

Human Well-being, Ecosystem Services and Watershed Management in the Credit River Valley: Web-distributed Mechanisms and Indicators for Communication and Awareness

Principal Investigator – Dr. Martin Bunch, Faculty of Environmental Studies, York University, 2013-2015

Challenge

Human health and well-being is fundamentally dependent on services provided by ecosystems. However, the importance of ecosystem services to human well-being, and of managing ecosystem and watershed resources to maintain such services, is not commonly understood by the public, and not well-enough articulated by environmental management and governance organizations. Beneficiaries of such services are often unaware of the nature of their dependence upon supporting ecosystems. This is particularly true in urbanized watersheds. Watershed management organizations are aware of such benefits to watershed residents, but they very rarely track and report measures of human well-being to demonstrate the efficacy of their work.

Relationships among environmental determinants of health and well-being are multiple, diffuse and interact in complex non-linear ways that are difficult to parse and isolate. This presents a problem for normal science, which reduces problems to smaller components in attempts to understand them. Without a way to demonstrate and communicate these relationships, the ecosystem services that underpin our health and well-being will continue to be ignored and undermined.

Project

This project is a collaborative effort between Credit Valley Conservation(CVC) and York University researchers to identify and communicate health and well-being benefits of watershed natural features and ecosystem processes. The idea is to generate knowledge and awareness about these relationships, and to support watershed management that targets co-benefits: human health and ecosystem health. Researchers have done this by identifying indicators of human well-being associated with ecosystem services, and developing a web-based tool to communicate these indicators for the Credit River Watershed.

Research was also conducted to understand watershed resident and stakeholder opinions about environment and health through the following actions: administered neighbourhood surveys to explore Credit River Watershed residents' perceptions of links between local environments and well-being; surveyed the academic literature, governmental and NGO reports on health-environment relationships; conducted a workshop with governance actors to identify relevant indicators of health-environment relationships; developed a pilot interactive web-site and web-mapping system that demonstrates these well-being – ecosystem services links by connecting specific health benefits to ecosystem/landcover components (while backing that up with scientific evidence, and presenting local data to make it relevant); developed a story-sharing component for the web-mapping system,

which provides a mechanism for watershed residents to share information about personal experiences that link ecosystem services to their well-being.

Outputs

Key outputs include:

- Website (open access) to facilitate watershed residents understanding of environment-health relationships. As part of this project we have developed a pilot interactive web-site and web-mapping system that connects specific health benefits to ecosystem/landcover components (while backing that up with scientific evidence, and presenting local data to make it relevant). <http://cvc.juturna.ca>
- "About Page" on cvc.juturna.ca: "Human Well-Being, Ecosystem Services and Watershed Management in the Credit River Valley." The Credit Valley Watershed and Well-Being Browser is a joint project undertaken by researchers at the Faculty of Environmental Studies at York University in Toronto, Canada and the Credit Valley Conservation Authority.

To disseminate information to end-users, researchers used the following correspondence methods:

- Informational Pamphlet. "Watershed well-being project: An introduction."
- Informational Pamphlet. "Watershed well-being project: An Update."
- Informational Pamphlet. "Project Brief: Well-Being And Your Watershed Linking Health And Well-Being To Ecosystem Services In The Credit River Watershed"

Additionally, this research has been disseminated through several presentations:

- Belaskie, A. "The Role of Conservation in Health Promotion: Investigating Mental Well-Being in the Credit River Watershed." Presented at Water Initiative for the Future (WatIF) 2014.
- Belaskie, A., Mallette, J. "From Watersheds to Well-being: A Preliminary Look at Ecosystem Based Indicators of Well-being and their Applications." Presented at CANSEE 2013.
- Mallette, J. "From Watersheds to Well-being: Ecosystem-based Indicators of Well-being and their Applications." Presented at the CWRA meeting 2014.
- Mallette, J. "From Watersheds to Well-being: Ecosystembased Indicators of Well-being and their Applications." Presented at EcoHealth 2014.
- Bunch, M. "Identifying indicators to represent ecosystem-health relationships in the Credit River watershed." Presented at EcoHealth 2014.
- Harrow, M. "Human well-being, ecosystem services and watershed management in the Credit River Valley: Web-distributed mechanisms and indicators for communication and Awareness." Poster Presentation at EcoHealth 2014.
- Morrison, K. "(Re)-Framing Health in Watersheds: From Environmental Health to Health in Social-Ecological Systems." Organized session at EcoHealth 2014.
- Puddister, M. "Ecohealt Ontario." Presentation at EcoHealth 2014.
- Mallette, J. "Planning for environmental health and social well-being in the Credit River Watershed." Presentation at the A.D. Latornell Conservation Symposium, 2013.

Research team hosted and presented at a series of webinars to mobilize research efforts and work throughout watershed organizations:

- "Watershed Management and Indicators for Human Health." (April 3, 2013). Presentations by: Mike Puddister, Credit Valley Conservation, Tatiana Koveshnikova, Credit Valley Conservation, Dr. Lorna Medd, Cowichan Watershed Board, Steve Litke, Fraser Basin Council, Dr. Margot Parkes, UNBC and Network for Ecosystem Services and Health.
- Canadian Sustainability Indicators Network Webinar: "Watershed and Human Health Indicators: Case studies from the Fraser Basin (British Columbia) and Credit River (Ontario)." (March 23, 2015). Recording available at: <http://www.iisd.org/video/watershed-and-human-health-indicators-case-studies-fraser-basin-and-credit-river>

This research has resulted in scholarly journal publications and end-user reports:

- Belaskie, A. "Role of the Environment in Mental Health Promotion: Investigating Mental Well-Being in the Credit River Watershed." Master's research paper.
- Mallette, J. "Planning for ecological health and human well-being in the Credit River Watershed: Social well-being benefits of urban natural features and areas." Master's research paper.

Outcomes

Outcomes include:

- This project has led to the establishment of a Memorandum of Understanding (MOU) between York and CVC to promote and guide continued and additional collaborative research demonstrating strengthened relationships with partners. The MOU is intended to set a framework for the next five years for collaborative research, including a second phase of this project. It will also accommodate the funding of research by the CVC, and hosting of York students as interns at CVC.
- The project evolved alongside the emergence of the Ecohealth Ontario collaborative - a group of mostly conservation and public health practitioners in Southern Ontario that look to manage environment for co-benefits. Participation in this project has influenced some of the research team to become involved with Ecohealth Ontario's research working group. This is leading both to a network of researchers and practitioners interested in ecohealth and to further research in this area in the GTA.
- Increased opportunities for future research by creating a network of researchers and graduate students interested in operationalizing the idea of watersheds as settings for human health and well-being. This project has engaged the core team, as well as new researchers who received funding for a related project, thus expanding this project's scope and network. Already the project has contributed to collaborations on projects with similar objectives and technology in the Nechacko River Watershed in British Columbia, and the Peñas Blancas watershed in Costa Rica.
- The interactive mapping system developed as part of this project has been built as Free and Open Sources Software and is released under the GNU General Public License version 3. This offers cost savings, as it is available for free to other watershed organizations that might want to adopt it.

- **Increased Knowledge.** This project addresses a topic of interest to watershed professionals and the public in a number of jurisdictions - namely the link between watershed governance and public health and wellbeing. The findings will inform work by other groups, as well as by other researchers interested in the environment-health nexus. The practical application of these ideas and their integration into a publically accessible web-distributed GIS tool are unique and generating new knowledge.

Research Team and Partners:

Research Team:

Dr. Martin Bunch, York University

Dr. Karen Morrison, York University

Partners:

Credit Valley Conservation Authority

York University

Highly Qualified Personnel (HQP):

Julie Mallette, Masters

Alexandra Belaskie, Masters

Mitch Harrow, Masters

Iftekhar Ahmed, Masters

Elizabeth Paudel, Masters

Connor Allaby, Masters

Patrick Amaral, Masters

Aleksandra Lepiarka, Masters

Jessica Abrahamse, Masters

Alvaro Palazuelos, PhD

Marta Berbes, PhD