

# No money, no answers

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Alberta's Oil Sands Region (OSR) spans 142,000 square kilometres across northern Alberta, encompassing more than one fifth of our province's land area. Approximately 30% of this region is comprised of two types of wetland ecosystems – bogs and fens. These wetlands are productive landscapes dominated by the presence of sphagnum (aka. peat) mosses which play a crucial role in the maintenance of healthy watersheds and provide much needed habitat for a host of wildlife species such as migratory waterfowl. Over the past several decades, industrialization has increased pressure on Alberta's wetlands resulting in the loss and degradation of these ecosystems. Continuous monitoring and mitigation of human impacts is a paramount precondition for maintaining healthy wetland ecosystems into the future.

The Oil Sands Monitoring program (OSM) began in 2015 as a collaboration between the Governments of Canada and Alberta. It replaced the previous Joint Canada-Alberta Oil Sands Monitoring (JOSM) program that operated for three years beginning in 2012. The OSM program was created to monitor, evaluate, and report on the environmental impacts of oil sands development in the OSR, to assess the risks of impacts, and improve our understanding of the state of the environment in an open and transparent manner. OSM seeks to answer the following three questions which guide all monitoring and research efforts of the program: A) Is there a change in ecosystem state? B) Is the change due to oil sands development? C) What proportion of the observed cumulative effects can be related specifically to oil

sands development?

Alberta Wilderness Association (AWA) has participated in the OSM program since its inception (and the transition from JOSM); AWA has been the sole ENGO representative on a number of Technical Advisory Committees (known as TACs), which are accountable for designing monitoring programs to address the priorities set out by the Oversight Committee. TACs work in conjunction with an Indigenous Community Based Monitoring Advisory Committee to identify opportunities and develop recommendations for the funding of key components within the annual work plan cycle and report directly to the Science and Indigenous Knowledge Integration Committee. TAC delegates are selected to serve a maximum three-year term and AWA currently participates on the wetlands, terrestrial biodiversity, and groundwater TACs.

Alberta's Wetland Policy – published in September 2013 – dictates the Government of Alberta's strategic intent for the management of wetlands in the province. It proclaims the explicit goal of conserving, protecting, and managing Alberta's wetlands to sustain the benefits they provide to the environment, society, and the economy. OSM's wetland monitoring program is intended to support the Alberta Wetland Policy through evaluation of, and reporting on, the status of wetlands areas over time. To achieve this objective, research projects need to be funded as part of the annual work plan cycle, and these projects require continuous funding to ensure that their research can remain ongoing and adequately track wetland status over time as intended.

However, this isn't always the case.

Since 2009, Dr. Kelman Wieder (Villanova University), Dr. Melanie Vile (West Chester University), and Dr. Dale Vitt (Southern Illinois University) have been involved in the wetlands monitoring portion of the OSM program. They are studying the impacts of oil sands development on both bogs and fens in Alberta's OSR and are making important findings in the process. One of the key findings from their research is the observation that atmospheric nitrogen emissions produced through oil sands operations have continued to increase over the past 20 years. This has greater concentrations of nitrogen to be taken up by wetland ecosystems – leading to significant changes in ecosystem species composition and mineral deposition regimes.

For context, bogs are classified as ombrogenous and ombrotrophic. This means they receive all water and nutrients from precipitation. Fens, on the other hand, are considered geogenous – connected to a ground or surface water source, yet minerotrophic – receiving nutrients from both precipitation and groundwater. These characteristics make both bogs and fens highly susceptible to mineral deposition from external sources, such as the nitrogen and sulfur produced through oil sands operations. The effect of this mineral uptake could have negative consequences for Alberta's wetland ecosystems in the OSR.

Across two studies conducted over a five-year period, the researchers from Villanova University experimentally added nitrogen to bogs and fens within the Mariana Lake peatland complex, a wetlands area south-



*The patterned fen of the McClelland Lake Wetland Complex. The patterned character of this remarkable fen is the result of flarks (depressions) and strings (raised ridges where spruce and other trees grow). PHOTO: © C. WEARMOUTH*

west of Fort McMurray. These experiments simulated rainfall according to various nitrogen deposition scenarios in order to assess the responses of both ecosystems to nitrogen addition – much like what can happen as a result of oil sands operations. The uptake of excess nitrogen by these environments resulted in a shift in species composition within both bog and fen ecosystems. It led to a decrease in peat moss abundance and an increase in the growth of shrubs. This transition could change the landscape further because increasing shrub cover can shade peat mosses from sunlight. This hinders their productive abilities and further decreases their abundance. This transition from a moss-dominant to shrub-dominant landscape reduces the primary productivity of bogs and fens, meaning that oil sands operations are likely a source of direct harm to the the productivity of nearby wetlands

through atmospheric deposition.

Following these two studies, in 2020 the Villanova University research team published another paper which outlined a standardized protocol for monitoring plant responses to changing nitrogen deposition regimes in Alberta's bog ecosystems. This paper recognized that, at the time, there were no detailed or established protocols for monitoring the potential changes that nitrogen deposition could elicit in these sensitive boreal ecosystems. Therefore, they saw the need to create and publish one of their own. The protocol outlined in this paper is intended to be user friendly. It will allow for monitoring potential plant and lichen responses to future nutrient inputs into wetland environments while providing a structured and replicable method for collecting data.

The development and application of this

monitoring protocol should be paramount to ongoing wetland monitoring activities under OSM to ensure that the impacts of mineral deposition on wetlands are recorded over time. Unfortunately, in June 2021, the Villanova University research team was ordered to suspend their work, because their research was not going to be funded under the current year's budget. Instead, the project team was instructed by the Oversight Committee to focus on transitioning to core monitoring work in consultation with the TAC. This news came as a shock to Dr. Wieder as well as others involved in the wetlands monitoring TAC. In response to the decision, Dr. Wieder penned a letter to AEP, outlining a summary of the important work completed to date, and sharing his own disappointment at the decision not to fund their research under the current work plan.

The atmospheric deposition research was not the only study that suffered in the 2021 budget, as the wetlands TAC overall only received 45% of the funds it requested. Part of the issue is that the total funding available for OSM each year is set at roughly \$50 million, which was negotiated with oil sands companies nearly a decade ago at the onset of the original JOSM program in 2012, and has remained static ever since. This constant sum must be distributed amongst all OSM programs annually. Because it loses value each year due to inflation, it becomes more and more difficult to fund all the intended, and much-needed, research. It is important that monitoring activities be cost effective to ensure that the available funds are mobilized in a suitable manner. However, the cost of monitoring is only increasing and this arbitrary limit of \$50 million merits reevaluation if it is insufficient to fund the

research needed to protect these important ecosystems. Looking at inflation alone, the Bank of Canada inflation calculator states that that \$50 million in 2012 dollars is equivalent to \$58.5 million in 2021, yet the monitoring budget continues to remain static regardless of inflation or the need for additional monitoring resources.

Following the funding announcements, several TACs have raised a shared concern about the lack of transparency regarding the reasons why projects are funded or not. Using Villanova University's situation as an example, there seems to be no clarity on why their research was deemed suitable in previous years, but not in 2021. If their research met the priorities set by the OSM Oversight Committee last year, then has something changed over the past year to make this monitoring work unsuitable? The lack of any clearly communicated justifications

makes this decision difficult to understand and to support, especially given the importance of their research to date.

AWA has supported Dr. Wieder's research over the time that we have been involved in the OSM program and we were hoping to see it continue into the future. The long term impacts to wetlands from industrialization need to be monitored to ensure that Alberta maintains the health of its wetland ecosystems and meets its own goals outlined in the Wetland Policy. There can be no benefits of wetlands for us to enjoy without the wetlands themselves, so we need to ensure that adequate checks and balances are in place to protect them. We hope to see Dr. Wieder's research funded appropriately in the future. 🌱



Ground level view of a flark and string in the McClelland Lake Wetland Complex. PHOTO: © C. WEARMOUTH