OIL SANDS RESEARCH AND INFORMATION NETWORK: CREATING AND SHARING KNOWLEDGE TO SUPPORT ENVIRONMENTAL MANAGEMENT OF THE MINEABLE OIL SANDS

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ABSTRACT

The Oil Sands Research and Information Network (OSRIN) is a university-based, independent organization that compiles, interprets and analyses available knowledge about managing the environmental impacts to landscapes and water impacted by oil sands mining and gets that knowledge into the hands of those who can use it to drive breakthrough improvements in regulations and practices. OSRIN is a project of the University of Alberta's School of Energy and the Environment (SEE) and was funded with grants from Alberta Environment and the Canada School of Energy and Environment Ltd. OSRIN's mandate is to create and share knowledge so that (1) Alberta can continue to improve environmental management of the mineable oil sands, and (2) Albertans and others are better informed about oil sands impacts, research and management. We do this by funding research and sharing knowledge through our website.

Keywords: Oil Sands, Environmental Management, Research.

INTRODUCTION

The Oil Sands Research and Information Network (OSRIN) is a university-based, independent organization that compiles, interprets and analyses available knowledge about managing the environmental impacts to landscapes and water impacted by oil sands mining and gets that knowledge into the hands of those who can use it to drive breakthrough improvements in regulations and practices. OSRIN is a project of the University of Alberta's School of Energy and the Environment (SEE). OSRIN was launched with a start-up grant of $4.5 million from Alberta Environment and a $250,000 grant from the Canada School of Energy and Environment Ltd.

OSRIN provides:

- Governments with the independent, objective, and credible information and analysis required to put appropriate regulatory and policy frameworks in place
- Media, opinion leaders and the general public with the facts about oil sands development, its environmental and social impacts, and landscape/water reclamation activities – so that public dialogue and policy is informed by solid evidence
- Industry with ready access to an integrated view of research that will help them make and execute environmental management plans – a view that crosses disciplines and organizational boundaries

OSRIN's mandate is to create and share knowledge so that: (1) Alberta can continue to improve environmental management of the mineable oil sands, and (2) Albertans and others are better informed about oil sands impacts, research and management. We do this by funding research and sharing knowledge through our website.

Funding

OSRIN was launched in 2009 with a start-up grant of $4.5 million from Alberta Environment and a $250,000 operating grant from the Canada School of Energy and Environment Ltd. Since then OSRIN has received a small amount of additional income such that the total budget available to pay for research and administration was slightly less than $4.8 million. We have spent $3.97 million to date.

Governance

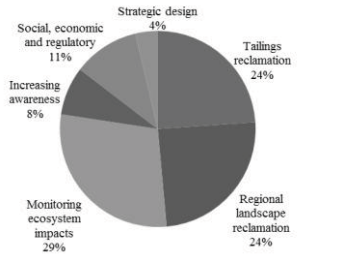
OSRIN has a 10-member Board of Directors comprised of seven provincial government representatives from key environmental, energy and research ministries or agencies and three academic research representatives. The Board provides advice and guidance on research program and project priorities and assists in disseminating OSRIN research results within their respective organizations.

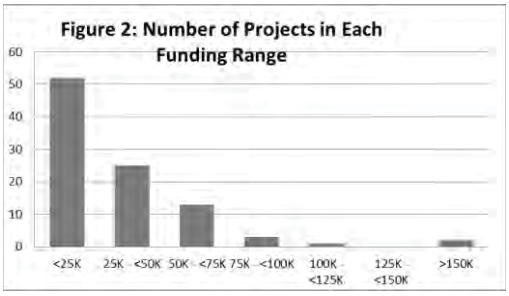
RESEARCH

OSRIN has identified six program areas in which we are funding work. Within each program area we fund projects to scope out the state of knowledge, identify knowledge gaps, and provide insights regarding research priorities.

The six research program areas are described below, with examples of some projects funded in each area. Not surprisingly the majority of funding to date has gone to tailings, reclamation and monitoring research (Figure 1).

Figure 1: Project Expenditures by Program





We tend to focus on small, short-duration projects costing less than $50K to allow us to undertake more research for the available funds (Figure 2). Generally the projects synthesize existing knowledge (e.g., literature reviews, technology catalogues) or bring experts together to discuss the state-of-knowledge (workshops). However OSRIN also funds early stage research that helps set the basis for longer-term, more expensive field and demonstration trials (usually new technologies, or new applications of existing technologies).

Tailings Reclamation

This program seeks to identify challenges that must be addressed in accelerating the reclamation of tailings ponds and tailings disposal areas and to catalyze necessary research, demonstration and development efforts to resolve them. Sample example projects include:

- A review of tailings dewatering technologies (note this was completed before the recent comprehensive tailings technology review by government and industry)
- A catalogue of analytical methods for naphthenic acid
- A review and assessment of emission measurement technologies for air pollutants from tailings ponds

Regional Landscape Reclamation

This program focuses on providing the knowledge necessary to support development of regional reclamation targets as well as site- and mine-level objectives. Some example projects include:

- Recommendations for planting trees on tailings dams in consideration of dam safety concerns
- An assessment of climate change impacts on revegetation success
- A workshop and a report on ecological resilience of reclaimed lands

Monitoring Ecosystem Impacts

This program focuses on components of a comprehensive, robust system in Alberta to monitor the effects of oil sands mining operations on ecosystem health – a system that is scientifically sound and has the confidence of the general public. Some example projects include:

- A paper and workshop outlining the characteristics of a world class environmental monitoring system for the oil sands (note that this was released before the provincial and federal government panel reports and monitoring system announcement)
- An assessment of isotope and geochemical tracers for fingerprinting tailings waters and the ability of the technique to determine occurrence of tailings water in the Athabasca River
- An evaluation of the use of wildlife as biomonitors of ecosystem health

Increasing Awareness

This program aims to increase awareness of OSRIN and oil sands issues through an active website presence, sponsoring oil sands related conferences, digitizing historical information and publication of OSRIN research results. Some example projects include:

- A review of the information sources journalists use to develop oil sands stories
- Three years co-sponsoring the iGEM (International Genetically Engineered Machines) Oil Sands Challenge with the Oil Sands Leadership Initiative
- A report and workshop exploring the potential for a reclamation knowledge network

Social, Economic and Regulatory

This program seeks to identify social, economic and regulatory issues that may affect environmental management of oil sands and to evaluate the effectiveness of environmental management in addressing social, economic and regulatory issues. Some example projects include:

- Three reports assessing different facets of the province's Mine Financial Security Program
- A review of federal legislation applicable to oil sands

- A plain language summary of human health risk assessment (HHRA) and a report on the role of naphthenic acids in HHRAs

Strategic Design

This program focuses on the development and refinement of OSRIN's strategic intent and program delivery. Most of the work in this program was undertaken in the first year. A key project in this program was development of a detailed research strategy roadmap, logic model, and a description of OSRIN's goals, mandate and approach.

INFORMATION

OSRIN creates and shares information in a variety of ways including: our website, our research reports, our bibliography, digitizing historical research, and networking. As noted above under the Increasing Awareness program we also support oil sands related conferences to ensure people have access to technical and policy information.

Website

OSRIN's website (http://www.osrin.ualberta.ca/en.aspx) is our primary method for disseminating information and is your gateway to the world of oil sands information. The website contains:

- What's New – current events updated daily
- Did You Know – interesting tidbits to whet your appetite
- Publications – links to OSRIN's publications
- Newsletter – 180 subscribers to a bi-weekly e-mailed updates on website content and OSRIN activities
- Website Links – links to an array of information sources
- Videos – see and hear a variety of opinions; an excellent teaching tool
- Upcoming events – conferences, workshops etc. relevant to oil sands
- Who's who – a listing of people involved in oil sands work

Research Reports

OSRIN has released 38 technical research reports to date as well as 9 staff reports. OSRIN has also released a video (both full length and sub-divided into blocks for easy mobile device access). As of July 5, 2013 there have been over 22,000 copies of OSRIN products downloaded. A full listing of products is available at http://www.osrin.ualberta.ca/en/OSRINPublications.aspx and all of the reports are accessible on the University of Alberta's Education & Research Archive site at http://hdl.handle.net/10402/era.17209.

Oil Sands Environmental Management Bibliography

OSRIN has partnered with the Cumulative Environmental Management Association (CEMA) to develop an on-line, searchable bibliography for oil sands related information (http://osemb.cemaonline.ca/rrdcSearch.aspx). With over 2,700 references from academia, government, industry and other organizations spanning the years 1914 to 2014 the bibliography is the best place to start your oil sands research (Figure 3).

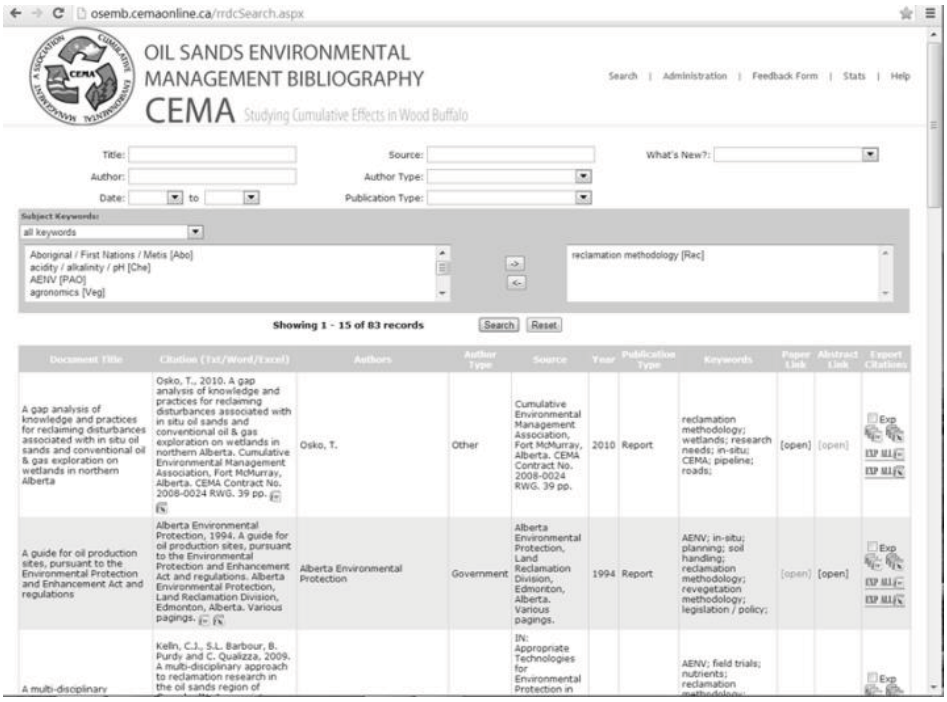


Figure 3. Oil Sands Environmental Management Bibliography

Digitizing Historical Reports

OSRIN has digitized 320 government research and policy documents from the 1970s and 1980s to ensure this valuable content is not lost to those who look primarily to the internet for information. Further information on the types of documents available as well as links to full listings of available reports and the sites where the individual reports can be downloaded are provided at http://www.osrin.ualberta.ca/Resources/DigitizedReports.aspx.

Networking

OSRIN provides a key link between researchers, ENGOs, the general public and government and has responded to numerous requests for information and contacts. The Executive Director's membership in CEMA's Reclamation Working Group and Land Working Group, plus contacts in government, academia and industry, provide opportunities to make people aware of activities that others are undertaking that may have an impact on their own work. The Executive Director is also active in making presentations in a variety of forums to explain OSRIN's work and promote recognition of the extensive body of information that has been generated about environmental management of the oil sands (see http://www.osrin.ualberta.ca/AboutOSRIN/News%20and%20Activities.aspx).

Overcoming Northern Challenges

Proceedings of the 2013 Northern Latitudes Mining Reclamation Workshop and

38th Annual Meeting of the Canadian Land Reclamation Association

Whitehorse, Yukon September 9 – 12, 2013

CLRA | ACRSD
Canadian Land Reclamation Association
Association canadienne de réhabilitation des sites dégradés

Northern Latitudes Mining Reclamation Workshop

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Stewart, Karpenin, and Siciliano	Northern Biochar for Northern Remediation and Restoration
Petelina	Biochar application for revegetation purposes in Northern Saskatchewan
Chang	Bioremediation in Northern Climates
Geddes	Management of Canada's Radium and Uranium Mining Legacies on the Historic Northern Transportation Route
Hewitt, McPherson and Tokarek	Bioengineering Techniques for Re-vegetation of Riparian Areas at Colomac Mine, Northwest Territories
Bossy, Kwong, Beauchemin, Thibault	Potential As2Oc Dust conversion at Giant Mine (paper not included)
Waddell, Spiller and Davison,	The use of ChemOx to overcome the challenges of PHC contaminated soil and groundwater at contaminated sites
Douheret,	Physico-Chemical treatment with Geotube® filtration: Underground Mine Desludging in winter TTS, Iron (Fe) and Zinc treatment
Coulombe, Cote, Paridis, Straub	Field Assessment of Sulphide Oxidation Rate - Raglan Mine
Smirnova et al	Results of vegetation survey as a part of neutralizing lime sludge valorization assessment
Baker, Humbert, Boyd	Dominion Gurney Minesite Rehabilatation (paper not included)
Martínez, Borstad, Brown, Ersahin, Henley	Remote sensing in reclamation monitoring: What can it do for you?

Wednesday:	**Back To Tuesday**
Eary, Russell, Johnson, Davidson and Harrington	Water Quality Modelling and Development of Receiving Environment Water Quality Objectives for the Closure Planning in the Keno Hill Silver District (paper not attached)
Knight	Galena Hill, Yukon, Ecosystem Mapping Project
Polster	Natural Processes: An Effective Model For Mine Reclamation
Dustin	Implementation of contaminated water management system upgrades to allow for dewatering of two open pits at the Vangorda Plateau, Faro Mine Complex, Yukon
Kempenaar, Marques and McClure	Tools for Arctic Revegetation: What's in Your Toolbox?
Smreciu, Gould, and Wood	Establishment of Native Boearl Plant Species On Reclaimed Oil Sands Mining Disturbances
Keefer	Twin Sisters Native Plant Nursery
Pedlar-Hobbs, Ludgate and Luchinski	Key Factors in Developing and Implementing a Successful Reclamation Plan
Chang, et.al	Effects of Soil Aggregates Sizes (paper not attached)
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NORTHERN LATITUDES MINING RECLAMATION WORKSHOP

The Northern Latitudes Mining Reclamation Workshop is an international workshop on mining, land and urban reclamation and restoration methods. The objective of the workshop is to share information and experiences among governments, industry, consultants, Alaska Natives, northern First Nations and Inuit groups which undertake reclamation and restoration projects, or are involved in land management in the north or in comparable environments.

The first Workshop was held in Whitehorse, Yukon Territory, Canada in 2001 and it has been held every two years since, alternating between Canada and Alaska. The primary sponsors of the Workshop include the Yukon Geological Survey, Indian and Northern Affairs Canada, Natural Resources Canada, US Department of the Interior Bureau of Land Management, and the State of Alaska Department of Natural Resources.

CANADIAN LAND RECLAMATION ASSOCIATION

The CLRA/ACRSD is a non-profit organization incorporated in Canada with corresponding members throughout North America and other countries. The main objectives of CLRA/ACRSD are:

- To further knowledge and encourage investigation of problems and solutions in land reclamation.
- To provide opportunities for those interested in and concerned with land reclamation to meet and exchange information, ideas and experience.
- To incorporate the advances from research and practical experience into land reclamation planning and practice.
- To collect information relating to land reclamation and publish periodicals, books and leaflets which the Association may think desirable.
- To encourage education in the field of land reclamation.
- To provide awards for noteworthy achievements in the field of land reclamation.

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- The Conference Organizing Committee: Alissa Sampson, Andrea Granger, Bill Price, David Polster, Diane Lister, Justin Ireys, Linda Jones, Mike Muller, Neil Salvin and Samantha Hudson.
- The Conference Papers and Posters Committee: Andy Etmanski, Bill Price, Chris Powter, David Polster, Diane Lister and Scott Davidson
- The Conference Sponsors (see next page)
- The Conference paper and poster presenters
- Dustin Rainey, Jocelyn Douheret and Brian Geddes for permission to use their photos on the Cover, Papers and Posters pages, respectively

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