



CFES  **FCST**

Canadian Federation
of Earth Sciences

Fédération Canadienne
des sciences de la terre

The Canadian Federation of Earth Sciences Education and Outreach programs and initiatives

Beth McLarty Halfkenny, CFES President
CGEN Past President
EdGEO National Committee

CCCESD Annual Meeting, Ottawa, 2022

CFES Mission statement



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CFES is the coordinated voice of Canada's Earth Science community, ensuring that decision makers and the public understand the contributions of Earth Science to Canadian society and the economy.

CFES Strategic Objective #3



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Objective #1: Provide coordinating role and common voice for member organizations and the Earth Science community in Canada

Objective #2: Coordinate public policy advocacy on behalf of Earth Science in Canada

⇒ **Objective #3: Facilitate public awareness of Earth science and Earth science literacy**

Objective #4: Represent and promote Canadian Earth Science internationally

Objective #5: Provide service to member organizations in particular, and to the Earth Science community in general

Objective #6: Coordinate support for professional and academic organizations in Canada

CFES Strategic Initiative #3



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Objective #3:

- a) Ensure all existing ES public awareness and ES literacy initiatives under the auspices of CFES thrive and expand, including CGEN and EdGEO
- b) Champion further success of Geoparks movement in Canada
- c) Expand CFES's engagement with the public



Canadian Geoscience Education Network (CGEN)

CGEN is the education arm of the Canadian Federation of Earth Sciences (CFES)

- Founded in 1996
- A national network of volunteers from all sectors of geoscience
- Focused on increasing public awareness of Earth science
- Supporting Earth science literacy at all levels of education across Canada.



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CGEN President
serves as the
CFES Outreach
Director



CGEN's Guiding Principles:

1. As the outreach and education arm of the Canadian Federation of Earth Sciences (CFES), CGEN's mandate is threefold:
 - promote teaching of the Earth sciences at all levels of school and university/post-secondary
 - encourage continuing education of Earth scientists in earth science outreach and K-12 education
 - stimulate activities that increase public appreciation and understanding of the Earth sciences and our planet



CGEN RCEG
Canadian Federation of Earth Sciences / Fédération Canadienne des sciences de la Terre

Founded May 19, 1993

600 strong

The Canadian Geoscience Education Network (CGEN) is the education arm of the Canadian Federation of Earth Sciences.

Le Réseau canadien d'éducation géoscientifique (RCEG), relève de la Fédération canadienne des sciences de la Terre.

CGEN CANADA WIDE

Geoscience education

Public awareness of geoscience

A forum for discussion of matters related to geoscience

Legacy Projects

FOUR BILLION YEARS AND COUNTING

11111 10 CGEN Members

Current registered user data is below the reporting deadline

Comprised of:

- Geoscientists
- Academia - college and university
- Teachers (K-12)
- Informal and outreach educators (museum, science centres, etc.)

Find us on:   

Contact us
Email: cgenrss@gmail.com
Website: <http://earthsciencescanada.com/cgen/>

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CGEN's Guiding Principles:

2. CGEN will work to coordinate the efforts of the Canadian Earth science community in these matters by providing

- leadership for core national activities
- a forum for **information exchange and networking** amongst Canadian groups working in earth science education, maximizing synergies and minimizing duplication of effort across the country.

3. CGEN will act as a forum for discussion of matters related to earth science **education policies and practices** in Canada.

4. CGEN will liaise with similar bodies in other countries as appropriate.





EdGEO

Canadian Earth Science Teacher Workshop Program

- ▶ Principal Activity of the Canadian Geoscience Education Network
- ▶ supports delivery of high-quality professional learning opportunities for Canadian teachers seeking knowledge, resources, and confidence since the 1970's through:
 - grants up to \$3000
 - curriculum resources
 - facilitator support and participation of CGEN members

https://www.edgeo.org/en_CA/





CGEN RCEG

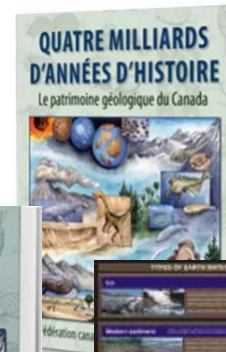
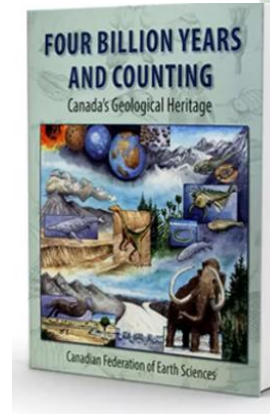
Canadian Geoscience Education Network
Réseau canadien d'éducation géoscientifique

CGEN Resources

Check out our website

<https://www.cgenarchive.org/>

for loads of geoscience
education resources!



Earthlinks Teacher Resources



Geoscape Posters



Educational Outreach Public Engagement Guidebook



**Sensibilisation et
mobilisation du public**

Guide pour les comités organisateurs
de l



**Educational Outreach
and Public Engagement**

A Guidebook for Geoscience
Conference Organizing Committees

- ▶ An RFG2018 Legacy Project
- ▶ for conference local organizing committees
- ▶ provides guidance for building Educational Outreach and public engagement events and programs into national geological conferences and meetings
- ▶ CGEN and EdGEO member contributors



earthsciencescanada.ca

“The HUB”

- ▶ IYPE Legacy project, to house all CFES websites and program links in one place - One Stop Shop
- ▶ Transitioning to Wordpress to ensure stability and ease of content management



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Earth Science Careers website rebuild

- ▶ A legacy project of IYPE in 2008/09 that needs an update - functionality, content, design

Focus on helping youth

- imagine themselves in a career in Earth science
- see the breadth of jobs you can do with an ES education
- the diversity of people doing those jobs

short biographies
captivating images
30 second videos

“I’m Amanda McCallum and I am a geoscience educator, consultant and entrepreneur, and today, this is my workplace!”

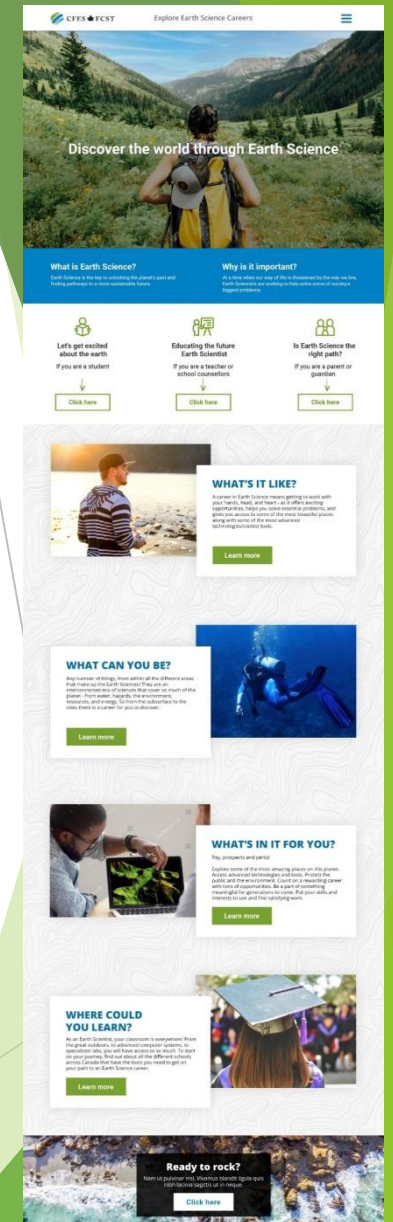
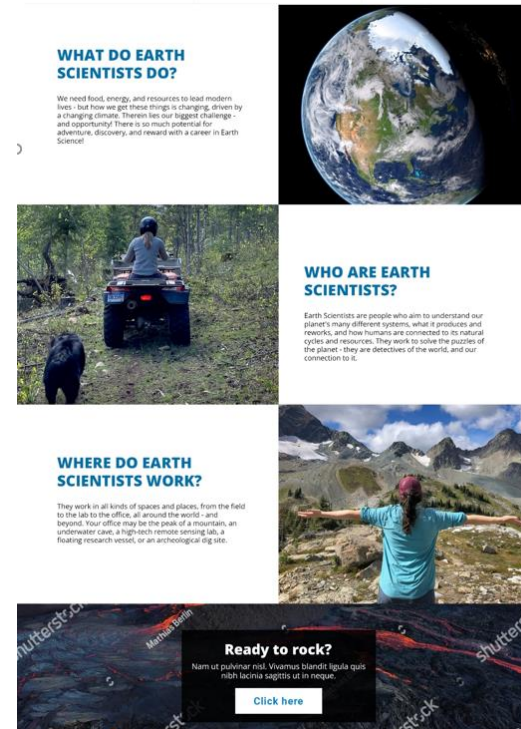


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Explore a Career in Earth Sciences website refresh



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Geoscientists in Canadian National Parks

- **What?** Parks Canada volunteer geoscience residency - CFES/Parks Canada partnership
- **Who?** an Earth Science Specialist/Communicator/Practicing or Retired or Upper Level Post-Secondary Student studying Geoscience at a Canadian University
- **What will they do?** educate Park visitors and staff about the geological formations and phenomena of the Park by delivering programs and presentations.
- **Funding?** Association of Professional Geoscientists of Ontario Education Foundation (APGOEF) grant for travel, food, and accommodation expenses incurred by the volunteer
- **Pilot:** August 15 -26, 2022 in Pukaskwa National Park, Ontario



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Parks Canada



APGO
education
foundation

Promoting Geoscience Group



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- ▶ CCCESD members, Geoscientists Canada, CFES members and others
- ▶ Working together to find solutions to declining enrolment

- ▶ Geoscience faces a crisis in public perception
 - ▶ BUT
- ▶ Geoscientists and geoscience education are needed now more than ever to help solve global challenges
 - ▶ SO
 - ▶ Let's get to work!



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Thank you!

<https://www.cfes-fcst.ca/>
<https://www.cgenarchive.org/>
https://www.edgeo.org/en_CA/
<http://earthsciencecanada.ca/>

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Ideas - a partial list of things that work

- ▶ NO need to reinvent the wheel - use existing programs and resources
- ▶ Find out where ES is taught in your regional curriculum and connect with those teachers
- ▶ Run a teachers workshop - use EdGEO funds for teacher resource kits, field trips, activity materials - use your spaces - use your people (faculty, staff) reach out to CGEN to find local geoscience educators
- ▶ Hold open houses and invite school students - run activities in lab spaces - engage your graduates and undergraduates to help
- ▶ Engage with the home school community - they are starving for places to do science
- ▶ Summer camps - engage young people, gain funds for an outreach program
- ▶ Rock parks and geological time trails (Waterloo) - engage the aggregate community to help source rocks and build the displays
- ▶ Your institution may have a community engagement office - find out how they can help you
- ▶ Promote the Earth Sciences Careers website when it is finished and help us communicate to guidance counsellors
- ▶ Celebrate the new annual UNESCO International Geodiversity Day October 6



CCCESD 2022 - Katherine Boggs Education & Outreach International Director for CFES

Katherine Boggs, Kevin O'Connor, Charles Neild (4th year), and many many others

Target Group - Grade 2-9



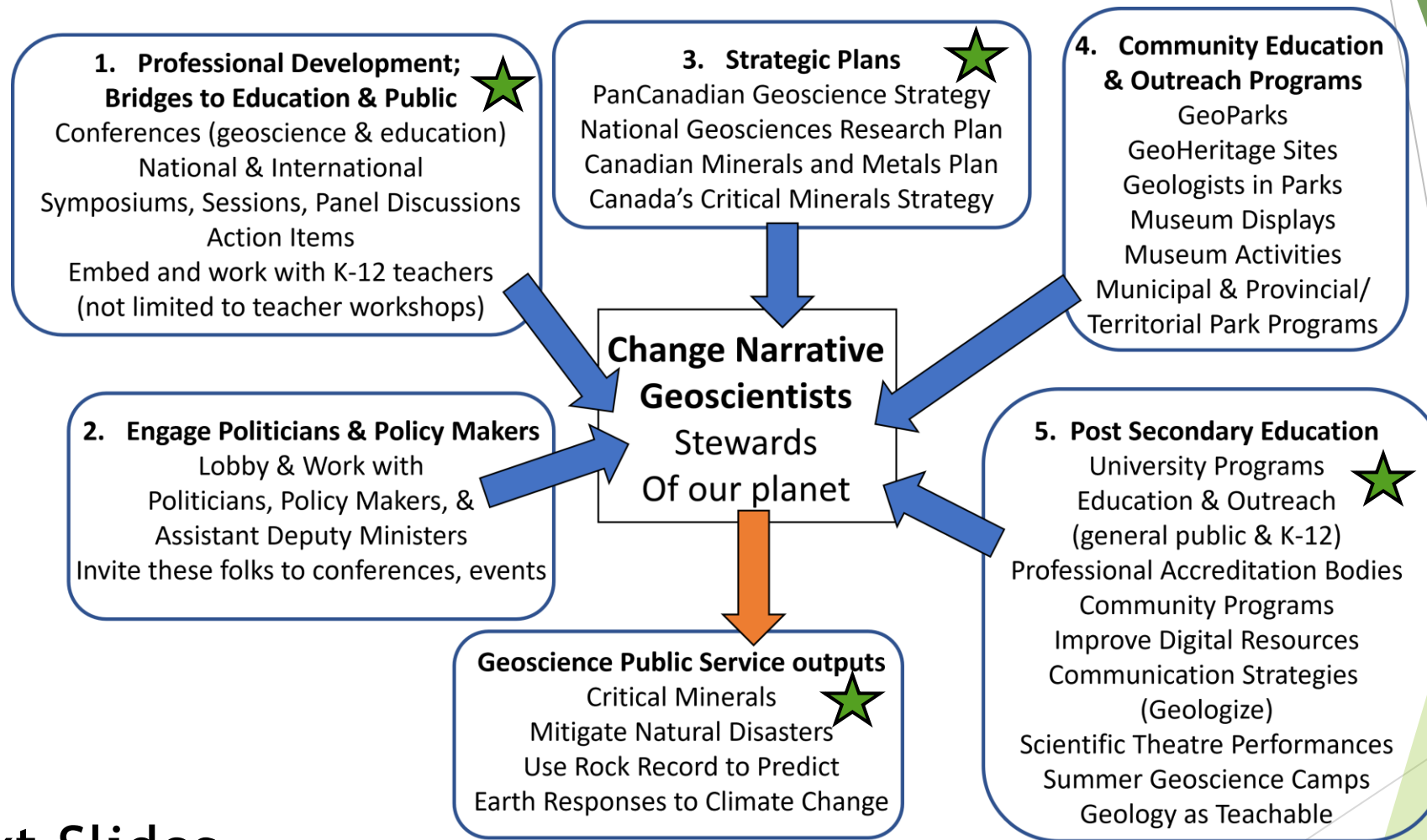
Murdoch with occupied box
Now PhD - Waterloo



Diana – now a Teacher

“Geological Bumble Bee Program” - Collecting Bumble Bee boxes – Calgary, Alberta, Canada (Boggs et al 2021)

1. Model - Change Narrative Around Geosciences (Boggs et al. - for 2023 - Geosciences Canada)



★ Next Slides

2. EON-ROSE

~1400 stations

Power & Communications

Real-time; openly available data

Interdisciplinary!!

Possible sensors:

- broadband seismometer
- GPS/GNSS
- MT & riometers
- cameras
- weather stations
- permafrost T
- atmospheric gases
- others?

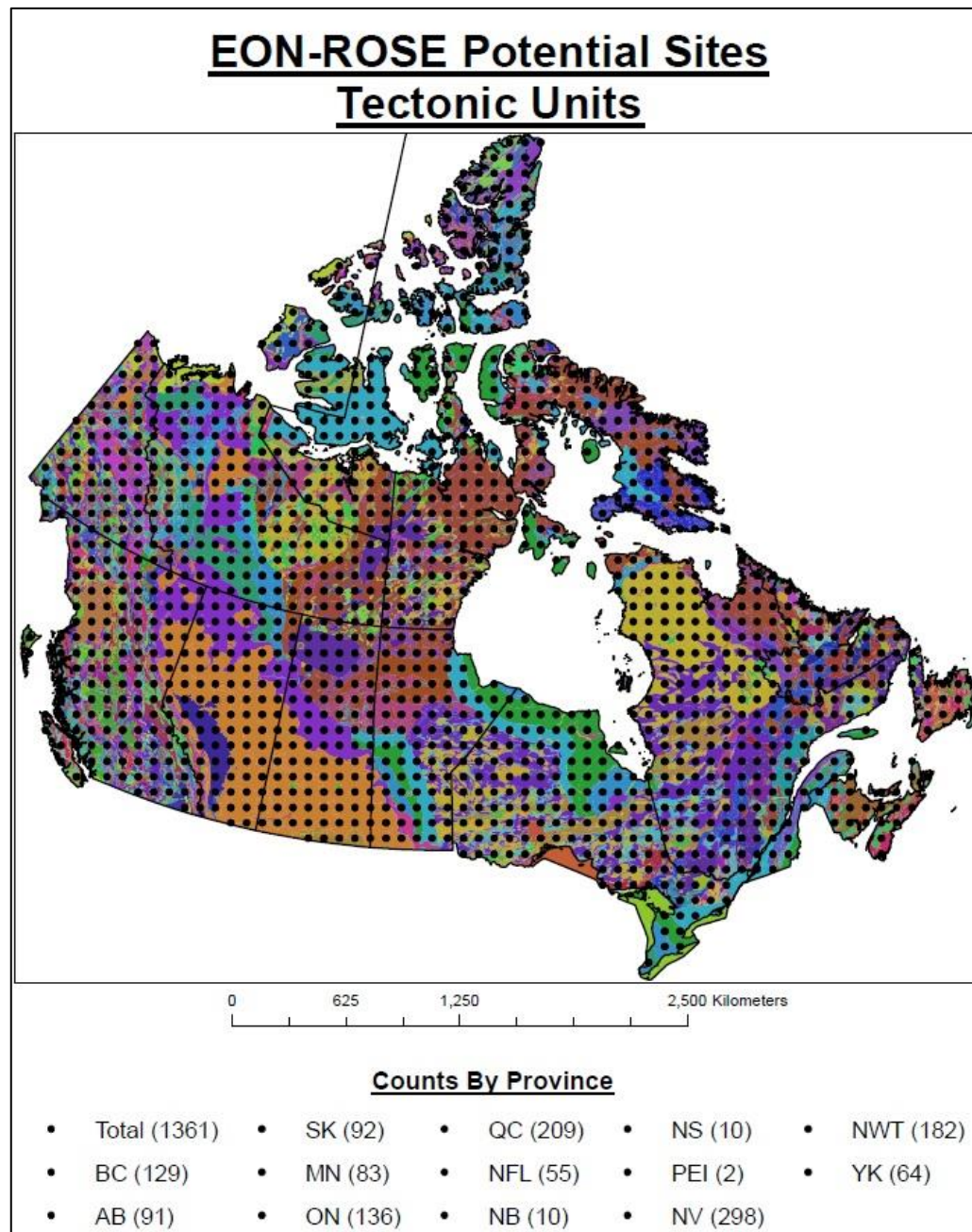
Also:

- Critical Zone Observatories
- Space Weather
- "Densify" arrays

?Collaborative drilling program

?Collaborative geochemistry
& geochronology

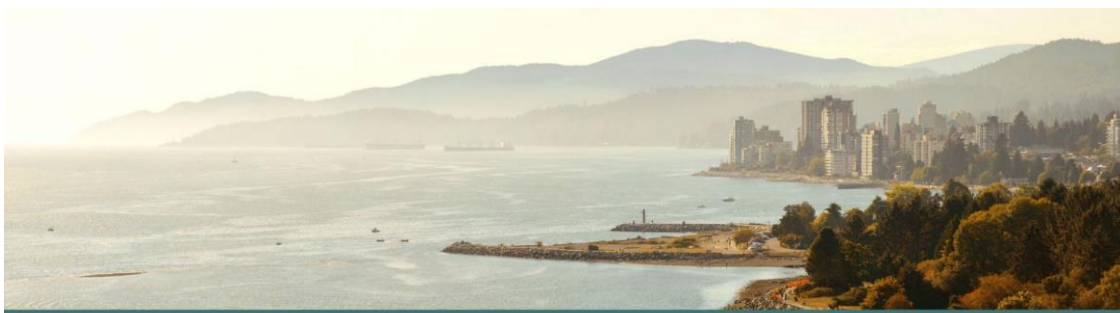
- "other supporting geosciences"



Relevance?

LITHOPROBE:

- 1985-2005
- 1000 geoscientists – 1500 scientific papers
- time Canada was a “brain sink” for geosciences
- evidence for what Canadian geosciences are capable of when we work together



EON-ROSE Scientific Workshop

Towards a Plate Boundary Observatory in the Canadian Cordillera



25 – 28 April 2022
Nanaimo, British Columbia and Online



July 2018 - Experimental Station (Yukon)
- \$300K UofC seed funds

2019 to 2021 – First two pilot programs
--\$500K – Geoscience BC + NSERC
Alliance + in kind wages
-41 geoscientists from 9 universities

April 2022 – First EON-ROSE workshop
~300 participants from Europe, Morocco, across North American + in person in Nanaimo

Day #1 – Induced Seismicity (Pilot Project #1 – monitoring around Fort St John, BC)

Day #2 – Mineral Exploration collaboration

Day #3 – GNSS collaborations

- \$5M to CGS; \$1.5M + CFI to UNB

Day #4 – Assessing Geothermal Potential at Mt Meager (Pilot Project #2)

SSHRC CONNECTION - \$20K to bring CSL team (next slide)



3. Community Science Liaison Program (Boggs et al 2021)

-guide/mentor K-12 citizen science

Target Group of Helpers (Grade 2-9)



e.g. Geological Bumble Bee Program

Curriculum Based:

Science grades 1-3 - life cycles

Winter: build boxes

Spring: install boxes

Fall: collect boxes & analyze

occupation (~30% around Calgary)

-since 2012 ~800 grade 2-9 built & installed ~800 Bumble Bee Boxes, (and described glacial till)

3. National Geoscience Research Plan

-for academics, accompany the survey panCanadian geoscience strategy
-carry on from Mostafa Fayek (UofM) - previous CFES International Directory

Main Components:

1. Earth Resources - minerals, energy, other resources (water & soil)
2. Global Change and the Environment
3. Natural Hazards - earthquakes, tsunamis, volcanoes, floods
4. Education and Outreach (train HQP for future)



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Thank you!

Questions?
Ideas?

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