



Careers in the Modern Minerals Industry

Environmental Careers in
the Mining Industry

January 21st, 2020

Presentation Outline

- ❑ Ecofish Research Overview
- ❑ Your Presenters
- ❑ Impact Assessment & Mining
 - Impact Assessment Process
 - Permitting & Management Planning
 - Monitoring & Adaptive Management
 - Mine Closure
- ❑ Possibilities

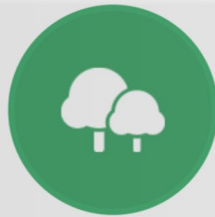
Ecofish Research Overview

Ecofish Staff Expertise

Position	Approx. # of Employees
Executive (owners and directors)	7
Scientists/Engineers (hydrology, fish, wildlife, terrestrial)	38
Field Technicians	20
Data Analysts/GIS	10
Project Managers	20
Administration (IT, BD, payroll, etc.)	15



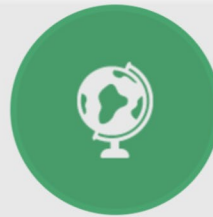
SCIENTIFIC EXCELLENCE



PROFESSIONAL
ENVIRONMENTAL
ETHICS



BUSINESS DISCIPLINE



SOCIAL RESPONSIBILITY

Team of ~110 scientists, engineers, project managers, technology experts, and other professional staff.

Ecofish Research Overview

Our Offices

- Campbell River
- Courtney
- Nanaimo
- Victoria
- Cranbrook
- Terrace
- Squamish
- Vancouver
- Halifax
- Toronto



Ecofish Research Overview

Our Experience

Environmental Assessment & Closure Planning :

- KSM Project – Copper, Gold, Silver, Molybdenum - BC
- Pueblo Viejo – Gold – Dominican Republic
- Agua Rica - copper, gold, silver, and molybdenum – Argentina
- Hackett River – Silver – Nunavut
- Jansen expansion – Potash – Saskatchewan
- Hope Bay Doris North expansion – Gold - Nunavut

Permitting:

- Eagle Gold Mine – Gold – Yukon Territory
- Fording River and Greenhills expansions – Coal- BC
- Apple Bay Quarry – Geyserrite- BC
- Maggie – Copper, Molybdenum - BC
- Dome Mountain – Gold, Silver - BC
- Harper Creek - Gold - BC
- Galore Creek – Gold - BC
- Blackwater Mine – Gold - BC
- Ekati – Diamonds - Northwest Territories

Third-Party and Government Reviews:

- Sukunka Project – Coal – Northeastern BC
- Roman mine – Coal – Northeastern BC
- Borden Mine – Gold - Ontario



Our mining sector experience.

Your Presenters

- Extensive expertise in the application of environmental and social science for major projects
- Assist clients with environmental and social management, effects assessment, and monitoring
- Expertise in the coordination of a multi-disciplinary teams
- Manage large teams to complete environmental assessment and monitoring programs for major projects



**Sean Cullen, MSc., R.P. Bio
Manager, Environmental
Assessments**



**Justine Knox, BSc.
Senior Project Manager**

Your Presenters

Justine's Career Path



Government
of Canada

- Global Resource Systems - UBC Faculty of Agricultural Science
- Kampala, Uganda - participatory appraisal
- Researching natural resource extraction and conflict
- Minority Rights Groups International
- Environmental Assessments and Consulting
- UBC Integrated Watershed Management
- Canadian Environmental Assessment Agency
- Victoria Gold Corporation
- Water and Environmental Law at IHE Delft
- Ecofish Research



Your Presenters

Sean's Career Path



ONTARIO
SCIENCE
CENTRE

Queen's University



SFU

- Dreams of National Geographic Exploring
- Ontario Science Centre School
- Queens University
- Manomet Observatory for Conservation Science
- Centre for Wildlife Ecology – SFU / Env. Canada
- Independent Consulting Biologist
- Rescan Environmental Consultants (now ERM)
- Ecofish Research and AME Volunteer

Impact Assessment & Mining

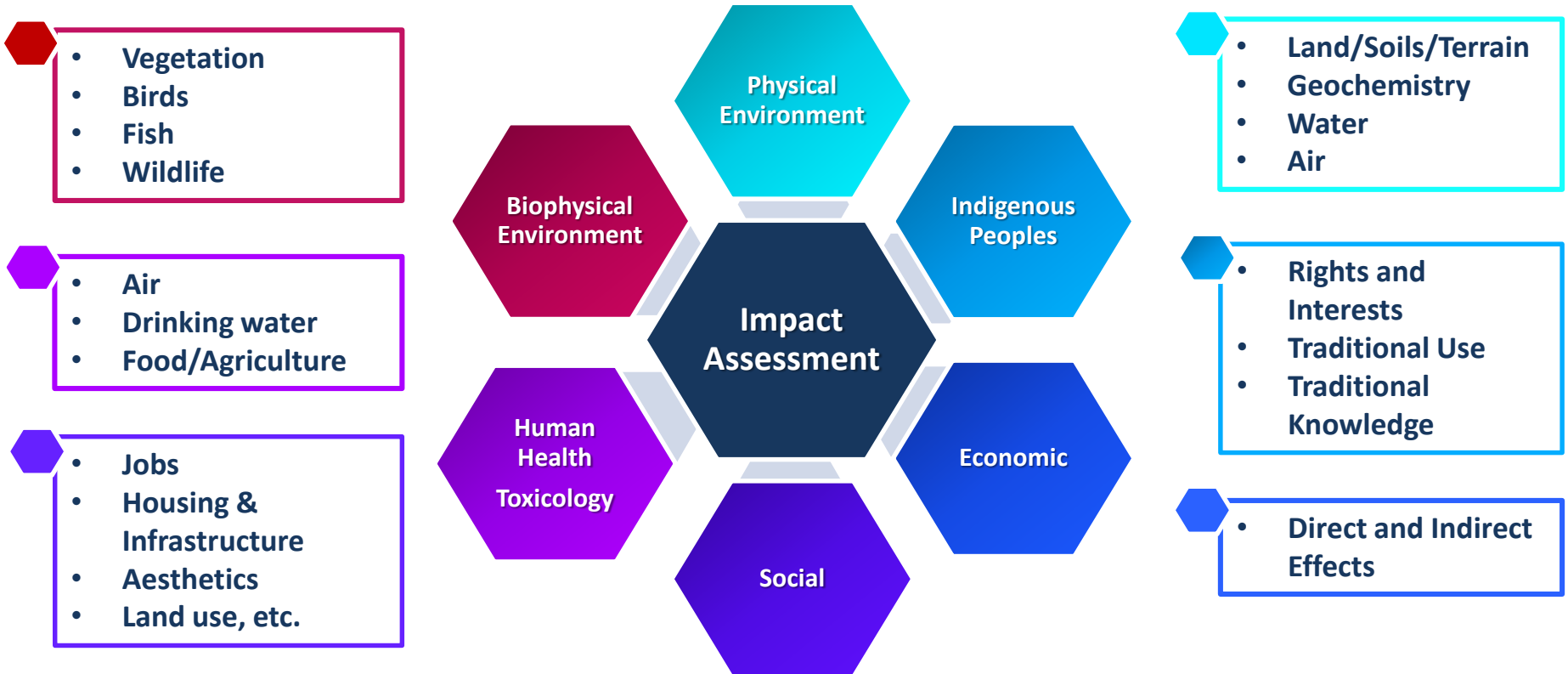
A Planning Process



The assessment process is important for the protection of the environment and indigenous rights.

Impact Assessment Process

Breadth of Disciplines



The assessment process involves input from a wide range of environmental and socio-economic experts.

Impact Assessment Process

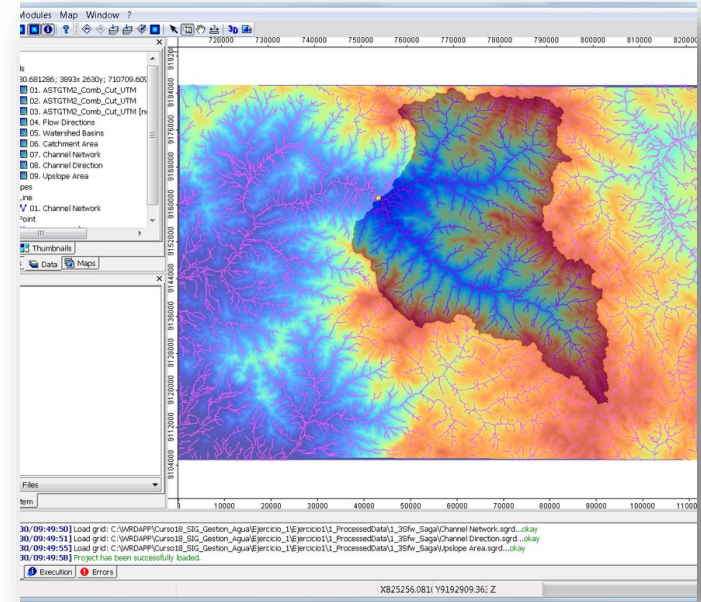
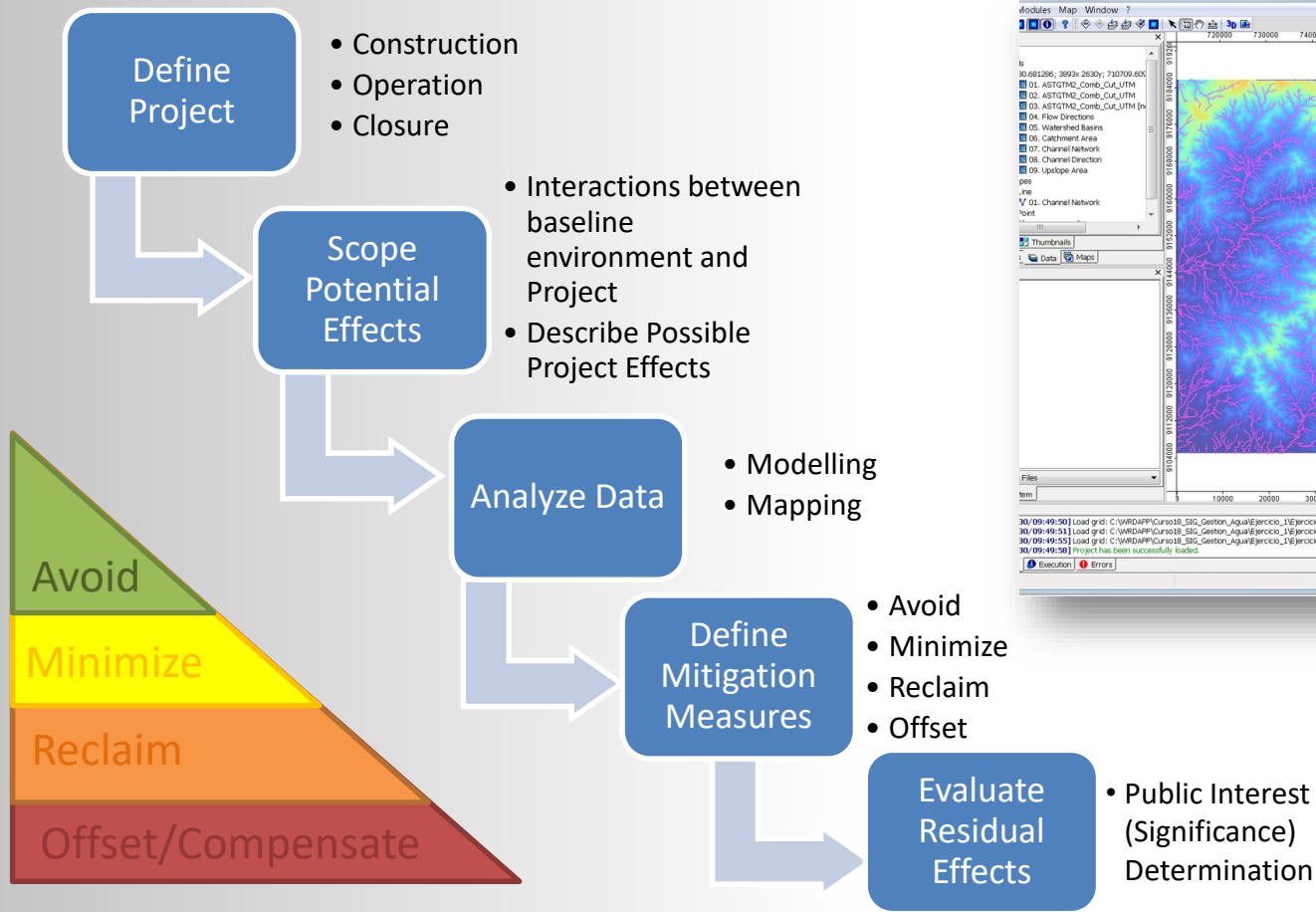
1. Baseline Fieldwork



Baseline data collection involves fieldwork and data management.

Impact Assessment Process

2. Impact Assessment



Preparation of an environmental assessment application mainly involves office work – research, computer modelling, writing

Impact Assessment Process

3. Breadth of Impact Assessment Review



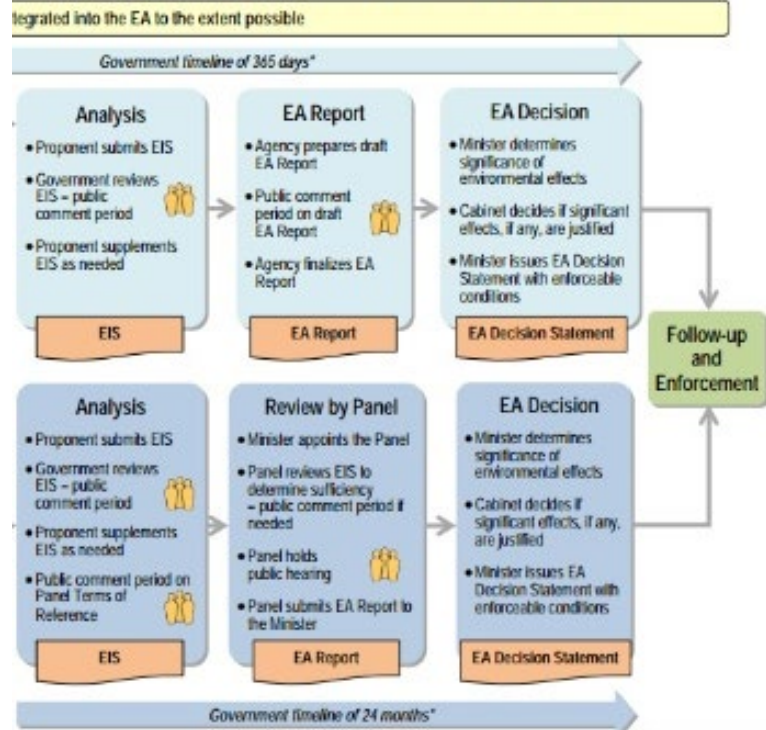
Review involves workshops, meetings, and hearings. Environmental consultants may provide services to any of these organizations

Impact Assessment Process

4. Government Decision & Conditions

- **Decision:**
 - Agency makes a recommendation to the Minister, based on the Review.
 - Must be satisfied that the Crown's duty to consult and accommodate Indigenous peoples has been adequately fulfilled.
 - Decision/Public Interest determination made by the Minister.
- **Decision is subject to Conditions:**
 - Conditions are based on key mitigation measures and form the certificate
 - Conditions hold Proponent accountable and for oversight of the project's impacts.
 - Conditions are enforceable

PROCESS MANAGED BY THE AGENCY



Government
of Canada

Gouvernement
du Canada

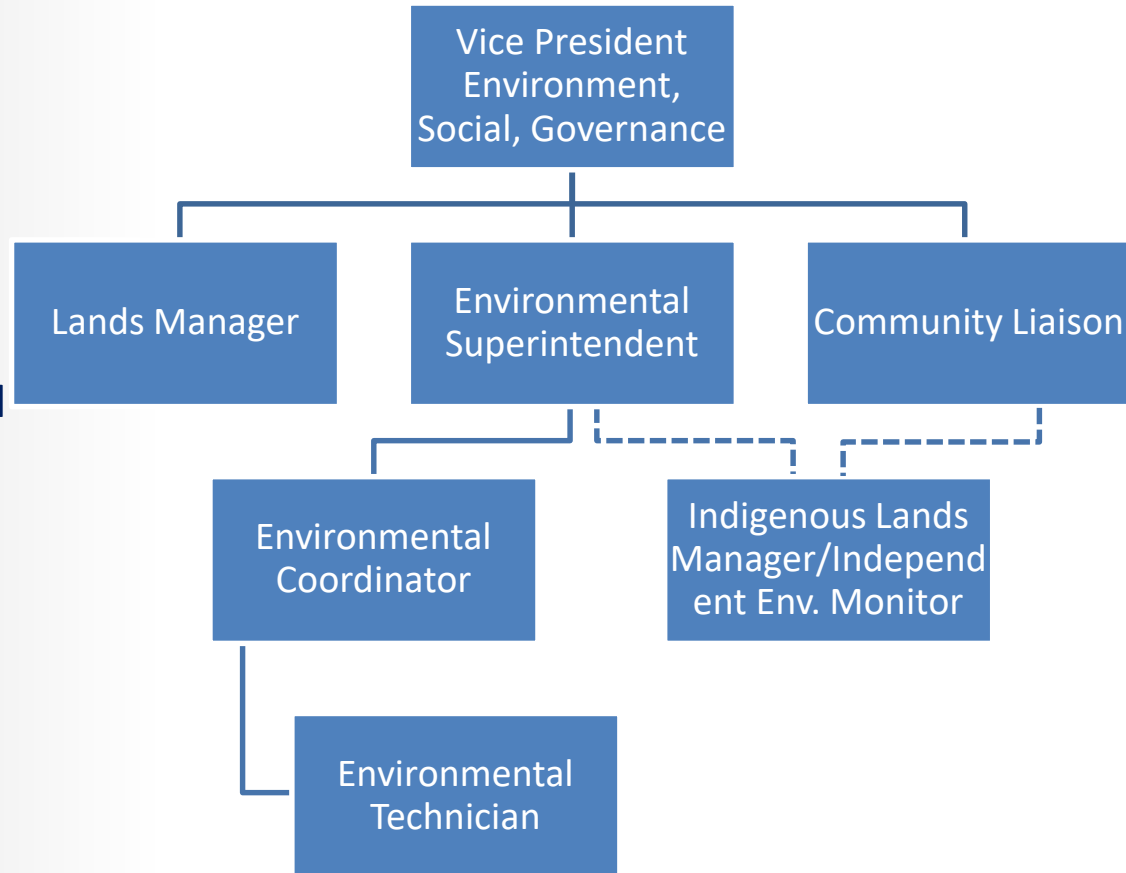
Government roles involve administering the process, working with indigenous governments and proponents, making recommendations on project decisions and conditions.



Impact Assessment & Mining

5. Permitting & Management Planning

- Permitting builds on the Impact Assessment for specific Activities
- Management Plans describe how licence conditions will be met are developed.
- Mining companies develop/expand their environmental team.
- Working with local Indigenous governments.
- Possibly hiring independent Indigenous Monitor(s) to meet commitments of an Impact Benefit Agreement (for example)



Permitting builds on impact assessment for specific activities and involves planning for construction and operation.

Impact Assessment & Mining

6. Construction/Operation Monitoring & Adaptive Management

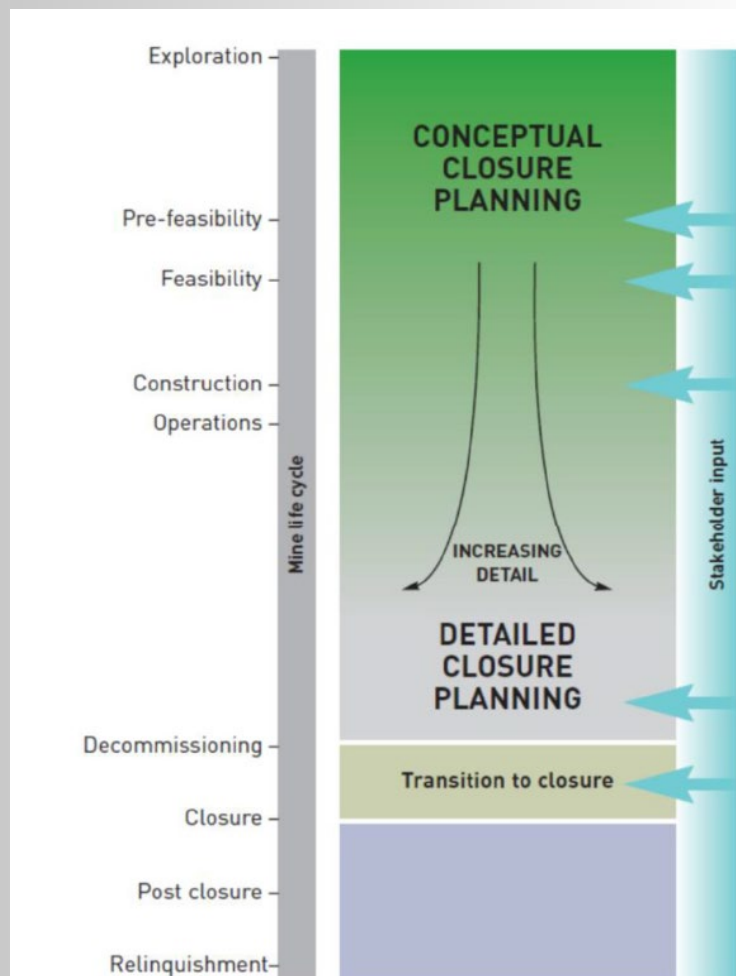
- Construction & Operations Compliance Monitoring involves fieldwork (shift-work), e.g.,
 - Erosions and Sediment Control
 - Water Quality Compliance
- Independent Indigenous Monitors
- Ensuring compliance with conditions
- Analyzing data against triggers and making adjustments
- Communicating with Inspectors, Regulators, local Lands dep't



Ensuring compliance and validating impact assessment predictions involves field monitoring during mine construction and operation.

Impact Assessment & Mining

6. Mine Closure



Mine closure is considered throughout the impact assessment process and refined through operations, often involving research in partnership with institutions.

Did you know you could be:

- **Hydro-geochemist**
- **Environmental Toxicologist**
- **Economic Modeller**
- **Social and Community Consultation Expert**
- **Indigenous Environmental Lawyer**
- **Graphic Designer**
- **GIS Specialist**
- **Statistician**
- **Safety coordinator**

There are so many roles in the environmental field, here are some examples of roles your students may not know exist!

... but who knows in the Future?

Ecofish Research & Innovation

- eDNA
- Data Management Advancements
- Use of UAV and remote telemetry



EcoDAT

DATA MGMT. SYSTEM



There are so many roles in the environmental field, here are some examples of roles your students may not know exist!

Thank you!

