

2019/2020
APRIL MARCH

ANNUAL REPORT

BRAES

Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services

braes.ok.ubc.ca



THE UNIVERSITY OF BRITISH COLUMBIA

BRAES as a place of:

RESEARCH

BRAES is committed to producing world-class research that will distinguish UBC Okanagan as a place of excellence in the fields of biodiversity and environmental sustainability. We are continually striving to enhance our research capacity and impact, locally and globally. In so doing, we increase our ability to train, nurture and empower the next generation of leaders.

LEARNING

BRAES is a place of lifelong learning, creating opportunities for institute members and the broader community to engage in knowledge sharing activities. In addition, through its dedicated research facilities and organization of scientific activities, BRAES provides an enhanced training environment for undergraduate and graduate students.

ENGAGEMENT

BRAES values community engagement and non-academic partnerships as a means of leveraging the relevance and impact of our work. BRAES members have on-going collaborations with more than 50 government, non-government, community, and international organizations.

INTERNATIONALISM

BRAES aims to be a portal for global engagement, connecting our campus community to the world. Our members currently carry out research on seven continents, with active projects in places such as the Great Barrier Reef, the Galapagos Islands, the Nepalese Himalayas and the South African Succulent Karoo.

INNOVATION

Today's environmental challenges are wicked problems, for which no clear solution exists. By facilitating interdisciplinary collaboration, BRAES creates a place for ideas to incubate, leading to innovative outcomes that respond to the needs and imperatives of today's society.

BRAES

at a Glance

2019-2020



32 faculty members

Over 150 student and postdoctoral trainees

6000 sq. ft. of dedicated research laboratory space


Numerous affiliated laboratories

\$3.5 million in research funding in 2019-2020

Of which \$2.9 million are directly managed by UBC

80 scientific publications in 2019-2020

Partnerships with more than 55 non-academic organisations



BRAES Highlights

2019-2020

I. Walker

More than 20 MSc, MFA and PhD Graduates

More than 90 events including: research forums, research seminars, invited guest speakers, workshops, research group meetings and social events

Co-hosting conferences and events with partner organizations

1800 attendees to BRAES events from the campus community and the general public

Web-streaming from UBC Vancouver of the **Biodiversity Seminar Series** organized by the Biodiversity Research Centre.

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BRAES Objectives and Directions 2019-2020



- Continuing to provide an enriched graduate training environment
- Support for the activities of new Eminence funded research clusters in areas of strategic importance for BRAES
- Seeking new sources of funding for BRAES operations and laboratory space upgrades
- Increase the Institute's national and international visibility through improved communication materials (*website, brochure, newsletters & research profiles*)
- Continued high impact, regionally and globally relevant research

1. BRAES STRATEGIC DIRECTIONS



1.1 Vision

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

1.2 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.

1.3 Links with UBCO Research and Strategic Plans

The Aspire consultation process resulted in a vision of the Okanagan campus a “model of innovative and interdisciplinary programming within the UBC system, and a place that has an impact on communities both local and global” (Aspire consultation report). The BRAES Institute contributes directly to achieving this goal, by bringing together interdisciplinary groups of researchers from the sciences, fine arts, humanities and social sciences, to tackle issues of both regional and global importance. In addition to our strong contributions to academic inquiry, our members work in close collaboration with our many community partners to ensure that research results are translated into policy and practice. Through its extensive network, BRAES helps to facilitate and foster these connections.

In alignment with UBC’s 2018 Indigenous Strategic Plan, BRAES members are also engaging in research with indigenous partners via two Eminence funded projects as well as others in ecology, environmental science, and fine arts. These projects provide opportunities for knowledge sharing and relationship building, as well as increased training opportunities for indigenous students.

The BRAES Institute’s commitment to indigenous engagement and collaborative, interdisciplinary research is well aligned with the priorities of UBC’s Strategic Plan. Through our seminars and networking activities, we foster inclusiveness and interdisciplinary collaboration on the Okanagan Campus. Research within BRAES supports UBC’s mission of engaging communities while having

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.

2. BRAES OPERATIONS



2.1 Governance

The VP Research at UBC Okanagan appoints the Institute Director who is a tenured Associate Professor or higher rank and who is presently a UBC Okanagan faculty member. The BRAES director reports to the VP Research.

The Director is responsible for coordinating the operations of BRAES, including its administrative staff and budget. The Institute has a Steering Committee that consists of the Director (Chair), the Deans of the Irving K. Barber School of Arts and Sciences (IKBSAS) and the Faculty of Creative and Critical Studies (FCCS), 3 or 4 faculty Institute members and 1 Graduate student member. Faculty steering committee members are elected by the membership for a 3 year period. The graduate student member is elected by other student members of BRAES for a 1 year term.

The Director supervises the Coordinator who is responsible for the day-to-day Institute activities and for planning, coordination, and communication within the Institute.

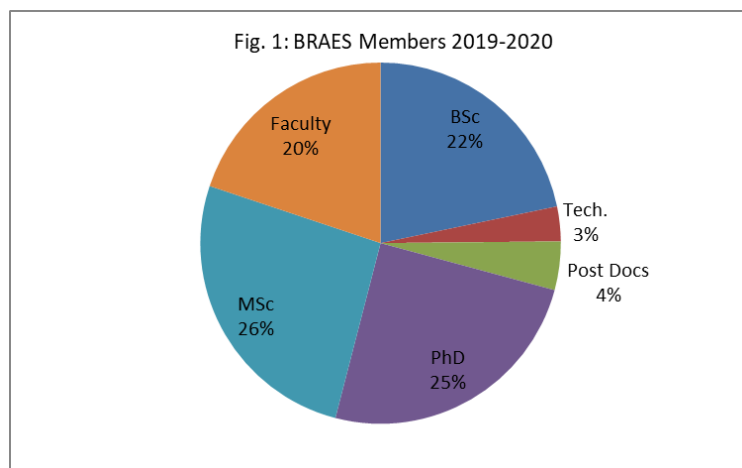
A new steering committee members was selected at the end of 2019, here is the new composition:

- Dr. Lael Parrott, Institute Director
- Dr. John Klironomos, Dean's delegate, IKBSAS.

- Dr. Greg Garrard, Dean's delegate, FCCS.
- Dr. Melanie Jones
- Dr. Adam Ford
- Dr. Rebecca Tyson
- Dr. Jason Pither
- Corrina Thomsen, Graduate Student
- Carolina Restrepo-Tamayo, Institute Coordinator

2.2 Membership

As of March 2020 BRAES has about 161 members distributed as follows: 32 Faculty Members, 7 Post-Doctoral Researchers, 40 PhD Students, 42 Masters Students, 35 Undergraduate Students and 5 Technicians (see Figure 1).



For a detailed list of faculty members please consult Appendix 1.

2.3 Staff and Administration

The institute has a director who is appointed by the VP Research. Dr. Lael Parrott is the current director.

BRAES has 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
- 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
- Developing an annual budget in collaboration with the institute director

2.4 Impact of Covid-19 on BRAES events and operations

BRAES has adapted in the best possible way to all the challenges Covid –19 has imposed in itsr operations. UBCO and the VP Research have provided great support and also guidelines to manage the situation. As of today:

- BRAES staff is working remotely
- All BRAES events, seminars and guest speakers talks are now virtual.
- Some events have been postponed, one of them is the Okanagan Research Forum that is hosted by BRAES and ICER every two years.
- BRAES labs are operating , following specific protocols defined by UBCO for lab work.

3. BRAES RESEARCH



3.1 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.

3.2 Research Themes

BRAES research falls under six inter-related themes (Figure 2).



FIGURE 2: BRAES RESEARCH THEMES

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

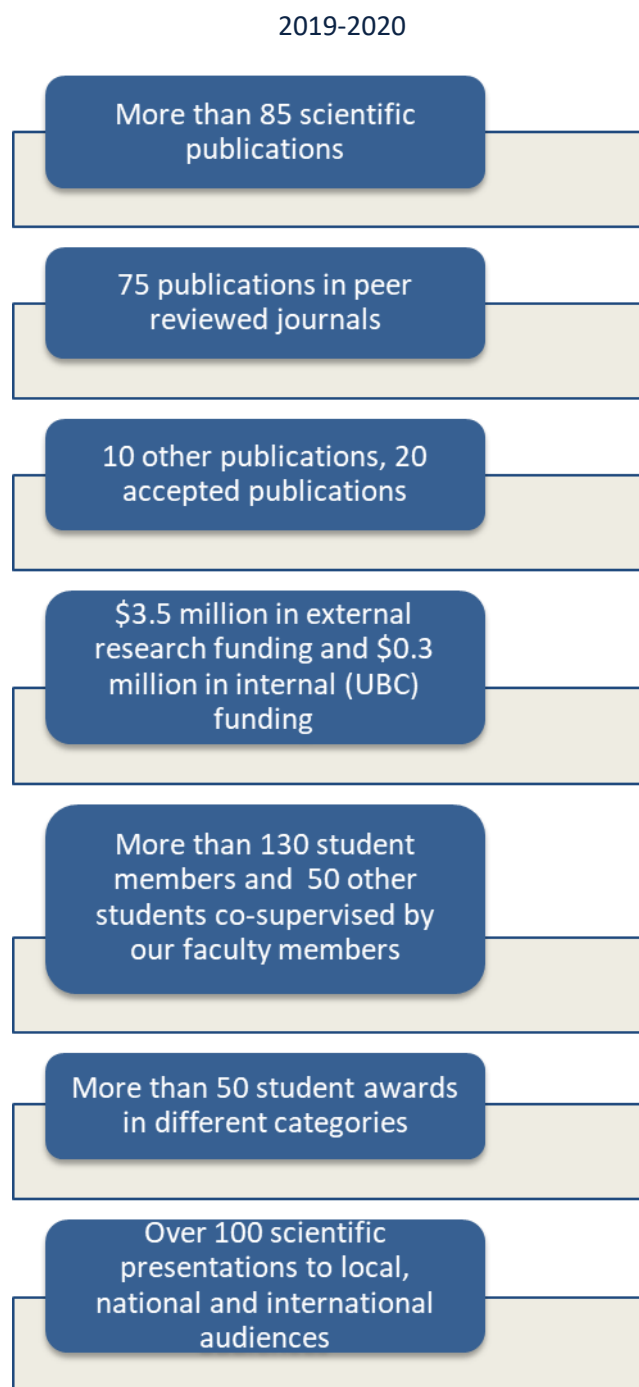
This theme lies at the interface between the environment and society. The study of social-ecological systems relates to how humans shape and are reshaped by their natural environments, and includes the study of cultural perceptions of the environment. Research under this theme explores the nature of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

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. BRAES 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 ecosystems services provisioning.

3.3 Record of Publications, Students and Research Funding 2017-2018:

FIGURE 3: BRAES RESEARCH RECORDS



See Appendix 2 for a selected list of publications

Sources of external funding:

For a selected list of our members projects please go to appendix 4

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, and the 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 2017-2018 with about 150 publications and over \$3.0 million in grant funding. This level of productivity would not be possible without the facilities.

3.5 Partnerships

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

Below, we list a few of the groups with whom we

have established collaborations:

Within The University of British Columbia:

- Institute for Community Engaged Research—ICER (Okanagan)
- BC Regional Innovation Chair in Water Resources and Ecosystem Sustainability (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)

Not for profit organizations:

- Island Conservation
- Okanagan Basin Water Board (OBWB)
- BC Wildlife Federation
- 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
- Great Northern Landscape Conservation Cooperative
- British Columbia Institute of Agrology Okanagan Chapter

Private sector:

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

3.6 Interdisciplinary Research

BRAES researchers work in a range of environments and locations around the globe. They maintain active affiliations with many partner organizations, including government ministries and NGOs. BRAES is committed to promoting research partnerships and carrying out interdisciplinary research that will directly inform environmental policy and management decisions.

Affiliated research groups and laboratories:

- Biodiversity and Landscape Ecology Research Facility
- Complex Environmental Systems Laboratory
- The Ecological and Conservation Genomics Lab
- Fragment Analysis and DNA Sequencing Services (FADSS)
- Forest and Mycorrhiza Ecology & Ecophysiology Research Group
- Soil Microbial Ecology Group

Vertebrate Conservation Discussion Group

The group is coordinated by Dr. Karen Hodges. Members include: Dr. Michael Russello, Dr. Jason Pither, Dr. Adam Ford, and their lab members. This group meets weekly from September through April.

Computational Ecology Research Group

The group is formed by: Dr. Lael Parrott, Dr. Rebecca Tyson, Dr. Robert Lalonde, Dr. Jason Pither and their lab members. The group meets weekly through the academic year.

Soil Microbial Ecology Group

The group is formed by: Dr. Louise Nelson, Dr. Melanie Jones, Dr. Dan Durall, Dr. Miranda Hart, Dr. John Klironomos and their lab members.

3.7. Research Groups within BRAES

Our Institute has formed thematic research groups that meet every week to present their recent work, to discuss research papers of interest, or to have invited guests present their work.

The current groups are:

4. BRAES ACTIVITIES



4.1 Speaker Series, Seminars, Workshops, Conferences and Forums

4.1.1. BRAES partners in the classroom speakers 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.

4.1.2 Distinguished Guest Speakers

BRAES hosts 2-3 distinguished scientists per year to speak on environmental topics of broad interest. The guest stays on our campus for about a week to have the opportunity to interact and meet with our members, and deliver a public talk.

4.1.3 Research Seminars

In addition to our distinguished speakers series, BRAES organizes research seminars, where other academics visiting our campus present their research to our members and the campus community.

4.1.4 Workshops Series

The series includes a succession of workshops that are offered during the school year on relevant topics of interest to researchers in the university community and BRAES partner organizations.

4.1.5 Biodiversity Research Seminar Series streaming from the Biodiversity Research Centre in Vancouver

In January 2016, BRAES began a partnership with the UBC Biodiversity Research Centre to stream to our campus their renowned Biodiversity Research Series. Every Wednesday at noon the Centre hosts invited researchers in biodiversity to speak in the Beaty Auditorium at the UBC Biodiversity Museum. From September 2017 through April 2018, we were able to stream from UBC Vancouver 23 presentations and we had 2 live presenters in Kelowna that were streamed into the Beaty Auditorium. Based on this success, we will continue working together with the Biodiversity Research Centre for the 2019-2020 academic year.

4.1.6 Okanagan Research Forum

BRAES and its partner organizations host every two years the Okanagan Research Forum. The last Forum took place in December 2018.

The forum topic was: “Eating the Okanagan” Exploring Change in our local food systems, and the event was co-hosted by the UBC Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) and the UBC Institute for Community Engaged Research (ICER). Next Forum is planned for December 2020 but it might be re-scheduled due to Covid-19.

4.1.7 BRAES Social Events

Once or twice a year our institute hosts a social event where all our members have the opportunity to share stories and successes in an environment different than the research one. Last year BRAES hosted one social event at the end of April.

4.1.8 Partnership with BC Institute of Agrologists

Every year as part of our partnership with the BCIA, both organizations cohost different events, during the 2019-2020 academic year BRAES and BCIA organized 1 event, the BCIA- BRAES Joint Professional Development Workshop that happened on November 14, 2019, 8:00 am – 4:30 pm. This is a very important partnership for the Institute and we are working together in planning new events for the 2020-2021 academic year.

Table 1: Summary of BRAES Events, 2019-2020

BRAES EVENTS 2019-2020							
Year	Date	# of Events	Speaker	Type of Event	Event Name	Attendants	Virtual
2019	Oct. 3	1	MP Candidates	100 Debates on the Environment	100 Debates on the Environment	110	
2019	Sep. 18	1	Emanuel Machado	Guest Speaker	Nature's role as Municipal Infrastructure	29	
2019	Nov. 14	1	Various	BCIA-BRAES events	BCIA-BRAES Professional Development Workshop	25	
2019	Nov. 6	1	Michael Malay	Guest Speaker		15	25
2020	Feb. 26	1	Sheila Watt Cloutier	Guest speaker	Building Community Resilience in a Changing Climate	406	
2020	Mar. 3	1	Anne Pringle	Guest Speaker	The population genomics of the invasive detah cap in California reveals a paradox: Copious sexuality and abundant spore production don't enable long distance Dispersal	40	35
2020	Mar. 4	1	Anne Pringle	Graduate Research Seminar	Watching yoyur work in the world: Women in science and the sticky issue of appropriation	25	
2019	Apr. 6	1		BRAES Social		30	
2019-2020		25	Various, see list attached	Biodiversity Seminar Series		375	
2019-2020		36	Computational Ecology Research Group (CERG)	Research Group Meetings		360	
2019-2020		24	Vertebrates Research Group	Research Group Meetings		288	
Sub totals						1703	60
93		Events			TOTAL		1763

4.2 Outreach Activities



Website

The Institute has an active website that is updated regularly with new information and activities. The website can be found here: <http://BRAES.ok.ubc.ca/>

Outreach Activities:

BRAES, as stated in its goals, is working more and more with non-academic partners. During 2019-2020 BRAES co-hosted several events with partner organizations, See table 1 on page 18 for more information about our events

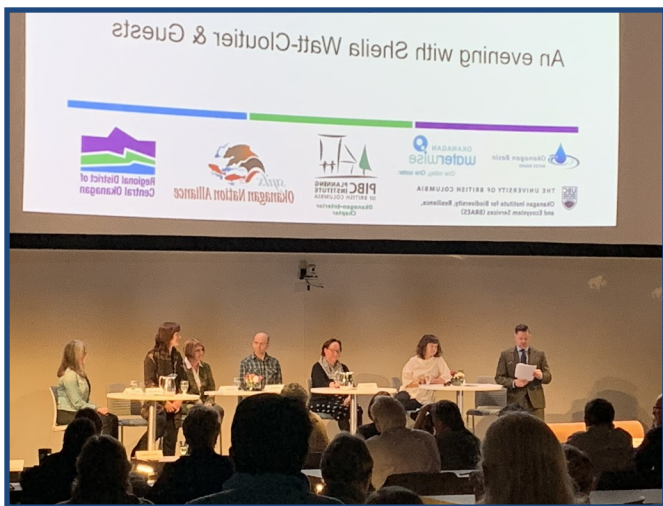
BRAES Outreach at a Glance

BRAES members were involved many other activities such as conference presentations, invited talks, meetings and workshops, media interviews and publications among others:

50 Conference presentations as speaker or keynote. See Appendix 3 for a selected list

35 Media interviews and newspaper articles

5 Conferences organized



Community Events



Biodiversity Seminar Series



Graduate Research Seminars



Invited Guest Speakers



Debates for the Environment



Professional development activities

5. BRAES CONTACT INFO

For general information or inquiries about BRAES,
please visit our website at:
<http://braes.ok.ubc.ca/> or contact:

Dr. Lael Parrott

Director, the Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services

Tel: 250-807-8122

Email: lael.parrott@ubc.ca

Or

Carolina Restrepo-Tamayo

Coordinator, The Okanagan Institute for
Biodiversity, Resilience, and Ecosystem Services

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Email: carolina.restrepo@ubc.ca

APPENDIX 1: BRAES FACULTY MEMBERS

- John Braun, Arts and Sciences
- Sylvie Desjardins, Arts and Sciences
- Aleksandra Dulic, Creative and Critical Studies
- Michael Deyholos, Arts and Sciences
- Daniel Durall, Arts and Sciences
- Sylvia Esterby, Arts and Sciences
- Adam Ford, Arts and Sciences
- Greg Garrard, Creative and Critical Studies
- Robert Godin, Arts and Sciences
- Kevin Hanna, Arts and Sciences
- Miranda Hart, Arts and Sciences
- Karen Hodges, Arts and Sciences
- Nancy Holmes, Creative and Critical Studies
- John Janmaat, Arts and Sciences
- Melanie Jones, Arts and Sciences
- Laura Hooker, Arts and Sciences
- John Klironomos, Arts and Sciences
- Robert Lalonde, Arts and Sciences
- Karl Larsen Thompson Rivers University
- Bruce Mathieson, Arts and Sciences
- Susan Murch, Arts and Sciences
- Louise Nelson, Arts and Sciences
- Lael Parrott, Arts and Sciences
- Michael Pidwirny, Arts and Sciences
- Jason Pither, Arts and Sciences
- Scott Reid, Arts and Sciences
- Michael Russello, Arts and Sciences
- Rebecca Tyson, Arts and Sciences
- John Wagner, Arts and Sciences
- Ian Walker, Arts and Sciences
- Adam Wei, Arts and Sciences

APPENDIX 2: BRAES SELECTED LIST OF PUBLICATIONS

A selected list of our member's publications can be requested from our Coordinator

APPENDIX 3: BRAES SELECTED LIST OF PRESENTATIONS

A selected list of our member's presentations can be requested from our Coordinator.

APPENDIX 4: BRAES SELECTED LIST OF PROJETS

A selected list of our member's projects can be requested from our Coordinator.



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

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