research Group of the Lawrencetown and Middleton campuses, and Cliff Drysdale, Dr. Peter Hall and Bryan Mood of SNBRA.
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- The Southwest Nova Biosphere Reserve Association “Interactive Science Atlas” project was funded by the Nova Scotia Department of Lands and Forestry.
- The Science Atlas is built using Esri Story Map, ArcGIS, ArcGIS Server and ArcGIS Online technology.

Suggested reading:

Southwest Nova Biosphere Reserve Management/Action and Strategic Plan. July/17.

A Strategy to Advance Geographic Science, Sustainable Resource Management, and Education in the Kespukwitk Region, UNESCO Southwest Nova Biosphere Reserve. Jan 3/19.

Experimental design considerations for plot-based monitoring; a discussion paper. 2007. Clifford Drysdale
Dr. Lee-Ann Hayek, Marlene Doyle, Sally O'Grady, Dan Kehler. Environment Canada, Ecological Monitoring and Assessment Network Contract # K0257-05-0050.

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