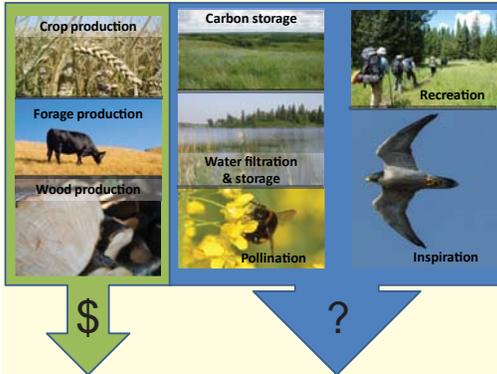
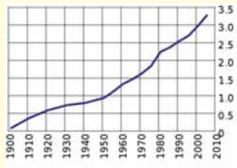


Good question

We need nature to support our health and wellbeing.



Because many ecosystem services don't have a clear economic value, they are often overlooked when people make decisions about land use and development.



As our population grows, the capacity of Alberta's ecosystems to provide these benefits is being stretched.

It's hard to say...

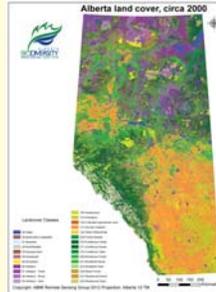
Ecosystems are complicated & costly to measure. And some people don't like the idea of putting a price on nature.

Assessments of ecosystem services need to be:

Grounded in Science: Credible & verifiable to provide assurance that applications such as market transactions are fair & transparent

Easily Understood: Communicated in terms that are simple & intuitive, so that people understand the numbers

Cost effective: Lean heavily on available sources of information, existing knowledge & rapid, inexpensive methods



A wall-to-wall Land Cover Map a key part of an ecosystem service assessment.

This 2000 map is a blending of two pre-existing land-cover maps: the Canadian Forest Service's Earth Observation for Sustainable Development map of the forested region, and Agriculture Agri-Food Canada's map of the agricultural zone.

This is the best complete representation of Alberta's land cover currently available. A 2010 version has also been completed.

Field data are an important part of any assessment of ecosystem services. We use data collected by ABMI field technicians, and combine it with other publicly available datasets.



We're on it

With support from ALMA and other sponsors, the Alberta Biodiversity Monitoring Institute is leading a collaborative effort to assess the supply and value of several ecosystem services across Alberta. And we are demonstrating how this new knowledge can be used to improve our environment through regional planning, market-based approaches and sustainability reporting.

Collaborators



The Alberta Biodiversity Monitoring Institute is an arm's-length, not-for-profit scientific organization. The Institute provides relevant scientific information on the state of Alberta's biodiversity and ecosystem services to support natural resource and land-use decision making in the province.



Green Analytics is an independent, for-profit consulting firm rooted primarily in the social sciences and focused on environmental, energy and natural resource issues.



The Miistakis Institute envisions a world where communities have genuine access to the science and research they need to make choices that promote healthy landscapes.



The Environment and Carbon Management division of Alberta Innovates Technology Futures provides expertise in economic and environmental modelling to support market approaches to resource management issues.



Core Sponsors



Ecosystem Service Assessments

Forage production

In Alberta's Grassland and Parkland Natural Regions, estimated average annual forage production is 1721 kg/ha and 1120 kg/ha, respectively. This amounts to over 5 million tonnes of forage produced by native grassland in these regions. Based on the estimated cost of feed used to supplement livestock grazing at \$55/t, annual native prairie forage production is valued at close to \$300 million. Source: S. White, in prep.



Carbon storage

For native prairie in Alberta's Grassland and Parkland Natural Regions, estimated average soil carbon storage is 26 tonnes/ha and 38 tonnes/ha, respectively. For both regions, approximately 115 million tonnes of carbon is stored in native prairie soil. Based on conservative estimates of soil carbon lost in conversion from native prairie to cropland, native prairie is storing an extra 81 million tonnes of carbon compared to alternative land use; equivalent to the carbon emitted by 61 million cars in one average year. Source: S. White, in prep.



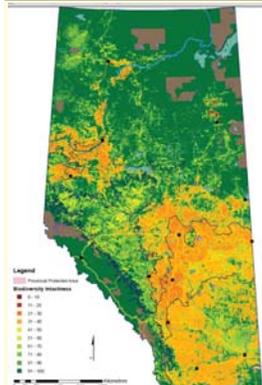
Biodiversity

Biodiversity is foundational and required in varying degrees for the delivery of many ecosystem services. Biodiversity can be treated as an ecosystem service because of its' cultural and other intrinsic values.

To assess the status of species and habitat elements, the ABMI collects and analyzes data on breeding birds, winter-active mammals, armoured mites, vascular plants, mosses and liverworts.

To report on the status of species and habitat elements, the ABMI has developed the Biodiversity Index.

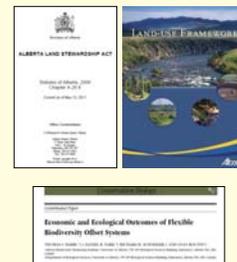
The index ranges from 0% to 100%.



Ecosystem Service Applications

Market design and the value of biodiversity offsets

The Alberta Land Stewardship Act has enabled the use of conservation tools that provide economic incentives for avoidance and mitigation of negative environmental impacts. These tools have not yet been deployed.



In situ Project



Surface Mine



Mine
Tailings Pond

Mine

Tailings Pond

Mine

Tailings Pond

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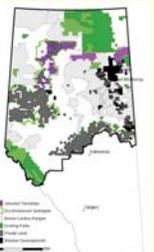
Mine

Tailings Pond

We used maps of ABMI's biodiversity index to identify locations to protect & restore, thereby offsetting the loss of biodiversity caused by oil sands development through 2020, and assumed all losses would be offset.

Key findings

1. The cost to industry of a biodiversity offset system depends on its design. We found 100-fold differences in cost among the several designs we evaluated.
2. Replacing the exact vegetation types lost to development is more expensive than simply replacing the same area of natural habitat.
3. Other design constraints are less costly to implement, and could support regional conservation priorities like caribou conservation and protected areas.



Market access and the sustainability of Canada's beef industry



There are multiple provincial, national, and international processes in play to assess the environmental, social, and economic sustainability of Canada's beef industry.

Building on methods developed to analyze the greenhouse gas implications of the agriculture industry and other sectors, this project is contributing to the question:

What are the positive and negative impacts of beef production on biodiversity and ecosystem services?

