KNOWLEDGE TRANSLATION CHALLENGES AND SOLUTIONS DESCRIBED BY RESEARCHERS

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Introduction

A series of focus group sessions were conducted with researchers from a selection of Canadian universities, government departments and agencies that have engaged in knowledge translation activities. The purpose of these focus groups was to assess the challenges that researchers encounter when doing knowledge translation, as well as possible solutions to these challenges, with the eventual goal of developing tools or processes that might facilitate knowledge translation. It is important to note that the challenges summarized below reflect primarily the opinion of researchers and do not address the corresponding challenges encountered by end users who engage in this process. A second phase of the project explored related issues from end users' perspectives, and this report is publically available online at http://www.cwn-rce.ca/publications/knowledge-translation/advice-from-research-users-on-facilitating-research-partnerships/.

A Few Definitions…

"Knowledge translation" can be defined as the process of linking between individuals who use research to make decisions and researchers. This process has been called by various names, including knowledge translation, knowledge brokering, knowledge exchange, knowledge transfer, and knowledge mobilization, in addition to the all-inclusive term K*. In this study, we use the term knowledge translation to refer to all of the activities through which end users of research (policy-makers and practitioners) are involved in the research process, from design through to dissemination. A diagram that represents various ways in which knowledge translation can be incorporated into the research process can be found in Appendix A.

The term "end users" refers to those who make decisions informed by the results of research. This group might include policy-makers, municipalities, water managers, conservation authorities or members of industry, along with others. "Stakeholder" is a broader term that includes end users as well as those who have an interest in the research, but may not directly use the results.

Method

Selecting Participants

Only researchers who had previously been involved in knowledge translation and brokering work were included in the focus groups because they had experienced the challenges and could best speak to potential solutions.

Two methods were used to identify researchers who might participate in these focus groups. First, CWN staff and other knowledge translation professionals identified a number of researchers in academia and in government departments who had done knowledge translation. Second, these researchers were asked to help identify other researchers in the areas of water, agriculture and environment with experience in knowledge translation. Through this snowball sampling process an initial list of 98 potential participants was generated. Additionally, members of CWN's Students and Young Professionals (SYP) Committee were asked to participate in a focus group to ensure that the perspective of junior researchers was also captured. All potential participants were contacted via email, provided with an overview of the study, and asked to participate in a focus group in their region. Forty-eight researchers agreed to participate; the other researchers either could not participate because of other commitments or did not respond. The final list of interviewees consisted of 11 students and young professionals from

CWN's SYP Committee, 8 participants from government departments and agencies, and 29 researchers from academic institutions. See Appendix B for a list of participants.

Focus Groups

After agreeing to participate, participants were provided with background information about the study. Nine semi-structured focus group sessions, each approximately 2 to 2.5 hours long, were conducted with participants in various cities across Canada. The size of the focus groups ranged from 2 to 11 participants, but on average focus groups consisted of 5 participants. Four participants were interviewed individually instead of in focus groups because of scheduling difficulties.

The focus group sessions began with a discussion about CWN's definition of knowledge translation to ensure that all participants understood the terminology. Additional questions focused on participants' experiences doing knowledge translation and the challenges they had encountered. Within each group, participants were then asked to select their most significant challenges, and to discuss potential solutions to them. See Appendix A for the list of questions.

Data Analysis

Each focus group session was recorded and transcribed, and the transcriptions were qualitatively analyzed. Responses were reviewed and categorized, and the results of this analysis can be found below. All items included in this document were mentioned by at least two participants; items that were never mentioned more than once were omitted for brevity.

Challenges

Challenge: Building a Mutual Understanding

Building Mutual Trust

Researchers found that building trust with end users can be a challenge because it takes a long time to develop trust and mutual understanding. End users may believe that academics do not understand or value practical problems or they may have had negative experiences working with researchers who did not deliver the agreed-upon product. This may make it difficult for them to trust that collaborating with researchers will benefit their organization. Similarly, researchers may need to learn to trust end users and to build a strong relationship before engaging in a collaborative project.

> *"I think trust can be a barrier. It takes a long time to develop trust with the end user."* – Karen Kidd

Finding a Common Language

Researchers and end users must learn to speak a common language, as they often come from different backgrounds and use different terminology. Furthermore, it can be difficult for researchers to understand how to make complex technical information easily understandable if they are working with an end user who does not have a technical background.

Determining, Defining and Balancing Priorities

One of the most difficult aspects of knowledge translation is determining and understanding what an end user's needs and priorities are, and ensuring that the research program and the final product will meet those needs. This

> *"One of the key challenges that researchers face when trying to meet the needs of end users is that end users don't always define their needs well… it's not that they don't know what their needs are, but rather they may articulate one need or target without having an adequate opportunity to affirm the relevance and related constraints of that need in their broader context."*
> – Monica Emelko

becomes even more difficult to achieve when the (sometimes conflicting) needs of multiple end users must be balanced. In addition to balancing end-user priorities, researchers must also ensure that their own needs (and the needs of their students) are still met. Researchers found this compromise between end-user and researcher needs can be difficult to achieve, but they stressed that this process should be done at the beginning of a project, although it may be time-consuming and difficult. However, it may also be difficult to define the needs of an end user, as potential end users may be diverse and have different needs, or their needs may be constantly changing.

Defining the Research Question

Once the researcher understands the end user's needs and priorities, the next challenge is defining those needs as a research question. Often an end user's problem will need to be reframed as a research question, while also ensuring that the emerging research plan remains directly applicable to the question the end user needs answered.

> *"There is a misconception about the questions that [end users] think are research relevant. When I think about a problem, I think about it from a very different perspective than the end user might."* – Diana Allen

End User Understanding of Research

End users may not understand how the research process works – for example, they may not be aware that a student must produce a thesis over the course of the research, or that a professor needs funding or a publication. Another challenge is that end users have difficulty understanding uncertainty in research – they may have the perception that science is communicating absolute truths, while researchers always qualify their answers. This misunderstanding can be a challenge and requires the researcher to educate the end user about the limitations of research.

> *"You can't explain the entire scientific process but how do you make it easier for a policy person to understand… what science can and cannot tell us."* – Pamela Joosse

Researcher Understanding of Policy/Practice

Another challenge is that researchers often do not have a good understanding of how decisions are made in policy and practice. They may not recognize that science is only one influencer of decisions, or that making use of research information can be a long and difficult process for end-user organizations. Researchers may also have difficulty accepting that the line of research they are interested in pursuing may not be a priority for end users.

Changing Priorities

End-user priorities and interest in a project may also change – especially when dealing with a government agency, whose priorities are dictated by policies that may change. Reductions in partner funding may also change the scope of the project, or partners may withdraw funding if the project is no longer of interest to them. Another difficulty can surface when researchers are not interested in pursuing a research topic that end users need an answer to.

> *"Throughout the project priorities and interests can change… it takes a lot of effort to build up the communication channels."* – Anonymous

Challenge: Networking

Building Networks of End Users

One of the major challenges participants face is difficulty networking and connecting with potential end users. Researchers find that it is difficult to know where to find the right partner, to know who might be the best partner

> *"It can be very difficult to find other people who are interested in the same things as you – particularly in a new growth area where you may not have pre-existing relationships to tap into."* – Ian Campbell

for them, and to know what person to engage with at the end-user organization. Furthermore, creating partnerships with end users often depends on knowing the right people, which can make it difficult to break into a new group – especially given that informal relationship-building opportunities are rare and that it is difficult to get end users to attend meetings.

Interdisciplinary Networking: Integration Between Silos

Another challenge in knowledge translation is that researchers often work exclusively in their specific discipline. This means that many researchers do not have colleagues they can consult outside their discipline, and very few projects that examine an issue from multiple perspectives because many researchers do not engage in interdisciplinary work. End users then experience difficulty because they have to integrate information from many different disciplines (engineering, ecology, economics, etc.) and in the process may reveal unanswered questions that render the information unusable.

> *"[Governments] are concerned with a holistic issue from many different perspectives, and [researchers] are very narrow in our perspective. That's an enormous challenge for [governments] because water also involves economic, health, and cultural issues."* – Steven Renzetti

Building International Partnerships

A few researchers also mentioned that it is difficult to build relationships with partners and end users internationally. Participants feel that little international research collaboration is being done, and few mechanisms to encourage international collaboration are currently in place. This can be detrimental for researchers because they do not have the opportunity to build networks with top-tier researchers in other countries.

Finding Support Personnel

Researchers experienced difficulty finding research assistants, project managers, knowledge translation specialists or other support personnel with the skills necessary to conduct end-user oriented, multidisciplinary research.

Challenge: Knowledge Translation Skills and Ability

Researchers often have little experience or training in doing knowledge translation. Participants feel that they lack information about what knowledge translation is or how to do it well, and attribute this to a lack of training in plain language writing, communications, conflict management, interpersonal and marketing skills. Furthermore, some researchers may lack the confidence or credibility to engage with end users, while others may simply be less adept at expressing their research knowledge in plain language. Although this is slowly changing, some researchers believe that knowledge translation is not important or worth the risks. Finally, some participants in the study wondered if an academic's role should be to translate knowledge or if this might be better suited to another person with training and more relevant skills.

> *"Not everyone has the skills to do this kind of work… and a person who is very technical probably doesn't have any interest in knowledge translation."* – Anonymous

Challenge: Time

Several participants noted that finding the time to do knowledge translation is a major challenge. It is time consuming to engage with end users at the beginning of a project and to create end-user oriented products in addition to peer-reviewed publications, especially given the many

> *"If I had more time I could do knowledge translation much better… Researchers have to do much more than just researching."*
> – Katy Haralampides

competing demands on their time, and it is often a low priority for academic researchers because this work is often not recognized by the university reward system. Also, given the number of people involved in a collaborative research project, it can be a major challenge to find time for all parties to meet.

Another challenge participants experience is that researchers and end users often have different timelines; researchers are interested in a long-term research project and must train students over the its course, but end users often have a crisis that needs addressing within a shorter time frame. Furthermore, collaborative projects may take significant time to develop because building relationships and establishing trust may take many years.

> *"Often, the people who really could and should benefit from the research find that it takes too long to get the research done."* – Graham Daborn

Challenge: Uncertainty Around the Use of Research

A major concern raised by participants is that giving research information to end users may result in the research being applied incorrectly. After dissemination, research may be over-generalized because other parties do not understand its limitations. There is also a danger that by oversimplifying the research to make it practical, scientific accuracy will be lost; research will simply be reduced to "sound bites." Additionally, there is also a risk that being too accommodating of end-user needs may be detrimental to research rigor or student training. Researchers were concerned that the research being disseminated may not be subject to peer review or validation, and therefore may be used improperly before it has been reviewed. Researchers also asserted that although knowledge translation is not appropriate for all types of research (i.e. basic research), these types of research are still important and should continue to receive funding.

> *"I think we have to accept that if we are going to hand off the data to somebody else to make use of, they aren't going to necessarily use them in the same way or with the same rigor we want them to be used."*
> – Anonymous

Challenge: Funding

Availability and Allocation

Securing research funding, especially funding that includes a knowledge translation component, is another challenge that participants experienced. As always, funding can be difficult to secure because there are limited sources that fund research, and finding appropriate sources of funding can be time consuming. Furthermore, allocating funding specifically for knowledge translation is also a challenge – researchers often under-allocate money for knowledge translation in their budget or run out of money and time before the end of the funding cycle. The result may be that knowledge translation must be done off the side of the researcher's desk, which limits end-user participation in the project and restricts communication of the research. Furthermore, building relationships with end users is time consuming, for which any funding is rarely allocated, even though end-user input may greatly change the funding proposal.

> *"Research always costs more than you anticipate and we generally don't set aside sufficient resources – either financial or human – to effect the knowledge translation portion of the project."* – Graham Daborn

Among non-academic researchers, the opposite problem may exist – funding may be available to involve the targeted end user throughout the research, but time or funding may not be available for these researchers to share this information with other academics through conferences and articles.

Lack of Consistent, Long-Term Funding

Another challenge is that funding cycles are short-term; funders may only provide 1 to 5 years of consistent funding, which can lead to a disjointed program of research. Similarly, end users are often not interested in funding long-term data collection; they want results that are applicable in the short term. Furthermore, funding is not stable and changes from year to year, making it difficult for researchers to develop a consistent research plan.

> *"Funding cycles are for three years and research usually takes until the end to get finished…Funding cycles are generally too short to include data review/analysis and dissemination."* – Michèle Giddings

Challenge: Incentives or Rewards for Knowledge Translation

One major challenge identified by researchers is that, at most universities, there is no incentive or reward for knowledge translation. Promotion and tenure decisions are made based on journal publications and presentations, as well as teaching, but knowledge translation is rarely recognized or rewarded. Furthermore, because knowledge translation is time consuming, it may be detrimental to the career of young, untenured researchers to engage in these activities. Additionally, funding agencies may not hold knowledge translation activities in high esteem when awarding grants to researchers, and thus researchers who engage in knowledge translation may experience difficulties obtaining grant money.

> *"One of the barriers is… what we use as metrics of achievement for tenure and promotion. Knowledge translation does not fall into those metrics."* – Sarah Dorner

Challenge: Evaluating Success

Another challenge researchers experienced is a lack of knowledge about how to evaluate the success of their knowledge translation efforts. Researchers were unsure how to formally evaluate their knowledge translation work, what questions to ask, or who should do the evaluation. This inability to clearly demonstrate any return on investment of their knowledge translation efforts is also detrimental when researchers are trying to demonstrate the value of their efforts for promotion or funding purposes. Additionally, evaluating impact may take a long time (there might be no impact until several years after the project) and evaluating the results of one research project (instead of a program or body of research) might be impossible. It is also difficult to define success, which might range from simply forming a relationship to influencing a policy.

> *"Most projects lack any feedback on the impact of the knowledge from both sides – from the researcher side and the end-user side… and there are a lot of projects where the project might not be successful for a long time."* – William Annable

Challenge: Confidentiality, Data Ownership and IP

Another difficulty that participants experienced was related to concerns of their end users regarding confidentiality of the results and data. Some end users may be unwilling or uninterested in having research results made publically available, which may limit researchers' ability to publish their findings. Similarly, coming to an agreement about ownership of the data was also a challenge. Another concern was academic freedom: when end users were very heavily involved in the project the researcher's independence might be questioned. Finally, researchers also encountered challenges when they were determining how to disseminate research that might be critical of their end user or the organization that employs them.

Challenge: Special Considerations When Working with Governments

Researchers often must take into account special considerations when working with governments. First, additional internal review processes may be required, increasing the time before information can be released. Coordinating multiple review processes when more than one government agency is involved may add additional layers of complexity to the public release of information. Participants who worked for government agencies also found that the review process sometimes affected the amount of information they were able to release to the media. Second, research or dissemination done in partnership with government agencies may need to be released in both French and English, so translation must be accounted for in timelines and budgets. Additionally, legislation can also affect uptake of the research results by end users because it affects end-user priorities and actions such that end users will be less likely to take action if they are not mandated to do so; however, the process of changing legislation is extremely time consuming and difficult.

Challenge: Loss of "Institutional Knowledge" and Turnover

Loss of knowledge because of retirement and turnover of both end users and researchers is a major challenge that participants experienced. Turnover among end users is difficult because researchers often spend a significant amount of time building relationships with them, only to have it disappear when their contact retires or leaves the organization. In addition to losing the connection, the researcher may have spent time building the end user's specialized research knowledge and capacity, which is also lost when they leave the organization.

> *"So much knowledge is in the heads of the people who deal with it, but once that person is gone the knowledge is gone."* – Anonymous

Retirement and turnover of researchers is another challenge, mainly because researchers' implicit or institutional knowledge may be lost when they retire. Many types of implicit knowledge are lost, including subject matter expertise, knowledge of existing unpublished research (which might help a researcher to avoid duplicating this existing research), knowledge of existing reports and their location, knowledge of current research, and the loss of relationships. This loss of knowledge may be further compounded because there is no systematic synthesis of past, ongoing and unpublished research from both academia and government, and the only place this information exists is in researchers' heads.

> *"There's a lot of research that people have done and it's lost. I go through the files of someone who's retired and I find that I'm doing the same research all over again."*
> – Anonymous

Challenge: Public and Media Outreach

It is often difficult for researchers to communicate with the public and the media; however, without public attention being paid to issues of concern, it may be difficult to attract end-user attention to these issues. The general public may not have a strong awareness of water issues or a strong understanding of why research is important to the community. Some participants believe that there is unmet demand from the public for more outreach and information on water – perhaps in the form of public lectures or newspaper articles. However, outreach by researchers to media is currently rare, as they may find it difficult to communicate directly with the media or the public. Additionally, the capacity within the media for science reporting is also inadequate.

Potential Solutions

After discussing the knowledge translations challenges they had encountered, researchers spoke about potential solutions that would help to mitigate the key difficulties. Researchers' thoughts on potential

solutions are summarized below, as well as recommendations that are derived from researcher comments and informed by CWN staff knowledge of related activities at CWN.

Solution: Collaboration and Discussion

Many researchers stressed that full collaboration and honest communication with end users at the beginning of the project is essential to its overall success. Communication at this stage should encourage both parties to discuss their priorities and needs and to come to an understanding about the goals, processes and outputs of the research project. Extensive interaction will help researchers understand the policy cycle and will help end users understand the research process. An online community of practice or a forum might also help researchers to network with end users, as well as with researchers from other disciplines.

> *"You can build knowledge translation into a project by collaborating the whole way though… this forces people to get out of their silos and jargon, and forces people to be explicit with their uncertainties."* – Tom Nudds

Recommendations: CWN should continue to provide opportunities for end users and researchers to interact, as this may be the most effective tool to increase mutual understanding. CWN's Knowledge Translation Tool Kit encourages researchers to think about various topics to discuss with their end user. However, it may be valuable to develop a more concise resource that could be used to frame initial conversations.

> *"You need to get the end user involved at the beginning. We try to figure out what they really need, what problems they have and what are the potential solutions."* – Hongde Zhou

Solution: Knowledge Broker

Researchers were split on what the best solution to their lack of knowledge about knowledge translation should be. Some believed that researchers should be the ones doing knowledge translation and the goal should be training to help them do it better (for further information, see next section), and some believed that a knowledge broker or intermediary should be assisting with the knowledge translation component.

> *"You need a person with very good communication skills, good public relations skills – if I don't have those skills, I won't be very successful anyway."* – Hans Schreier

The participants who wanted a knowledge broker to assist them felt that they did not have the skills to do knowledge translation effectively, and thus felt that a person in-house at CWN who had the appropriate skills, as well as some content knowledge, would be better suited to bridge the gap between researchers and end users. This person could assist the researcher with communications and plain language writing, tool development, event and workshop planning, as well as provide website support.

> *"Scientists may be very good at doing science, but not at speaking in public. Or there are people who are good communicators but not great scientists. Having a broker – someone who has ability or training – might be a solution."* – Simon Courtenay

Recommendations: If CWN decides to further embrace a knowledge brokering role, having staff in-house who can take on this function may be a path to consider.

Solution: Training

Some researchers believed that instead of having a knowledge broker assist them with knowledge translation, it would be preferable if they translated knowledge directly but learned to do it better. These researchers thought that the most beneficial opportunity would be a workshop or training

module focusing on communications strategies (perhaps with feedback from journalists), novel technologies and methods of communication, interpersonal skills and conflict resolution, and research on effective methods of knowledge translation. Such a workshop should be easily accessible and relatively short; piggybacking it onto another workshop might make it easier for researchers to attend. Researchers felt strongly that providing this training to students should be a priority (potentially as part of their graduate curriculum), as it will help the next generation to develop their knowledge translation skills. Simply observing good speakers and good writers may also be beneficial to the improvement of knowledge translation skills.

> *"The best training I've had for knowledge translation is in media training courses – working with journalists and getting feedback from them on … the best way to translate my scientific jargon into everyday language."* – Karen Kidd

Recommendations: CWN is in the process of exploring training development programs. These results suggest that a training program in knowledge translation may be beneficial, but it should be easily accessible (potentially online or piggybacked onto an existing workshop) and short. Knowledge translation training might also be run in collaboration with a graduate studies program.

Solution: Success Stories

Participants wanted to see case studies that gave examples of successful knowledge translation. Success stories would serve the dual purpose of educating researchers about past knowledge translation strategies that have been successful and providing examples of evaluation metrics that may help the researcher with evaluation of their own project. Visuals and stories are also interesting to read and may take little of the researcher's time, which may encourage them to use these resources. An additional suggestion is that CWN implement an award for superior knowledge translation work, and winners of this award could be featured as success stories on the website.

> *"It would be useful to have examples of success stories and examples of innovative knowledge translation because I think we are lost about what we can actually do."*
> – Natalie Prystajecky

Recommendations: Several case studies are currently under development at CWN. It may be valuable to make these case studies publically available online as a resource for researchers.

Solution: Knowledge Translation Grants

Participants suggested various changes that could be made to grant requirements that would make it easier for them to do knowledge translation. Researchers suggested that a separate knowledge translation fund, to be applied for after completing the research, would help them to do better dissemination. Additionally, providing funding for students to do knowledge translation by assisting the primary researcher would also help with student training. Researchers also would like to be able to allocate more money to knowledge translation (specifically to preliminary relationship-building and dissemination activities) in their proposal, or to have a flexible "slush fund" within the budget that could be used for knowledge translation.

> *"Something the CWN could do is take students and give them money to do a translation… [this] starts right at the grad level the idea that people need to think beyond a thesis."*
> – Hans Schreier

Recommendations: CWN currently does provide some funding at the proposal stage through funding calls within its research consortia, but these results suggest that CWN could also consider implementing a small after-grant fund opportunity to be used for dissemination activities. Researchers should also be

encouraged to set aside money for knowledge translation activities (partner meetings, dissemination activities) in their research budget.

Solution: Match-making

Several researchers mentioned that they would like CWN to play more of a match-making role, connecting end users who need research done with researchers who may be able to assist with this need, perhaps even making international connections. Multiple participants also expressed the desire for an online forum or community of practice where multidisciplinary researchers can talk to each other and to end users. Participants also mentioned that they would like more informal relationship-building opportunities to be available.

Recommendations: CWN is currently filling this match-making role through its matching forum and consortia programs. Additional work in this area, as well as more marketing to raise awareness of this work, may be beneficial.

Solution: Evaluation Guidelines

Researchers would also like more information on how to properly evaluate their knowledge translation work. Information on what kinds of impact they should be evaluating, metrics and questions they can use to evaluate the impact of the research (especially social and engagement metrics) and examples of evaluation would be useful.

> *"Information on what has been done in evaluation would be helpful – like a toolbox with information on all the different ways to evaluate impact."*
> – Marie-Hélène Thériault

Recommendations: A resource that details how to evaluate impact, some potential metrics to use, and concrete examples may be a valuable tool for researchers.

Solution: Identify Key Targets and their Priorities

Researchers found it useful to identify key end users who should be involved with their research, including end users who have the ability to make desired changes, individuals who decision-makers listen to, and targets who could act as 'champions' of the research. Once these key individuals have been identified, researchers can then identify what knowledge these end users need, what their long-term knowledge needs are and what their preferred method of communication is.

> *"Have people on board from government agencies who will act as champions, and who will promote what the researchers are doing."*
> – Caetano Dorea

Recommendations: CWN is currently compiling a list of key opinion leaders in water. However, CWN may want to consider providing assistance to researchers as they compile their own project-specific key contacts, or encouraging the development of such a list.

Solution: Make Knowledge Translation a Requirement

To encourage more researchers to do knowledge translation, funding agencies could simply make knowledge translation a mandatory requirement. Funding agencies should require that research be multidisciplinary and that partners be included from the beginning of a project, especially at the proposal stage. The proposal should clearly describe what knowledge translation the funder expects, and allow ample space in the proposal so the researcher can describe his/her knowledge translation plan.

Recommendation: Interdisciplinary, end-user oriented research is already required at CWN, but allowing more space in proposals for researchers to describe their knowledge translation plan may demonstrate how highly CWN values knowledge translation.

Solution: Education

Some participants also believe that education of researchers and end users is necessary. Academics might benefit from training that could help them to gain a better understanding of the policy cycle and of the importance of knowledge translation. Additionally, it may be beneficial for some end users to be trained to better understand the research cycle, which may help them to embrace uncertainty around research conclusions. One suggested mechanism was a mentorship program where academics act as mentors to government agencies, which would increase both the research capacity of the end user and the understanding of the researcher.

Recommendations: It may be beneficial for CWN to create educational resources targeted at both end users and researchers that would provide clarification about the context in which each party operates, although this information may also be conveyed simply though extensive interaction between parties.

Solution: Summary Publication

To combat the challenge of loss of knowledge because of retirement and turnover, researchers suggested that a publication summarizing past projects (and potentially those under development) funded by CWN would be helpful so that they could be aware of what research has already been done. This could be a recurring publication every few years to summarize what CWN has funded and direct readers to the original publication.

Recommendations: Summaries of all CWN-funded projects can be found on CWN's website, but an electronic document that integrates this information, makes it searchable, and summarizes the key messages in an easily accessible format may be valuable.

Solution: Mentoring Program

> *"I think CWN could help facilitate knowledge translation by having people who are new to the research game work with more established researchers."* – Anonymous

Several researchers suggested that a mentoring program or informal collaboration between junior and senior researchers might be an effective way of exposing junior researchers and students to end users and helping them to build relationships. By allowing junior faculty to observe a more experienced researcher interacting with end users, junior researchers may gain a better understanding of the end user's needs and perspective, and they can capitalize on the pre-existing relationship between the researcher and end user.

Recommendations: Although senior and junior researchers may work together informally through the consortia or various research projects, CWN may want to consider requiring that both senior and junior researchers be involved in a project, or implementing a mentorship program.

Solution: Public Outreach

Some focus group participants believe that public outreach and awareness are necessary, because public attention to an issue motivates end-user action. For this reason, they think it is important that more public education be done about water – whether through an online webinar, weekly newspaper column, public lecture or student education program. Communicating the importance of research to the community may help to put pressure on universities to modify the incentive and reward system as well.

Recommendations: Public outreach and education does not fall within CWN's mandate, but these results suggest the need for an organization to do more public education about water and to demonstrate how water research can benefit the community.

Solution: Media Education

Some researchers believe that more contact with the media will help to strengthen the media's capacity for science reporting. To this end, researchers believe that it would be helpful for a central body like CWN to cultivate relationships with members of the media.

> *"If you look at the capacity in Canadian journalism, there are a very small number of journalists writing about science and environment."*
> – Steven Renzetti

Recommendations: CWN's current practice of working collaboratively with media may help to increase media capacity for science reporting. Additionally, it might be a future option for CWN to sponsor or direct media to capacity-building opportunities.

Solution: Database of Researchers

Participants thought that a database or list of multidisciplinary researchers whose work touched on water issues would help them to identify other researchers who they might be able to consult or collaborate with. A database with searchable key words would be especially helpful.

Recommendations: CWN is currently investigating the feasibility of developing a database of researchers from various subfields in water. If this idea proves viable, it might also be made publicly available online; however, it may be difficult for CWN to maintain up-to-date contact information for all researchers.

Solution: Regional Nodes

Some researchers felt that the issue of discipline isolation could be solved by holding smaller, regional meetings or conferences where researchers could meet and discuss research. These could also be a forum for researchers to interact with local end users.

Recommendations: Although CWN hosts a national conference biannually, it may be of additional benefit to host multidisciplinary meetings, lectures or networking opportunities at a regional level.

Appendix A: Focus Group Questions

Definitions

End User. An end user will directly use the results of the research you produce.

Knowledge Translation. The process of making research relevant, accessible and available to end users and partners is knowledge translation. Figure 1 (below) shows how knowledge translation activities (examples given in the orange boxes) can be incorporated into every stage of the research process.

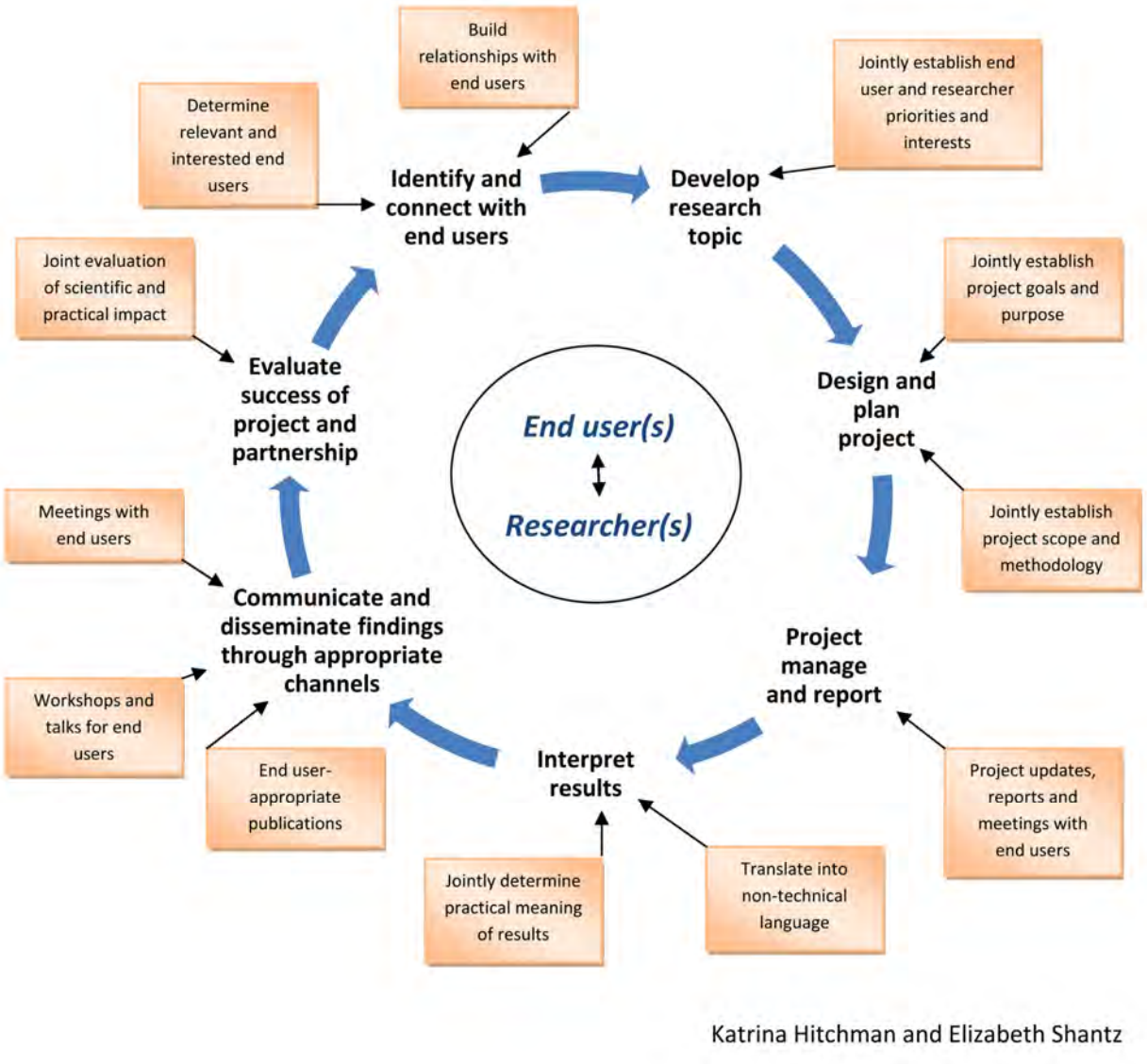

Figure 1: Knowledge Translation in the Research Cycle

Is this model an accurate representation of your experience with knowledge translation?

- Is there anything you would like to add to this model?

Please briefly describe which components of knowledge translation you have been involved in.

Challenges of Knowledge Translation

What challenges or difficulties have you faced in your own knowledge translation work?

- *List is compiled on a flip chart.*
- *Optional prompts*:
    - What challenges did you face at the beginning of your career?
    - What challenges do you face at the present time?
    - What challenges have your colleagues encountered that may have kept them from becoming involved in knowledge translation?

Solutions to the Challenges

Please choose the top 3-5 most significant barriers from this list.

- *Participants vote on the most significant barriers; the 3-5 most popular barriers are chosen to discuss potential solutions.*

What would help you to overcome each of these barriers?

Additional Topics:

These questions were asked only if time allowed.

What tools or supports have you used in the past that helped to facilitate your knowledge translation work?

Why did you originally become involved in knowledge translation?

Appendix B: Acknowledgements

The Canadian Water Network thanks the following individuals for their generous contribution of time, expertise and experiences, which were invaluable in preparing this document.

Name	Affiliation	Focus Group Region
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Kerry Black	Students and Young Professionals Committee	Saint Andrews
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Caetano Dorea	Université Laval	Quebec City
Sarah Dorner	Polytechnique Montréal	Individual Interview
Gemma Dunn	University of British Columbia	Vancouver
Michael English	Wilfrid Laurier University	Waterloo
Monica Emelko	University of Waterloo	Individual Interview
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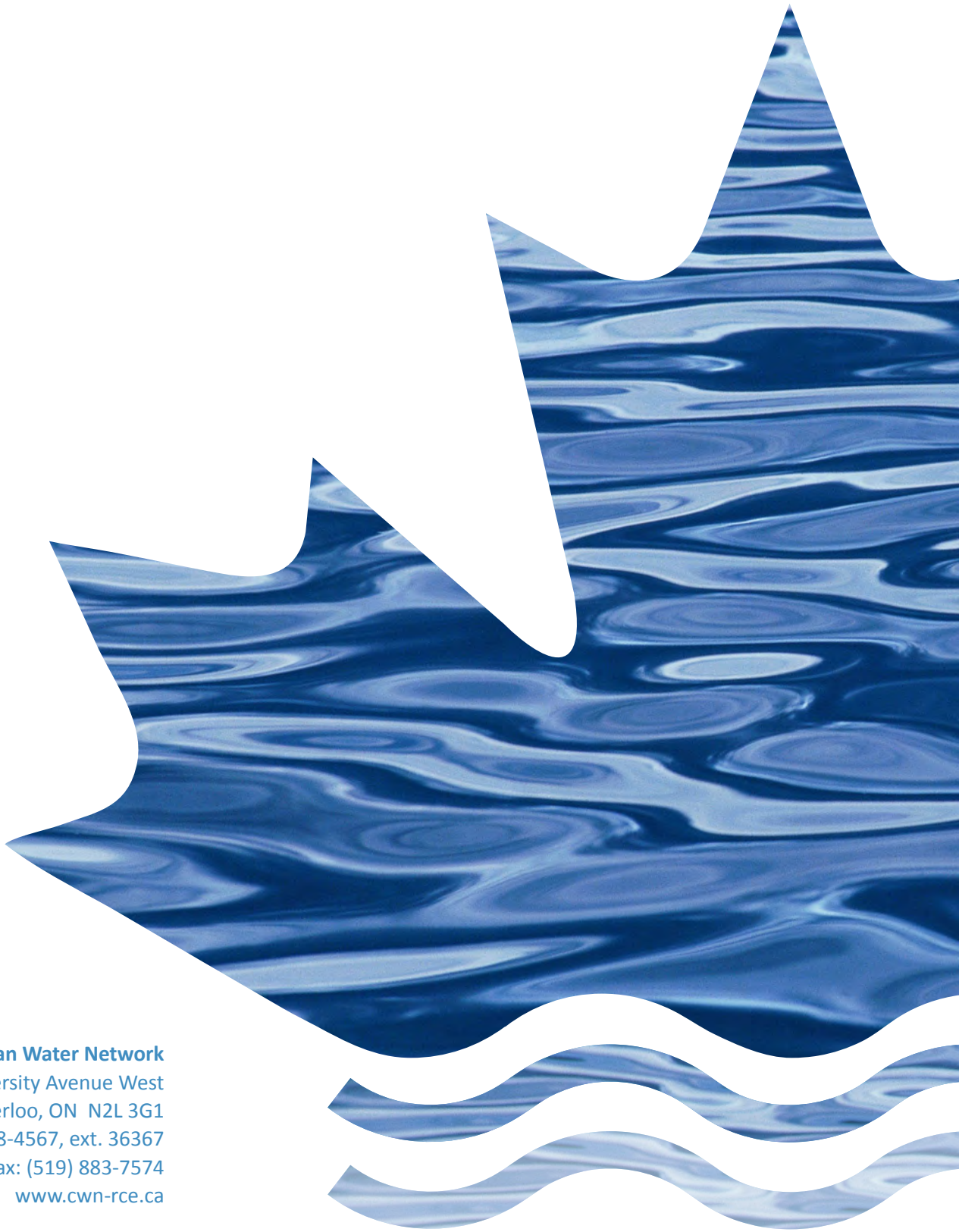

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