



a place of mind  
THE UNIVERSITY OF BRITISH COLUMBIA

2013-2014

# BRAES ANNUAL REPORT

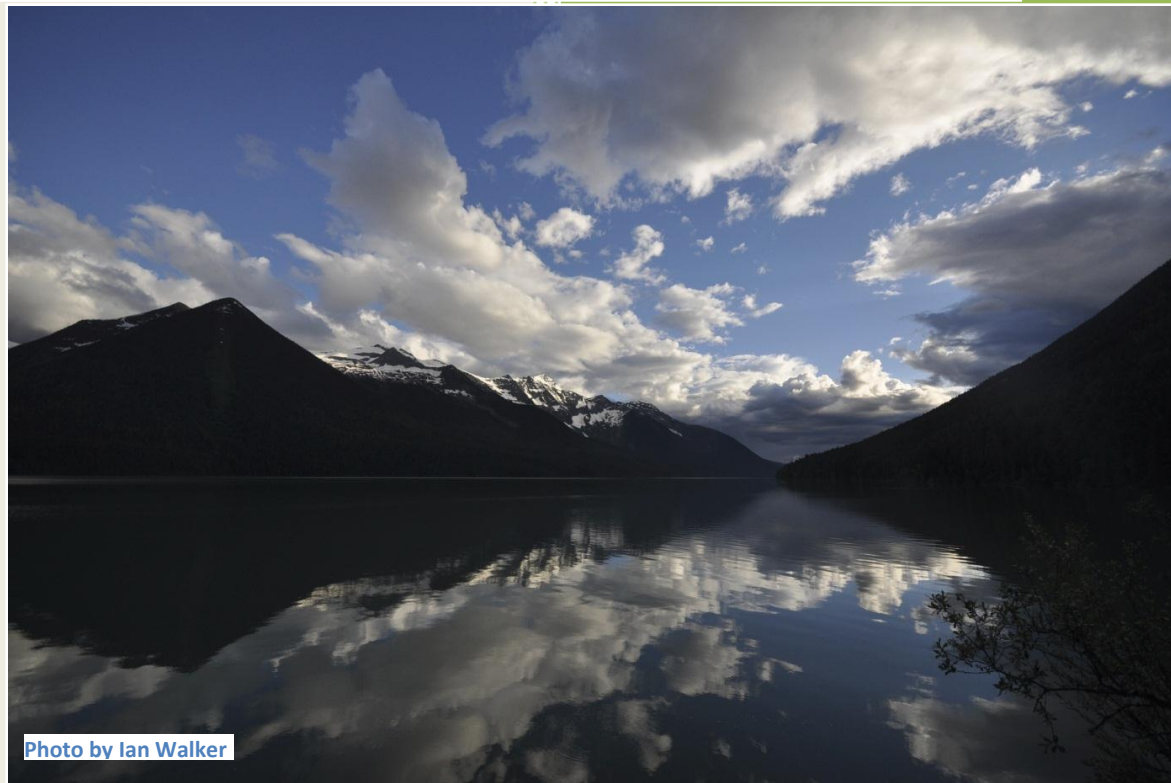


Photo by Ian Walker

The Okanagan Institute for  
Biodiversity, Resilience, and  
Ecosystem Services (formerly  
SARAHs)

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# BRAES at a Glance



- ✓ 22 faculty members
- ✓ Over 65 student and postdoctoral trainees
- ✓ Over 6000 sq. ft. of dedicated research laboratory space
- ✓ Numerous affiliated laboratories
- ✓ \$2.8 million in research funding in 2013-2014
- ✓ Over 80 scientific publications in 2013-2014
- ✓ Partnerships with more than 50 non-academic organisations



Photos by Ian Walker

## 1. Message from the Director

The former Institute for Species at Risk and Habitat Studies (SARAHS) has turned a new page: In March 2014 SARAHS adopted a new name – The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) – to better reflect the scope and breadth of our research expertise and activities. With this name change, we have gone through a period of redefining the institute's directions and developing new initiatives. Over the past year, we have substantially increased the visibility of the institute through the creation of a new website, the establishment of new partnerships, and through communication and outreach with our non-academic partners. We have begun new activities, notably the "Partners in the Classroom" series, which has brought non-academic speakers to the classroom to discuss how they apply science to the practical world of management and policy. We have also hired a part-time institute coordinator, Carolina Restrepo, who has been instrumental in organising and coordinating all of the institute's activities and operations.

With over 80 scientific publications and about 2.8 million dollars in research funding over the past year, BRAES members have excelled in carrying out high impact fundamental and applied research, positioning us on campus as a centre of excellence for research in ecology, natural resource management, and the environment. We also play a leading role in creating an enriched training environment for graduate students on campus, through collaborative supervision, scientific animation, and facilitating networking opportunities for our students.

I look forward to a busy and dynamic 2014-15 academic year, starting in September 2014 with a Water and Biodiversity Research Forum co-hosted in collaboration with the Okanagan Basin Water Board. We will also pursue our numerous on-going activities and continue to carry out regionally and globally relevant research.

***Lael Parrott***

BRAES Director



## 2. BRAES Strategic Directions



Photo by Ian Walker

## 2.1 Vision

To advance efforts to protect species and ecosystems through interdisciplinary research, training and community engagement.

## 2.2 Mission

To conduct fundamental and applied research in biodiversity and conservation that has regional and international impact.

To become a leading international centre for the training of highly qualified undergraduate, graduate and postgraduate personnel. These researchers will be uniquely positioned to bridge disciplinary barriers to inform and guide effective conservation research and management strategies.

To foster strategic partnerships with First Nations, government, industry, and non-governmental organizations and to maintain active engagement with community stakeholders through educational outreach and stewardship activities.

## 2.3 Strategic Directions

- Provide Enriched Undergraduate, Graduate and Postdoctoral Training Opportunities
- Secure Funding for Infrastructure, Training, and Research
- Build Partnerships
- Translate Research into Action
- Enhance our Existing Profile and Increase our Visibility

## 2.4 Links with UBCO Research and Strategic Plans

The BRAES mission and vision are closely aligned with the UBC Okanagan Strategic Research Plan. The UBCO Strategic Research Plan emphasizes the importance of interdisciplinarity, partnerships and excellence in research, all demonstrated strengths of BRAES. “Sustainable Environments and Populations” is noted as one of six Areas of Research Priority, specifically naming BRAES as an established entity of multidisciplinary strength to lead “research on environmental quality, adaptive responses and sustainable development (to) inform management and policy decisions that contribute to healthy environments for people and other organisms.”

BRAES mission is also contributing to the UBC Strategic plan commitment of Research Excellence specifically with its goal of increasing the quality and impact of UBC's research and scholarship, participating in actions such as:

- Supporting and enhancing UBC researchers' grant funding competitiveness and success.
- Enhancing infrastructure to support leading edge research.
- Fostering UBC's globally influential areas of research excellence.



### 3. BRAES Operations

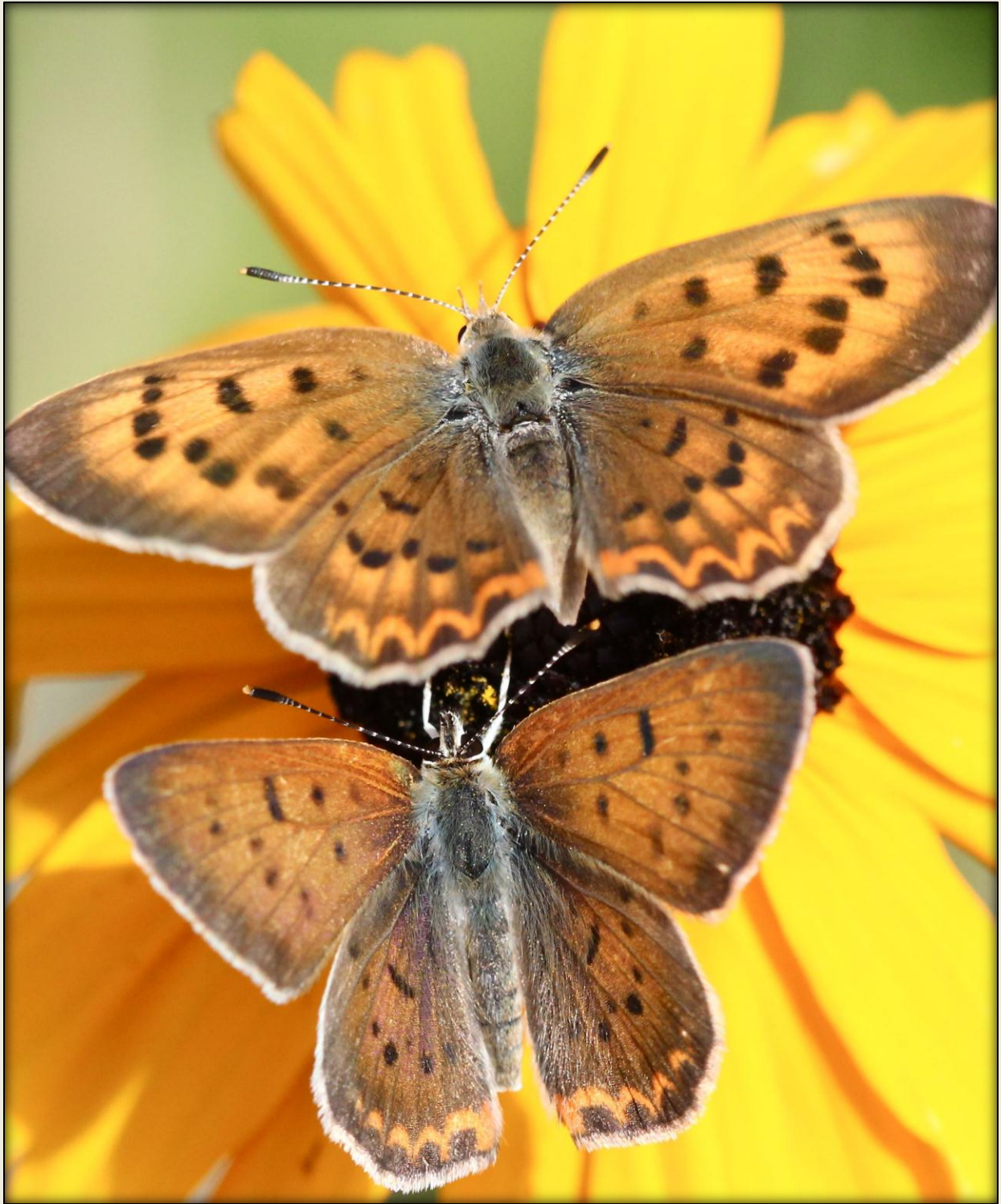


Photo by Bob Lalonde



### 3.1 Governance

#### Steering Committee Members:

Dr. Lael Parrott        Institute Director

Dr. Sylvie Desjardins

Dr. Melanie Jones

Dr. Bob Lalonde

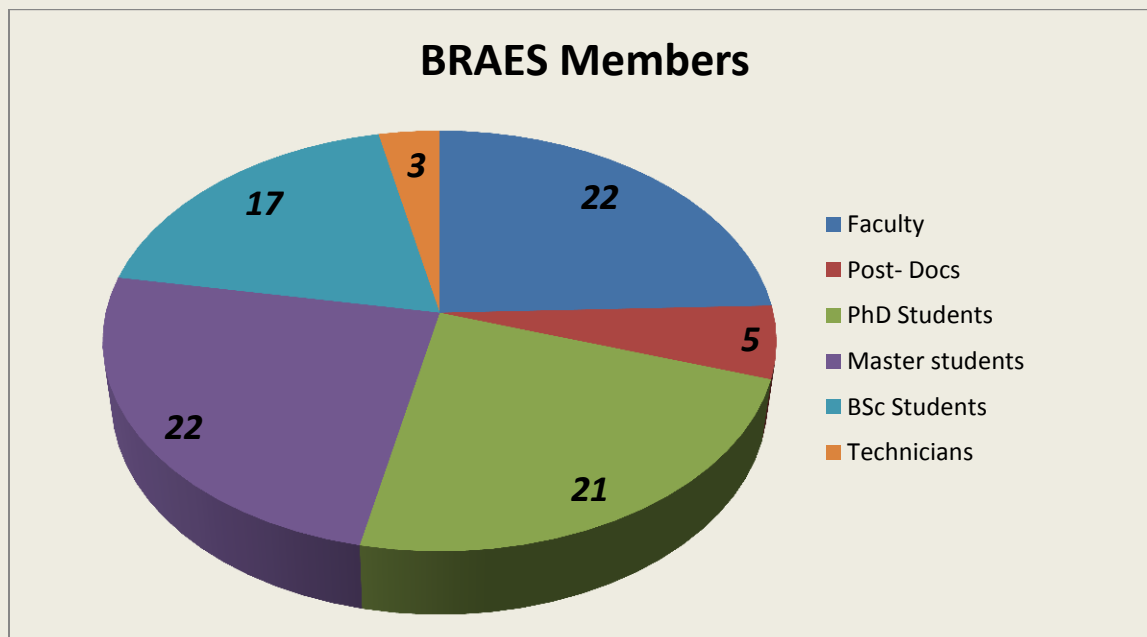
Graduate Student (to be elected)

#### Institute Coordinator

Carolina Restrepo

### 3.2 Membership

As of March 2014 BRAES has 90 members distributed as follows: 22 Faculty Members, 5 Post-Doctoral Researchers, 21 PhD Students, 22 Masters Students, 17 Undergraduate Students and 3 Technicians.



For a detailed list of faculty members please consult Appendix 1

### 3.3 Partnerships

BRAES values partnerships within the University and with government, non-government, community, and international organizations. Partnerships include activities such as joint research, funding agreements, student supervision, dissemination or application of research.

Below, we show a few of the groups with whom we have established collaborations:

#### **Within The University of British Columbia:**

- Okanagan Sustainability Institute (Okanagan)
- BC Regional Innovation Chair in Water Resources and Ecosystem Sustainability (Okanagan)
- Watershed Science Research Group (Okanagan)
- Beatty Biodiversity Research Centre (Vancouver)
- Centre for Applied Conservation Biology (Vancouver)

#### **Canadian governmental agencies:**

- Environment Canada
- Canadian Wildlife Service
- Parks Canada
- Agriculture Canada
- BC Ministry of Forest, Lands and Natural Resources Operations
- BC Parks
- Canadian Food Inspection Agency
- Department of Defense
- City of Armstrong
- Natural Resources Canada
- Regional District of Central Okanagan
- City of Kelowna
- District of Lake Country
- Okanagan Basin Water Board
- BC Ministry of Agriculture
- Canadian Department of Fisheries and Oceans

#### **International governmental agencies**

- US National Park Service
- US National Forest Service
- Montana Fish, Wildlife and Parks
- US Department of Agriculture
- L'Institut National de la Recherche Agronomique (France)

**Non-governmental entities:**

- Island Conservation
- Conservation Northwest
- Okanagan Collaborative Conservation Program (OCCP)
- South Okanagan Similkameen Conservation Program (SOSCP)
- Wildlife Conservation Society
- American Museum of Natural History
- Water Stewardship Council
- Nature Trust of BC
- Get to Know FORREX
- Great Northern Landscape Conservation Cooperative

**Industrial partners:**

- Tolko
- Tree Fruit Growers Association Dobson Engineering Ltd.
- Ecoscape Environmental Consultants Ltd.

### 3.4 Space and existing resources

A CFI grant was secured in 2004. This helped support the construction of the 3rd floor of the Science Building, including about 6000 square feet of BRAES laboratory facilities that are equipped with state-of-the-art instrumentation. More specifically, the facilities include:

- Molecular Lab
- PCR Product Room
- DNA Sequencing Room
- Prep Room
- Clean Cold Room
- Dirty Cold Room
- Equipment Room
- Dirty Ecology Lab
- Microscope Room
- Culture Room
- Computing/GIS Room
- Physiology Lab
- Radiation Lab

These facilities are being used by BRAES members to conduct their research and to accomplish the BRAES mission. BRAES members have been very productive in 2013-2014 with about 85 publications and over \$2.8 million in grant funding (see below for details). This level of productivity would not be possible without the facilities.

### 3.5 Staff and Administration

The institute has a director who is appointed by the VP Research. Dr. Lael Parrott is the current director. Her appointment began on August 29<sup>th</sup> 2013 and is for 3 years.

On December 2013 BRAES hired a part-time coordinator who is responsible for planning, coordination, and communication within the BRAES Institute by:

- Organizing BRAES conferences, workshops, training sessions, retreats and annual general meetings.
- Preparing the Institute's annual activity reports
- Preparing budgets and forecasting requirements
- Developing an annual budget
- Facilitating collaborative agreements involving researchers, granting agencies and departments within the institute
- Promoting BRAES research to the broader community, in collaboration with university media relations officers
- Securing industry and other partners of BRAES for long-term collaborations
- Writing grants for BRAES and working with the Development Office to secure external funding for BRAES
- Developing and maintaining the BRAES web site
- Coordinating and preparing a quarterly BRAES newsletter.



#### 4. BRAES Activities



Photo by Ian Walker

## 4.1. Speaker Series

### 4.1.1. BRAES partners in the classroom speaker series:

This speaker series brings BRAES' non-academic partners to campus to speak about the work they do and the challenges and issues they face in their professions. The talks are held during scheduled undergraduate class times so that our undergraduate students have the opportunity to interact with scientists and practitioners working in non-academic environments. All BRAES members and the general public are also invited to attend. An informal networking session follows each talk to facilitate discussion and interaction with the speaker.

#### **Fall 2013 BRAES in the Classroom Speaker Series:**

October 18<sup>th</sup> 2013: “Environmental sustainability: Does local government planning make a difference?”

Speaker: Margaret Bakelaar, Environmental Planner at the Regional District of the Central Okanagan.

Host Professor: Dr. Lael Parrott

Attendance: 40

#### **Winter 2014 BRAES in the Classroom Speaker Series:**

March 5<sup>th</sup> 2014: “Using GIS for agricultural and environmental modelling”

Speaker: Dr. Denise Neilsen, Agriculture Canada

Host Professor: Dr. Jason Pither

Attendance: 40

March 13<sup>th</sup> 2014: “Mirror mirror on the wall, who’s responsible for it all? Habitat protection for species at risk in Canada”

Speaker: Lucy Reiss, Environment Canada Specialist

Host Professor: Dr. Ian Walker

Attendance: 25

March 25<sup>th</sup> 2014: “Changing forests and water – from snow to streams”

Speaker: Dr. Rita Winkler, Ministry of Forests, Lands and Natural Resources Operations

Host Professor: Dr. Adam Wei

Attendance: 48

4.1.2. Distinguished Guest Speakers: Through this speaker series, BRAES will host 2-3 distinguished scientists per year to speak on environmental topics of broad interest. The talks will be open to the general public. This speaker series will debut in summer 2014.

## 4.2. Research activities

### 4.2.1. Context:

BRAES research has focused on identifying and managing species and habitats at risk, understanding and predicting biotic responses to environmental change, and sustaining resources and ecosystem services in natural and managed landscapes.

Our underlying motivation is to increase scientific understanding of ecological systems and to inform management and planning decisions that promote the preservation of biodiversity and ecosystem services in terrestrial, marine and aquatic systems.

BRAES members work from the genetic to landscape scales and use a wide range of field, laboratory and quantitative methods. BRAES facilitates multidisciplinary collaboration, leading to innovative research that transcends traditional approaches to ecology and conservation.

### 4.2.2. Research Themes:

BRAES research falls under six inter-related themes that were revised and updated at a members' meeting held in December 2013



## **Biodiversity and Ecological Interactions**

This theme involves the study of the inter-relationships between biodiversity and ecosystem processes, from genetic to ecosystem and landscape scales. SARAHS researchers working under this theme study diverse questions related to community assembly, invasive species, population dynamics and ecological connectivity, for example. A strong emphasis within this theme is on soil microbiology: understanding the contribution of mycorrhizal fungi and other micro-organisms to soil fertility and nutrient cycling in natural and agro-ecosystems. The fundamental work carried out under this theme provides the scientific foundation for conservation, restoration, and management efforts and for understanding relationships between biodiversity and ecosystem services provisioning.

## **Conservation Biology**

Conservation biology focuses on the identification and description of habitats necessary to support species at risk, and the development of scientific tools to support the conservation of these habitats. BRAES researchers use a range of tools to examine how species may respond to changing environments, habitat loss, and modified landscapes. The results of this research are applied to address the effectiveness of conservation laws and policies and to inform decision-makers on how best to conserve biodiversity in terrestrial, marine and freshwater ecosystems.

## **Landscape and Natural Resource Management**

Research under this theme integrates ecology with human impacts on the landscape, searching for the most environmentally sustainable methods to use our natural resources. Projects include studying the impacts of forestry on forest hydrology and biodiversity, ecological restoration following human disturbances, modeling the impacts of land use change on key ecosystem services, advanced agro technology, and land use planning to sustain biodiversity.

## **Water Conservation & Quality**

Water provisioning is a key ecosystem service on which humans depend and which is critical to supporting all terrestrial life-forms. Research in this area focuses on sustaining this ecosystem service by enhancing the quality of the terrestrial and aquatic environments that filter and modulate fresh water supplies. Projects include studies of ecotoxicology in aquatic ecosystems, water quality monitoring, and relationships between land use and water quality and availability.



## **Computational Ecology**

Research in computational ecology combines quantitative methods with data to model and describe population and community dynamics in time and space. Methods range from statistical modeling of diversity and heterogeneity to the development of dynamic models using analytical or simulation-based approaches. These tools can be used to predict the effect of natural or human-caused disturbances on species and ecosystems or to predict the spatial spread of an invasive species across a landscape, for example. This theme reflects the strong links in BRAES between the mathematical and ecological sciences, leading to development of innovative methods in environmental modelling and data analysis.

## **Social-Ecological Systems**

This theme lies at the interface between the environment and society. The study of social-ecological systems relates to how humans shape and are reshaped by their natural environments, and includes the study of cultural perceptions of the environment. Research under this theme explores the nature of social-ecological resilience, adaptation of human communities to environmental change, and how cultural representations of nature influence human behaviour.

#### 4.2.3 Record of Publications, students and research funding:



### 4.3 Outreach

The Institute has a brand new website that is being updated every day with the new information and activities of the institute. The new website can be found here: <http://BRAES.ok.ubc.ca/>

#### Outreach Activities:

- BRAES co-sponsored, and various BRAES members hosted and organized, the 8th annual meeting of the Canadian Society for Ecology and Evolution, May 12-15, 2013, at UBCO. With 430 attendees from around the world, this was by far the largest and most successful academic conference to be hosted at UBCO. It included a symposium on

policy in biodiversity conservation, with participation by journalists, members of parliament, etc.

- BRAES members were involved in other different activities such as conference presentations, invited talks, meetings and workshops, media interviews and publications among others:
  - More than 40 Conference presentations as speaker or keynote speakers
  - 20 Invited talks and/or meetings
  - 13 Media interviews and newspaper articles
  - 10 Community presentations
- Upcoming events: BRAES will sponsoring or co-sponsoring the following events:
  - Water & Biodiversity Forum: Rotary Centre for the Arts, Kelowna Sept 16 and 17 2014
  - IGS 2014 Conference, Kelowna May 2 and 3 2014

## 5. BRAES Goals and Challenges for 2014-2015



### GOALS & CHALLENGES:

- Contribute to developing a thriving research culture on campus
- Continue to provide an enriched graduate training environment by increasing graduate student participation in BRAES (e.g., seminars, social activities, leading workshops, etc.)
- Increase the diversity of our membership
- Foster new interdisciplinary collaborations within the institute
- Increase the Institute's national and international visibility
- Secure operational funding
- Continue to pursue high impact, regionally and globally relevant research



## Appendix 1: BRAES Faculty members

- 1) Sylvie Desjardins, Arts and Sciences
- 2) Daniel Durall, Arts and Sciences
- 3) Miranda Hart, Arts and Sciences
- 4) Karen Hodges, Arts and Sciences
- 5) Nancy Holmes, Creative and Critical Studies
- 6) John Janmaat, Arts and Sciences
- 7) Melanie Jones, Arts and Sciences
- 8) Sylvia Esterby, Arts and Sciences
- 9) John Klironomos, Arts and Sciences
- 10) Robert Lalonde, Arts and Sciences
- 11) Karl Larsen, Thompson Rivers University
- 12) Bruce Mathieson, Arts and Sciences
- 13) Susan Murch, Arts and Sciences
- 14) Lael Parrott, Arts and Sciences
- 15) Michael Pidwirny, Arts and Sciences
- 16) Jason Pither, Arts and Sciences
- 17) Scott Reid, Arts and Sciences
- 18) Mark Rheault, Arts and Sciences
- 19) Michael Russello, Arts and Sciences
- 20) Rebecca Tyson, Arts and Sciences
- 21) Ian Walker, Arts and Sciences
- 22) Adam Wei, Arts and Sciences