



The Environment, Community and Health Observatory (ECHO) Network

Summary of Outcomes, Learning and Pathways Forward

2017-2021



Environment
Community
Health
Observatory
Network

Réseau
observatoire sur
l'environnement
les communautés
et la santé



Canadian Institutes of
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Title photo: ECHO Network members at the launch of ECHO in 2017, standing at the confluence of the Nechako and Fraser Rivers, on the unceded and traditional territories of the Lheidli T’enneh people in Prince George

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Warm acknowledgements to ECHO Partners:





A synthesis of ‘ECHO’

In May 2017, a five-year initiative called ECHO (Environment, Community and Health Observatory) was launched on the unceded territories of the Lheidli T’enneh, now called Prince George, Canada.

ECHO aims to strengthen intersectoral capacity to understand and respond to the health impacts of resource extraction, and especially impacts felt by rural, remote and Indigenous communities. Resource extraction refers to human activities such as mining, oil and gas, forestry, agriculture, fisheries, aquaculture and nature-based tourism.

This report summarises ECHO’s purpose, outputs, tools and processes, outcomes, learning and pathways to consider for future integrative work. It is based on an analysis of ECHO documentation, interviews and workshops with ECHO network members and insights from ECHO knowledge sharing sessions in November 2021. A detailed ECHO overview report is available at <https://www.echonetwork-reseaeuecho.ca/resources>, along with other ECHO resources and publications.



ECHO – a network and learning community

ECHO is a learning network that develops tools and processes to illuminate and respond to the combined environmental, community and health impacts of resource extraction. ECHO aims to counter the environment, community and health (E-C-H) ‘integration gap’ - the tendency to separate issues, impacts, knowledge, skills and sectors.

As in integrative learning network, ECHO connects data, information, experts, sectors, thinking and practices. It received \$2M Canadian Institutes of Health Research funding over five years to:

- **Design, test and share integrative data collection, tools and processes** relating to the health impacts of resource extraction.
- **Work collaboratively** across sectors, jurisdictions and disciplines.
- **Design and support intersectoral responses** to the cumulative, long-term health impacts of resource extraction.

ECHO aspired throughout to recognise and value indigenous knowledge and leadership, engage young people and local communities, grow a new cadre of researchers and practitioners who can work in integrative ways, and showcase the potential of public health observatories that have the integrative capacity to support intersectoral decision-making.

The University of Northern British Columbia’s (UNBC) Prince George campus is home base for ECHO. ECHO’s work is grounded locally in [four regional cases](#) across Canada, with each case involving a health

organisation or community organisation research partner who was resourced to engage with ECHO. Half of ECHO’s funding was split across its regional cases, and each regional case held a broad focus and developed its own approach to developing, applying and refining integrative ECHO tools.

Figure One: ECHO Regional case partners and areas of focus

Research partner	Northern Health Authority , Northern British Columbia	First Nations Health Authority , British Columbia	Battle River Watershed Alliance	New Brunswick Environmental Network
Regional case focus	Community health and equity	Indigenous health	Health of ecosystems, wildlife, watersheds	Child health Climate and health
Initial tools focus	Integrative impact assessment tools	Digital geospatial tools	Indicator frameworks	Arts-based and narrative tools

Two [emerging regional cases](#) that collaborate with ECHO and form part of its Network have developed:

1. ECHO maintains active connections with the Oceania region (Aotearoa New Zealand, Hawai’i, Australia and Fiji). This collaboration has supported international exchanges, knowledge sharing and ongoing peer support.
2. ECHO has a productive relationship with the [Lake Superior Living Labs Network](#) in Northern Ontario, which connects academics and community groups across the Lake Superior watershed.

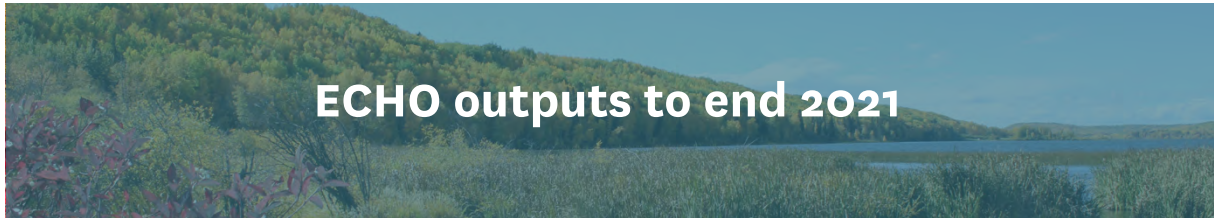
The ECHO Network’s **Learning Community** includes university researchers, research staff and trainees (from undergraduate to post-doctoral students), learning alongside knowledge exchange partners from health, environment and community organisations. This Learning Community is described further by Parkes et al 2019 and Sloan Morgan et al 2020. The ECHO Network Learning Community involved 133 members between 2017 and 2021.

Broad phases in the evolution of the ECHO Network have been:

1. Taking notice of integrative approaches to combined environment, community and health impacts of resource extraction across the Network (2017/18), using the [five ways to wellbeing](#) framework as a lens.
2. Trialling and refining integrative and intersectoral tools and processes within the regional cases (2018 on). These initial phases of integrative work raised issues around equity, diversity and inclusion within ECHO itself, and complicity with colonial structures that generate ongoing harms from resource extraction, as described in [Parkes et al, 2019](#) and [Sloan Morgan et al 2020](#).

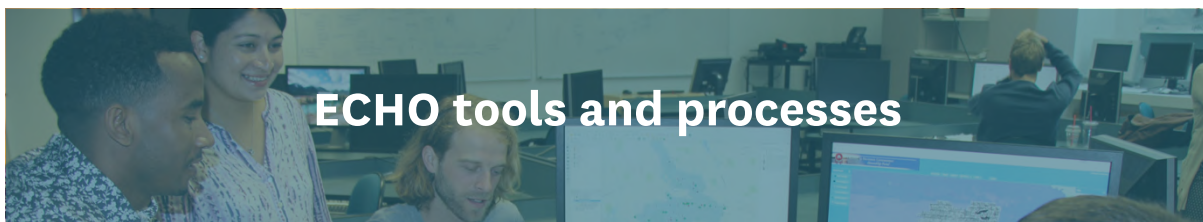
3. The ECHO Network’s midway point (2019/20), underscored the desire to move from knowledge to action across the Network, requiring clarification of what impact and value from ECHO would look like, and demonstrating action within ECHO and beyond.
4. Sharing findings, insights and orienting to what next for ECHO (2021 onwards).

A summary of key ‘outputs’ from ECHO is given below.



					
29	15	33	4	28	16
Peer reviewed publications	Conferences	ECHO tracked projects	Youth engagement events	Posters	Specific projects
ECHO funded: 9 ECHO influenced: 20	ECHO required: 6 ECHO influenced: 9	ECHO funded: 16 ECHO influenced: 17	ECHO funded: 1 ECHO influenced: 3	ECHO funded: 25 ECHO influenced: 3	ECHO funded: 16
					
132	52	18	27	27	33
Presentations	Trainees	Other creative outputs ¹	Reports	Weblogue series	Projects receiving external funding
ECHO required: 1 ECHO funded: 64 ECHO influenced: 32 ECHO ripples: 25	ECHO funded: 52	ECHO funded: 10 ECHO influenced: 1 ECHO ripples: 7	ECHO required: 7 ECHO funded: 8 ECHO influenced: 12	ECHO funded & ECHO ripples: 27	ECHO funded: 4 ECHO influenced: 26
					
15	7	8	4		
Maps	Fact sheets	Partner agreements	Awards		
ECHO funded: 15	ECHO influenced: 7	ECHO required: 8	ECHO influenced: 4		

¹ Including graphic recordings (6) and blogs (7) about ECHO.

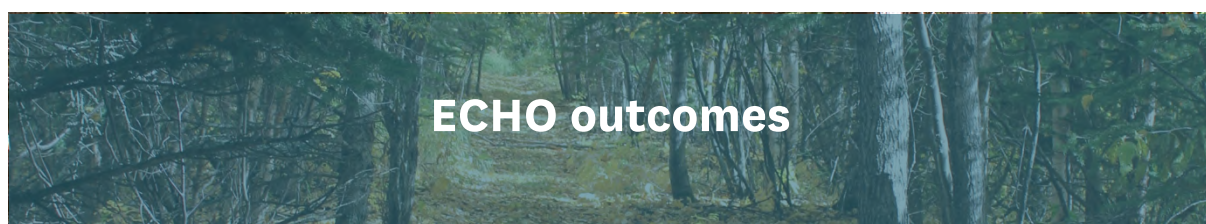


Six integrative tools and processes that ECHO has utilised or developed are described below, along with examples. These approaches to addressing the E-C-H integration gap are profiled on the [ECHO Website](#) and some are described in videos on the [ECHO YouTube Channel](#).

ECHO tools and processes

Summary of tools and processes	How they show up in ECHO
Arts based and narrative methods	<p>Arts and narrative based methods such as photovoice, graphic recordings, comic jams and digital stories provide rich ways to explore E-C-H issues, that can be integrated into face to face and virtual exchanges (see for example Martin Harris 2020). Gislason et al (2018) and de Leeuw et al (2017) explore these ideas further.</p>
Capacity strengthening for integrative work	<p>Capacity strengthening occurs through ECHO gatherings, tools and process development, projects, publications and presentations. ECHO has mentored researchers, knowledge exchange partners and community members to engage with the cumulative impacts of resource extraction. ECHO has also strengthened existing education and training programs to address these themes, including support for (and ECHO Team participation in) the CoPEH-Canada annual, multi-site field course on Ecosystem Approaches to Health.</p>
Geospatial Tools	<p>ECHO has used maps and geospatial tools to profile and share information about cumulative environmental, community and health impacts for ECHO Member and partner groups. This includes refinement of anthropogenic disturbance maps, linkages with the expanded BC LEO Network, developed by FNHA, and partnering to develop the Nechako Watershed Portal and ECHO Network Portal.</p>
Healing indicators	<p>Indicator frameworks tend to create disconnects between environment, health and community issues. Integrative responses developed by ECHO include:</p> <ul style="list-style-type: none"> • Healing indicators, which are co-designed using decolonial ‘two-eyed seeing’: with one eye informed by Indigenous ways of knowing and the other by western science. Diverse funding partnerships have been harnessed to progress ongoing Healing Indicators work, in conjunction with the First Nations Health Authority, and informed by the First Nations Population Health and Wellness Agenda, as well as related ecological indicator work (Stelkia et al 2021).

Summary of tools and processes	How they show up in ECHO
	<ul style="list-style-type: none"> • A “Health in the Watershed” Atlas, developed with the Battle River Watershed Alliance (for 2022 release) is an integrative framework for watershed level indicators with implications for future ‘State of the Watershed’ reporting.
Integrative assessment tools	<p>Responding to the need for more integrated assessment of the impacts of resource extraction has been a key focus for ECHO Members (see Brisbois et al 2021, Buse et al 2020, Hoogeveen et al 2021 and Hoogeveen et al 2020). Related tools and processes explored via ECHO in response to this need include:</p> <ul style="list-style-type: none"> • Risks and Benefits Calculator in partnership with New Brunswick Environmental Network • Integrated Regional Profile Guide, in partnership with the Cumulative Impacts Research Consortium (CIRC) • Adaptation of the CalEnviroscree methodology to the BC context in partnership with the CIRC, the Northern Health Authority, Office of Health & Resource Development, and the Centre for Environmental Assessment Research, leading to related pilots across the Network (Buse et al 2021).
Youth engagement	<p>Child and youth engagement in ECHO occurs through its regional cases, ECHO university students and trainees, and relationships formed with schools and communities that partner with the ECHO Network. One example is the Koh-Learning in our Watersheds project.</p>



ECHO has grappled with how to evaluate its work. The ‘[six conditions of systems change](#)’ (Kania et al, 2018) are used below to indicate ECHO’s key areas of contribution and outcomes. The strength of ECHO contribution to each systems change condition is indicated as follows.

Minimal (within and outside ECHO)	Emergent (underway and promising, limited to ECHO Network)	Progressing (evident, meaningful and likely to be ongoing, ECHO Network focused)	Significant (evident and substantial, influencing outside the ECHO Network)
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System change condition and ECHO level of contribution	Indicative ECHO outcomes
Policies (minimal on public policy, more influential on regional case partner organisation policy)	<ul style="list-style-type: none"> • Influencing research partners to undertake more holistic impact assessment of resource extraction activity • Influencing thinking, conversations and building relationships that feed into policy contexts
Practices (emergent)	<ul style="list-style-type: none"> • Increased intersectoral collaboration and willingness to collaborate • Shifts from deficit to strengths-based approaches to health impact assessment • Increased valuing and engagement of Indigenous, youth and local communities in health impact assessment • More effectively communicating health impacts and good practice for impact assessment
Resource flows (emergent)	<ul style="list-style-type: none"> • Significant information and knowledge exchange • Career progression, exchanges, secondments, skill development, mentoring, coaching • Funding leveraged (e.g. 33 projects gained external funding) • Mutual learning and capacity strengthening • ECHO influenced teaching curricula in three universities, in addition to the universities of research leads
Relationships (significant)	<ul style="list-style-type: none"> • ECHO has catalysed significant intersectoral relationships, new and ongoing partnerships • Formed and deepened relationships with places/nature • Valuable and rare space to explore complexity • Source of mutual learning and support • Indigenous perspectives becoming more integrated in ECHO-related organisations • New collaborations, projects, research and opportunities
Power dynamics (minimal)	<ul style="list-style-type: none"> • Raising equity, diversity and inclusion (EDI) issues and growing EDI understanding • Making space for Indigenous knowledge and perspectives • Making space for young people to connect with and influence ECHO

System change condition and ECHO level of contribution	Indicative ECHO outcomes
Mindsets (progressing)	<ul style="list-style-type: none"> • Integrative thinking – connecting E-C-H and making holistic health connections • Learning about, valuing and foregrounding Indigenous knowledge and perspectives • Increased willingness to work intersectorally

In this lens, ECHO has contributed most to building relationships and connections for change and influencing mental models, and least in altering power dynamics and policies regarding the health impacts of resource extraction. Some ECHO influence on changing practices and resource flows is emergent. ECHO has identified policy impact as a priority for final ‘knowledge to action’ activities in 2022. Note that some ECHO impacts will be ongoing and some may emerge many years later.



The challenges and opportunities of integrative and intersectoral work

ECHO has highlighted these challenges, opportunities and questions to consider for integrative work. These challenges were known to ECHO at the outset and have proved hard to shift.

Imagining new and different	Default patterns and status quo thinking is strong. In integrative work, ‘unlearning’ and creative thinking is key to change.	<i>How might we imagine different futures together?</i>
Thinking and working in integrative ways	Barriers include sector and knowledge silos, power differentials, differences in expertise and approaches and competing priorities.	<i>How might we grow capacities and practices for integrative thinking and intersectoral working?</i>
Scale, history, power and accountability	The sheer number and scale of social, political and economic issues impacting on ecosystems, people and health is daunting.	<i>How might we navigate our shared history, power dynamics, equity, diversity and inclusion transparently and well together?</i>

Leveraging strengths and managing transitions and change	Knowing and playing to peoples strengths and managing change and transitions can be challenging.	<i>How might strengths and expertise be leveraged across a network? How might transitions, succession and disruption be managed well?</i>
Ability to communicate and influence	Influencing at a decision-making level was challenging for ECHO, as was expanding its integrative thinking approach outside the Network into policy and other settings.	<i>How might research partnerships influence sectors and organisations outside of their sphere of influence?</i>

What enables integrative and intersectoral work?

ECHO has found that these practices enable integrative work.

>>> **Frame intent positively and build evaluation in**

Even in emergent initiatives, intent needs to be clear, framed positively and shared to guide action on specific outcomes and outputs - fuzzy or contested intent wastes time and energy. Evaluation and learning processes should be embedded from the start.

>>> **Prioritise Indigenous, youth and intergenerational engagement**

Resource and make space for Indigenous and intergenerational views, voices and leadership. Support learning about Indigenous perspectives, while striving not to over burden Indigenous individuals and communities in the process. Proactively recruit and work with Indigenous colleagues, young people and support intergenerational engagement.

>>> **Center equity**

Have a proactive strategy to raise and strengthen cultural, linguistic and Equity, Diversity and Inclusion competency - offer training, mentorship, advisory roles and cultural assessments. Resource translation and resource people to engage.

>>> **Nurture authentic relationships, humility and vulnerability**

Invest time in building trusting relationships. Prioritise experiential learning and make time to talk through complex challenges being faced. Embed processes to connect with nature, and each other whether face to face and virtually, including with Indigenous territories (Harris, 2020). Address conflict and tension as it arises, so it doesn't flow out into wider contexts.

>>> **Distributed leadership and skilled facilitation**

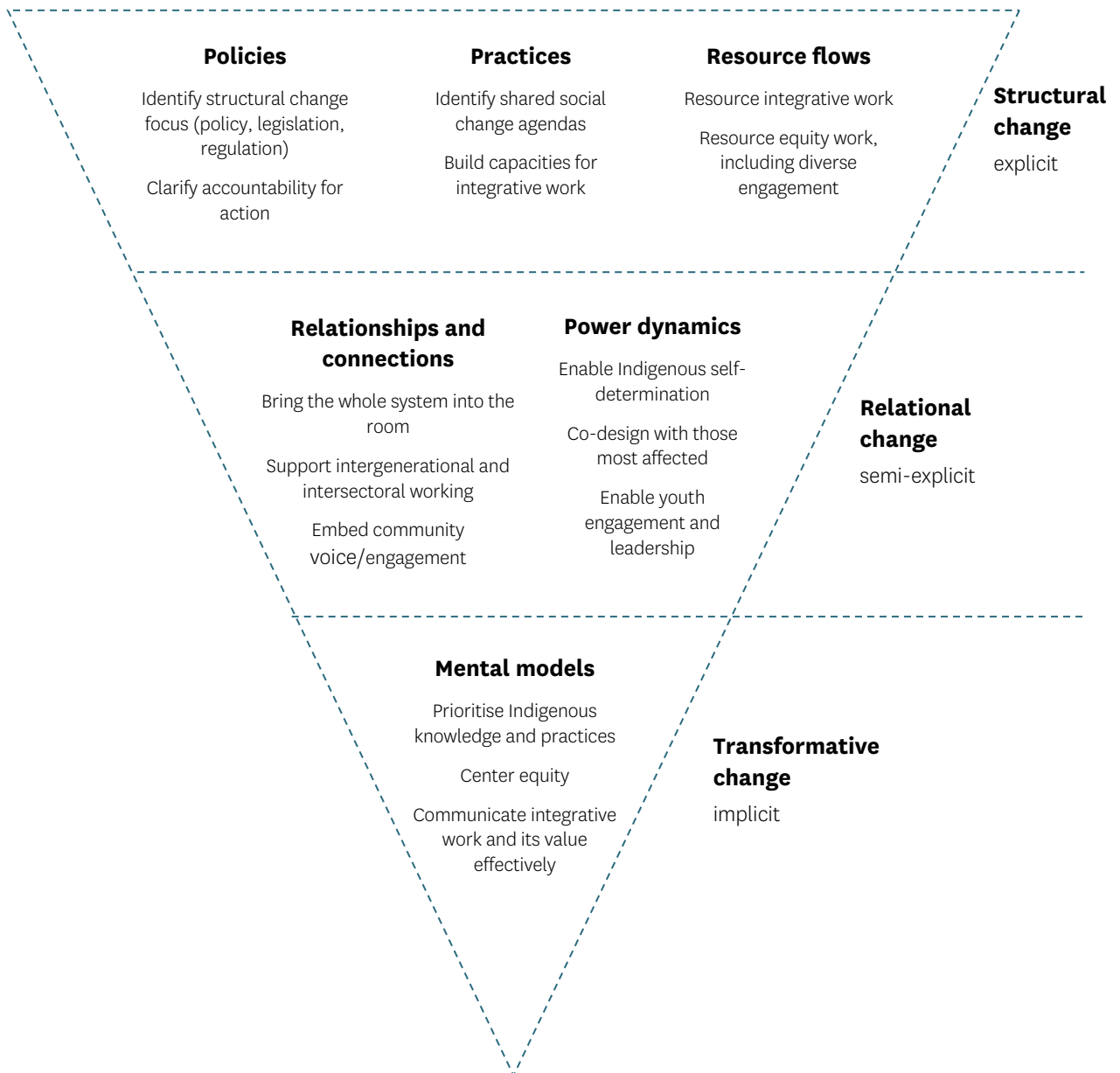
Distributed leadership is needed in complex collaborations to maintain momentum and workflow in a context of busyness, competing priorities and churn. Use experienced facilitators to help navigate tensions and difficult conversations and provide training on how to address tension and conflict constructively. Share examples of what integration looks like and use arts-based, creative approaches to explore, learn about and communicate complex issues.

>>> **Pursue good practice collaboration and collective impact**

Grow capacity and capability to develop good practice collaboration and to work differently and at deeper levels together. Get important things in writing, including expectations.



Continuing with the six conditions of systems change framework, pathways from the ECHO experience to develop further in integrative work are presented below. The primacy of the need to shift mental models and the power of prioritising indigenous knowledge, centering equity and communicating integrative work well are emphasised.



Without initiatives like ECHO that seek to collaborate across sectors and work differently, the status quo endures. The ‘echoes’ of ECHO will continue in the coming years, through the combined efforts of its network members and the ripples of ECHO related work. Ideally, ECHO would be revisited in five to ten years to track what has eventuated over the longer term.

“Good things take time. It is incredibly valuable to invest time and effort in conversations and connections. If we did more of this [integrative work] we would collectively create better futures. We need to bring different views and expertise together”

- Margot Parkes



See below for ECHO-related links and resources and <https://www.echonetwork-reseaecho.ca/resources> to access ECHO publications, including the detailed version of this summary report.

Brisbois, B., Hoogeveen, D., Allison, S., Cole, D., Fyfe, T. M., Harder, H. G., & Parkes, M. W. (2021). Storylines of research on resource extraction and health in Canada: A modified metanarrative synthesis. *Social Science & Medicine*, 277, 113899. <https://doi.org/10.1016/j.socscimed.2021.113899>

Buse, CG., Friberg R, Arnold L and Hanna K. (2020). Unlocking the promise of ‘integrated’ regional and strategic environmental assessments based on a realist review of the scholarly literature. Kelowna BC: Centre for Environmental Assessment Research, University of British Columbia. Online at: https://okcear.sites.olt.ubc.ca/files/2021/10/CEAR_SC_20_1_SSHRC-RSEA-Final-Report_o80520A.pdf.

Buse C, Champaigne B Haara S, Yarmey N, Fumerton R, Parkes MW, (2021). Tips, Tricks and Tools for Tackling Complexity in Social-Ecological Systems: Attending to Cumulative Impacts and Persistent Challenges that Cross-Cut Environmental, Community and Health Systems. ECHO Pulse Day 5. (Nov 26, 2021). <https://www.echonetwork-reseaecho.ca/echo-pulse-resources#Enviroscreen>

De Leeuw, S., Parkes, M. W., Sloan Morgan, O., Christensen, J., Lindsay, N., Mitchell-Foster, K., & Russell Jozkow, J. (2017). Going unscripted: A call to critically engage storytelling methods and methodologies in geography and the medical-health sciences. *The Canadian Geographer/Le Géographe Canadien*, 61(2), 152-164. <https://onlinelibrary.wiley.com/doi/full/10.1111/cag.12337>.

FNHA and OPHO (2021). [First Nations Population Health and Wellness Agenda](https://www.fnha.ca/Documents/FNHA-PHO-First-Nations-Population-Health-and-Wellness-Agenda.pdf). First Nations Health Authority and Office of the Provincial Health Officer <https://www.fnha.ca/Documents/FNHA-PHO-First-Nations-Population-Health-and-Wellness-Agenda.pdf>

Gislason MK, Sloan Morgan O., Mitchell-Foster K, Parkes MW. Voices from the landscape: Storytelling as Gislason, M. K., Sloan Morgan, O., Mitchell-Foster, K., & Parkes, M. W. (2018). Voices from the landscape: Storytelling as emergent counter-narratives and collective action from northern BC Watersheds. *Health & place*, 54, 191-199. <https://pubmed.ncbi.nlm.nih.gov/30321859/>.

Hoogeveen, D., Williams, A., Hussey, A., Western, S., Gislason, M.K. (2021) Sex, mines, and pipe-lines: Examining ‘Gender-based Analysis Plus’ in Canadian impact assessment resource ex-traction policy. *The Extractive Industries and Society*, Volume 8, Issue 3, 2021. <https://doi.org/10.1016/j.exis.2021.100921>.

[Hoogeveen, D., Gislason, M., Hussey, A., Western, S., & Williams, A. \(2020\). Gender Based Analysis Plus: A knowledge synthesis for the implementation and development of socially responsible impact assessment in Canada.](#)

Kania, John, Mark Kramer and Peter Senge. (2018). The Water of Systems Change. FSG.

https://www.fsg.org/publications/water_of_systems_change.

Martin Harris S (2020). Tasdliz Bin. Lakesure Walk. A virtual lakeshore walk in the traditional territory of the Cas Yikh, Gitdimt'ən (Bear) Clan of the Wet'suwet'en, Hazelton, BC. Opening for the 2020 ECHO Network Annual Meeting (Online gathering). <https://www.youtube.com/watch?v=IgiOqZx1Z2w>

Parkes, M.W., Allison, S., Harder, H.G., Hoogeveen, D., Kutzner, D., Aalhus, M., Adams, E., Beck, L., Brisbois, B., Buse, C., Chiasson, A., Cole, D.C., Dolan, S., Fauré, A., Fumerton, R., Gislason, M.K., Hadley, L., Hallström, L.K., Horwitz, P., Marks, R., McKellar, K., Barnes, H.M., Oke, B., Pillsworth, L., Reschny, J., Sanderson, D., Skinner, S., Stelkia, K., Stephen, C., Surette, C., Takaro, T.K., & Vaillancourt, C. (2019) Addressing the Environmental, Community, and Health Impacts of Resource Development: Challenges across Scales, Sectors, and Sites. *Challenges* 10(1): 22, <https://www.mdpi.com/2078-1547/10/1/22>.

Skrlac, M.M, Bates, M., Kennedy, A., Thorne, S., Onabola, C., Doyon, J., McKinnon, T., Cranmer, J., Parkes, M.W. (2022). 2021 ECHO Network Knowledge Exchange Sessions Report. ECHO Network, Prince George, BC. <https://www.echonetwork-reseaecho.ca/echo-pulse-resources>.

Sloan Morgan, O., Hoogeveen, D., Farrales, M., Gislason, M. K., Parkes, M. W., & Harder, H. G. (2020). Resource extraction and intersectoral research: Engaging accountable relations in the Environment Community Health Observatory Network. *Environment and Planning C: Politics and Space*. <https://doi.org/10.1177/2399654420951805>.

Stelkia, K., Beck, L., Manshadi, A., Fisk, A. J., Adams, E., Browne, A. J., Dixon, C., McEachern, D., Ritchie, W., McDonald, S., Henry, B., Marsden, N., Behn-Smith, D., & Reading, J. (2020). Letsemot, "Togetherness": Exploring How Connection to Land, Water, and Territory Influences Health and Wellness with First Nations Knowledge Keepers and Youth in the Fraser Salish Region of British Columbia. *International Journal of Indigenous Health*, 16(2). <https://doi.org/10.32799/ijih.v16i2.33206>

Links and Resources

ECHO Network links

- ECHO Arts based and Narrative approaches <https://www.echonetwork-reseaecho.ca/arts-based-narrative-approaches>
- Comic Jams in partnership with Health Arts Research Centre: <http://healtharts.ca/comic-jams-intersectoral-research-and-responses-to-the-impacts-of-resource-extraction/>
- ECH Expressions in Art" Digital Story: <https://www.youtube.com/watch?v=z8WT-jVGMR8>
- ECHO Network Portal: <http://echo-portal.gis.unbc.ca/>
- [Integrated Regional Profile Guide](#), in partnership with the Cumulative Impacts Research Consortium: <https://www2.unbc.ca/sites/default/files/sections/cumulative-impacts/circintegratedregionalprofileguidefinal.pdf>

- Integrative Assessment Tools: <https://www.echonetwork-reseaeuecho.ca/Integrative-assessment-tools>
- Healing Indicators work, led by Dawn Hoogeveen, in partnership with First Nations Health Authority: <https://www.msfhr.org/1/award/healing-indicators-research-in-indigenous-health-impact-assessment-and-self-determination>
- Regional cases and Emerging Cases: <https://www.echonetwork-reseaeuecho.ca/regional-cases-2>
- Resources: <https://www.echonetwork-reseaeuecho.ca/resources>
- Tools and Processes: <https://www.echonetwork-reseaeuecho.ca/tools-and-processes>
- Youtube channel for ECHO: <https://www.youtube.com/channel/UCITvn4za7JkSVrdcC1FNnvg>.

Knowledge Exchange Partner links:

- Battle River Watershed Alliance: <https://www.battleriverwatershed.ca/>
- Centre for Environmental Assessment Research, University of British Columbia. <https://ok-ear.sites.olt.ubc.ca>
- Cumulative Impacts Research Consortium: <https://www2.unbc.ca/cumulative-impacts/about-circ>
- CoPEH-Canada field course on [Ecosystem Approaches to Health](https://copeh-canada.org/en/key-areas/training-and-capacity-building/course.html): <https://copeh-canada.org/en/key-areas/training-and-capacity-building/course.html>
- First Nations Health Authority, BC Local Environmental Observer Network: <https://www.fnha.ca/what-we-do/environmental-health/bc-leo-network>
- Lake Superior Living Labs Network: <https://livinglabs.lakeheadu.ca/>
- Nechako Watershed Portal: <http://iwrg.gis.unbc.ca/>
- New Brunswick Environmental Network, Risks and Benefits Calculator <https://nben.ca/en/risks-and-benefits>
- Northern Health Authority, Office of Health & Resource Development: <https://www.northernhealth.ca/services/programs/office-health-and-resource-development>.