Future of Water Quantity Information in the Okanagan Basin

June 28, 2007

Final Workshop Summary

Prepared for

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Table of Contents

List of Tables

List of Figures

1. Background

The Future of Water Quantity Information in the Okanagan Basin workshop was held June 28, 2007 at UBC-Okanagan. The workshop was attended by participants who represented Okanagan Basin water supply stakeholders, including representatives from industry and science, non-governmental associations, and municipal, Provincial and Federal government. A complete list of participants is in Appendix A.

The workshop was initiated by Fern Schultz and Tony Cheong of the Science and Information Branch of Water Stewardship Division, BC Ministry of Environment (MoE) based on ideas proposed by Water Highway BC. It was facilitated by Clint Alexander of ESSA Technologies Ltd., with support from Kelly Robson (ESSA) who documented the proceedings.

Prior to the workshop, participants were provided with the discussion paper "Future of water quantity monitoring in the Okanagan Basin" (Sellars 2007, included in Appendix C) in order to enhance and inform their participation in the workshop. A workshop agenda was also circulated to participants prior to the workshop.

1.1 Workshop objectives

Prior to the workshop, the sponsors (MoE) and the facilitator identified three objectives:

1. understand the current state of water quantity monitoring in the Okanagan Basin, including its importance to various stakeholders;
2. identify what Okanagan stakeholders, data users and decision makers aspire to with the hydrometric program; and
3. explore ways to renew the hydrometric program in the Okanagan Basin (pilot project) and more broadly throughout the Province of BC.

1.2 Scope and scale of this initiative

The workshop is part of an ongoing initiative to renew cooperative frameworks in British Columbia for water quantity monitoring. In the case of the Okanagan Basin, this issue is of critical short and long-term importance:

> It is generally recognized that the Okanagan Basin is experiencing an increased stress on water resources. Development in the basin is imposing more demands on water resources while at the same time, the awareness of potential changes in climate have highlighted the need to plan for drought conditions. In addition, the impacts of water usage on the basin ecosystems must be addressed. …Hydrometric data have a wide range of applications and support a number of activities… Since monitoring began in the Okanagan Basin around 1915, a total of 178 hydrometric stations have been installed under the Water Survey of Canada (WSC) Program. This sounds impressive except that 156 have been discontinued. Of the 22 that are left, 13 are on regulated streams which means they are of limited use for determining natural runoff and one just records lake level. **That leaves a grand total of 8 gauges on unregulated streams that can be directly used for analyzing natural runoff in the Okanagan Basin**… Developing an

> understanding of the hydrology of the Okanagan Basin with the current network is rather like trying to solve a 1,000 piece jigsaw puzzle with only 8 pieces. Different orientations of each piece are tried until a picture emerges. But is it the right picture? You might find one more piece that may confirm the initial picture or it might require the pieces to be reoriented to make a different representation. Each additional piece of information is invaluable in understanding the hydrologic complexity of the region.
>
> (Sellars 2007, available in Appendix C of this document)

A basin-centered test case

Workshop discussions surrounding improved cooperation on needs were centered specifically on the Okanagan Basin—the group did not attempt to develop a Province-wide model. Two factors prevent generic definition of a "template" approach: (i) the majority of BC watersheds have their own unique mix of hydrology and stakeholders, and (ii) the Okanagan Basin Water Board (OBWB) is the only "Water Board" of its kind in BC.

It is hoped that if the Okanagan Basin cooperative approach is successful, it can help guide future basin-centered water quantity monitoring initiatives across the Province. Hence, this effort is not about creating a "template" but rather a test case that will hopefully provide a positive example that inspires improved cooperation in other basin-focussed initiatives. As one participant noted: "If it's a good model that can show success, people will copy and adapt it."

Hydrologic scope may broaden

The cooperative framework on water *quantity* monitoring is one of a number of cooperative approaches to water issues underway in the Okanagan Basin. The cooperative framework participants are working on for water quantity monitoring will stay fairly narrow on this topic to give participants and stakeholders a better understanding of this complex issue. It is possible that once the working relationships are in place and well defined the scope may merge with other initiatives to include additional water issues such as water quality, water demand, ecosystem function, climate change, etc.

2. Workshop Deliberations

The workshop agenda (Appendix B) was generally agreed to by the participants at the start of the day. However, it became clear as the workshop progressed that the group was prepared to move faster, go further and skip parts of the agenda. The facilitator adjusted to this change and the majority of the day was spent on the last part of the agenda (defining the groups involved in pulling together a new cooperative arrangement for water quantity monitoring in the Okanagan).

Fern Schultz stated that one of the reasons for the workshop is to provide a forum to discuss and explore a range of ideas—this workshop is the first step in a series of steps. Fern mentioned that historically there has been a limited attention span of decision makers brought to water quantity monitoring due to the complexity of the issue and the often narrowly conceived and poorly communicated uses and benefits of the information. Improving awareness, communication and understanding of stakeholder needs and data benefits will help generate a collective interest.

2.1 Success criteria

In order to "take the temperature" of the workshop participants, the facilitator invited them to share their personal criteria for workshop success. This provided the participants with a 'real-time' method to measure the success of the workshop at the end of the day. The participants were asked what they would like to see happen at the workshop in order to end the day knowing it had been a worthwhile effort. The following list gives the participant responses (paraphrased in some cases), grouped into four categories: 1) concrete action; 2) enhanced understanding of needs; 3) importance of long-term monitoring; and 4) a basin-centered approach. Within categories statements ranged from being highly measurable, to others that were more qualitative.

1. Concrete action

- "We have an idea of what the problem is but we don't have a path for moving forward. There is tension between the Province's interests and local interests, so I want a path (agreements, arrangements, committees) for moving forward, not dig deeper into the details of the problem."
- "I don't want to redefine the problem over and over again, prefer on the ground, real world action. However, it comes down to money and perhaps people need to move to more of an entrepreneurial approach. I would like to see an action plan with teeth in it. Specific deliverables on specific dates."
- "I am looking for a strategic planning framework to move this forward on a Provincial basis."
- "I'm here to listen and learn. There are a number of these meetings going on across the country. I'd like to see concrete action plan at the end of the day, with clear deliverables, clear timelines."
- "Concrete action, plan to move forward. Also, I would consider the meeting a success if in this workshop everyone feels comfortable to have an open and frank conversation, no hidden agendas."
- "I support the three workshop objectives. However, we should not point to solutions that are outside of the room. New models, new government structures should move forward by optimizing our strengths. I would like everyone to agree to cooperate."

2. Enhance understanding of needs

- "It's important to have a greater appreciation for the Okanagan context and Okanagan needs because it is a unique situation."
- "We have to understand what the needs are in the basin from all perspectives. There are many needs in this room, but doubtful that anyone understands wholly what each other's needs are."
- "There is success if everyone comes out with a clear understanding of what the issues are and how they're framed. The most important thing is a clear understanding of what needs to be done and how to move forward."
- "I want an increased awareness of the hydrometric program. Also want to see if a basin-level approach is workable."

3. Importance of long-term monitoring

- "I'd like to see a guarantee for continuity in hydrological data."
- "Getting good data is of ultimate importance."
- "We need to find a way to develop reliable short and long term water supply information. It's critical from a water utility perspective, important for long term growth. A lot of us are using information that's 30 years old. It's long overdue to update."
- "Water management is critical, and without reliable data it's very difficult."

4. Basin-centered approach

- "The management of the water quantity system in this watershed should directly involve people in this watershed. We need detailed data, and need a locally grown administrative unit to take realistic ownership of the issue and solutions."
- "Focus first on the Okanagan (and other basins), not the Province as a whole. I'd like to see the beginning of a workable option."

2.2 Current status of the water quantity monitoring network in the Okanagan Basin

Overview by Fern Schultz (Science and Information Branch, Water Stewardship Division, BC Environment)

Fern Schultz gave an introduction to the current status of the water quantity monitoring network and an overview of the current management framework. She emphasized that though the working relationship between Provincial and Federal organizations is over 30 years old, it's an important working relationship that overall has been successful.

Fern Schultz stated that funding instability is one of the greatest challenges the Provincial water quantity monitoring network has faced in recent years. Due to the long-term nature of data collection needs, commitments of 5, 10 and even 20 years are required. Also, the current structure does not always allow local user need to be brought in effectively and consistently.

The discussion on opportunities in the Okanagan should bring a more integrated view of how water quantity monitoring integrates with other water issues. It is critical to work together to create a greater awareness of water quantity issues and how it is influenced by climate change, especially in the Okanagan.

The Provincial bureaucracy itself can only go so far in raising awareness of the importance of this issue and value of the program. What is needed now is a broader awareness within watersheds. One of the aims is to have a collective interest in the issues which should ultimately enhance the Provincial and Federal government awareness and lead to creative ways of renewing water quantity monitoring.

Overview by Al Wallace (Environment Canada)

Al Wallace gave an overview of Federal and Federal/Provincial hydrometric stations in the basin. Environment Canada is responsible for data standards and delivery of the data, but not for resolving the needs of data users. We first need to understand these needs, and then we figure out how to get it and how it will be financed.

Al Wallace stated that the department is under financial pressure, and a lot of the programs are labour intensive. Water is a growing Federal priority but the government has not defined how it fits into all relevant Federal programs.

He also stated that it is very unlikely there will be an increase in Federal funding for water quantity monitoring. The current funding for water quantity monitoring in British Columbia is $5 million annually (440 stations). Approximately 33–40% of this amount is provided Federally and 60% Provincially (including partners). The Provincial portion includes contributions by industry (such as BC Hydro, Alcan).

A participant noted that BC Hydro alone returns roughly $800 million to the Province annually in monies directly tied to water resources.

Presentation by John Azar (Water Highway BC)

John Azar provided a short overview presentation on Water Highway BC (WHBC) and the benefit/cost attributes of water quantity monitoring data. WHBC was formed in response to the possibility of halving the funding to the water quantity network in BC. In his presentation, he emphasized that $5 million is a very small annual budget relative to the large economic benefits returned (and see Azar et al. 2003). From Water Highway BC's perspective, the emphasis should be on re-capture and re-direction of tax dollars, not opening up new conduits for user pay. A fundamental premise held by WHBC members is that executive level awareness is lacking. Despite the many demands and competing priorities placed on government, the monies that are coming from industry and other economic pathways tied to water resources are not coming back in nearly sufficient proportion to support and enhance the water monitoring network.

However, the first step is increasing awareness of the value of this data source, improving cooperation, and more concretely defining the range of data needs. From here, it should then be more tractable to come to some understanding of what type of water monitoring network is required, and what the annual budget would be to support this network.

Presentation by Tony Cheong (Science and Information Branch, BC Environment)

Tony Cheong gave a presentation on non-integrated data, which refers to water quantity information collected outside of the Federal-Provincial network (Appendix D).

Tony Cheong pointed out that there is a lot of data out there, and most of it is for a specific purpose, collected by consultants, industry and NGOs. This data can be important to meeting data needs, fill in gaps, but the data is hard to obtain and is collected according to different, sometimes unknown quality standards. Further, there is no method for centralizing access to this information. The BC Ministry of Environment has some tools to help track and centralize access to this data, and it would be helpful to more thoroughly implement the use of these tools (e.g., WIDM - Water Information Data Management system). Table 1 lists key sources of non-integrated water quantity data identified during the June 28th workshop.

Table 1. Potential sources of non-integrated data in the Okanagan Basin. Note: contact information for most individuals mentioned in this table is available in Appendix A.

Contact	Details
Don Dobson	25 stations in the Okanagan Basin, and Greater Vernon Services has a few stations. This data is gathered for clients, and data may be shared if the clients agree.
Rick Simpson	The Ocealo Fish and Game Club has data loggers taking temperature and water level readings of upper and middle Vernon Creek and at Ellison Lake. They have shared that info with the District of Lake Country.
Carla Davis	The Okanagan Nation Alliance has 5 temperature and water level gauges.
Water Stewardship Division	BC water licensing database.
Water Stewardship Division / Brian Guy	Data being collected within the Okanagan Water Supply/Demand study. (Once complete, this promises to be the most comprehensive single source of water supply *and* demand data for the Okanagan Basin as a whole since the 1974 study).
Stephen Boulton	spOke (not a data source per se but a web-based access point).
COBTWG, Kim Hyatt, Margot Stockwell	Okanagan Fish/Water Management tools database. (Capable of generating lake elevation and Okanagan River flow trajectories under different net inflow conditions – not a 'new' source of raw data, rather, a proven integrative framework for retrospective and prospective modelling).

Due to variable quality assurance, Al Pietroniro (Environment Canada) noted that there are Federal liability concerns regarding supporting the use of this type of data. Table 2 summarizes key points emerging from this discussion.

Table 2. Non-integrated data—points of general agreement and recommendations, and points of departure or issues requiring further discussion.

Points of general agreement & recommendations	Points of departure or issues requiring further discussion
This data is valuable, and needs to be catalogued and tracked to understand how it can assist in filling gaps to help "complete the puzzle". The capture or data submission process for this data needs a champion, and members of the water management community need to be made more widely aware of how to contribute to and access this data (e.g., WIDM, spOke).	The significance of the legal liability issues relative to data scarcity and greater needs – is it fair to insist on high calibre data standards whilst not assisting fully in funding the realization of this quality level? Is it not more prudent to pursue different quality assurance levels (e.g., grade A, B, C, D) and tag them with an associated risk statement (that is immune to "ambulance chasers")?

2.3 Funding

There was considerable discussion of funding stemming from John Azar's presentation. Table 3 summarizes this discussion.

Table 3. Funding—points of general agreement and recommendations, and points of departure or issues requiring further discussion.

Points of general agreement & recommendations	Points of departure or issues requiring further discussion
We should not focus discussion on funding at this meeting. Offloading of government responsibilities is a widely held concern of local governments and those closely involved with delivering water monitoring programs. We need to be planning with a long-term view: 15-20 year time frames at least, certainly not 5 or fewer years that are common due to electoral cycles. Water *quantity* is only one part of an effective water monitoring system. The water quantity monitoring needs, gaps and priorities for the Okanagan Basin must be clearly defined and then, in consultation with the Province and Environment Canada, determine which of those needs can be met. Where gaps persist, work cooperatively to determine the next steps aimed at filling those gaps.	The amount of funding that ought to be supplied by the Provincial and Federal governments vs. local (municipal) and industrial sources.[δ]

[δ] This issue is thoroughly and compellingly addressed in Azar et al. (2003).

Tom Siddon reminded participants of the warning offered in David Sellar's backgrounder (Appendix C)—that past efforts to move advocacy and cooperation forward have faltered due to the conflation of management structure with funding.

Participants subsequently agreed to "park" the funding issue for purposes of the workshop. All were comfortable with a direction that recognized the basis for progress was better cooperation and advocacy. This renewed cooperation is believed to *enable* new opportunities for government funding as well as open up the prospect for partnership funding once working relationships and sustained good will are demonstrated.

2.4 Improving cooperation

The strongest message that crystallized at the workshop was that more cooperation and better communication was required between governments, stakeholders and data users, and that in practice, the most sensible scale for this communication is at the basin-level. Because of the variation in needs associated with water data, it is a mistake to assume that any one entity will alone have the requisite understanding necessary to plan a balanced water monitoring system. A second point of agreement was that many executive level officials do not understand the need for and value of water quantity monitoring. A key reason for this is that there is a tendency for technical people to be involved with explaining the rationale for this type of monitoring, but these people often lack the skills to boil down needs and arguments in concise, powerful, points of advocacy that executive level officials can readily grasp[1].

Participants further agreed that the starting point for improving cooperation and working relations was to dispassionately review water quantity monitoring needs across levels of government and classes of stakeholders (starting at the basin scale in the Okanagan). Table 4 provides a preliminary summary of the types of needs mentioned during the workshop, at varying scales or levels of management. Once this type of assessment is in hand, gaps could then be explicitly identified and jointly evaluated for implications. This needs and gaps analysis is critical because the context for water monitoring (in the Okanagan and elsewhere) has dramatically changed with population growth and climate change. By taking an integrated view, different levels of government and stakeholders can develop a shared understanding about what is important and hopefully more effectively influence executive leaders, businesses and communities to take a more active interest.

[1] This is one of the reasons why a concerted effort is made in this document to replace the technical word "hydrometric" with water quantity monitoring.

Table 4. Preliminary listing of major water monitoring needs by type of entity.

Organization / Entity	Focal needs
Environment Canada	• Trans-boundary water operations • Ensuring data standards
BC Province	• Flood forecasting • Low flow forecasting • Infrastructure planning (dams, bridges, flood channels, culverts) • Water licensing and allocation
Regional data users (e.g., Regional Districts, Municipal governments, Improvement Districts, Okanagan Basin Water Board)	• Water supply and demand (surplus water availability for development, agriculture) • Water quality • Climate change adaptation • Performance of demand management options • Understanding groundwater limits and how best to promote sensible groundwater licensing • Ecological flow/lake level requirements • Aesthetic flow/lake level requirements
Specialized research teams (e.g., UBC-Okanagan, Ministry of Agriculture, Canada Okanagan Basin Technical Working Group, etc.)	• Hydrologic and water balance model calibration • Prospective climate change studies • Private sector client needs (e.g., forestry & mining sector)

Table 5 summarizes other components of the discussion about renewing cooperation and sharing responsibility for advocacy.

Table 5. Creating a new cooperative framework—points of general agreement and recommendations, and points of departure or issues requiring further discussion.

Points of general agreement & recommendations	Points of departure or issues requiring further discussion
We need more than just technical people working on water quantity issues.	No significant points of departure
Water is fundamental to the growth of BC's economy, and we have to be far more effective in getting this message out. The responsibility for advocacy in this regard, must be shared, particularly at more sr. levels.	
Need a regional, Okanagan advocacy group to address these issues and develop improved working relations with the Province. Essential to keep the lead for water quantity framework within the Okanagan Basin. The Okanagan Basin Water Board will take on this leadership role.	
Do not worry about the details of management structure right now, just keep it simple and start to lead.	
Hydrometric information shouldn't be viewed in isolation from water quality, evaporation, groundwater, recreational use, etc. especially when communicating with the public.	
We want to increase public awareness of water quantity issues in order to create a sense of political necessity.	

2.5 A new cooperative framework to address water quantity monitoring needs in the Okanagan

After addressing the current management framework and state of funding, the facilitator then challenged the participants to characterize how this workshop will be different from the meetings that have taken place on this topic before. Anna Sears of the Okanagan Basin Water Board noted that this meeting is different because it is taking a basin-centered view of the issues. Fern Schultz pointed out that the meeting is different because for the first time there is an atmosphere of cooperation and an appetite to explore a new working relationship between a regional entity (the Okanagan Basin Water Board) representing the full suite of stakeholders, and the Provincial and Federal governments.

Table 6 identifies the entities comprising the new cooperative framework discussed at the June 28 2007 workshop, along with suggested responsibilities and success factors. Figure 1 shows a preliminary organization chart based on Table 6. **It is emphasized that this is a first attempt at defining the new cooperative framework, and the concepts noted here will continue to evolve and change as details are worked through by the OBWB and the Province, and other partners, including Environment Canada.**

Table 6. **DRAFT** entities comprising the new cooperative framework in the Okanagan, along with their suggested responsibilities and success factors. As of the date of this report, details of group responsibilities remain an open and active subject.

Entity	Responsibilities	Success Factors
Principals & Partners (Federal and Provincial governments, BC Hydro & misc. partners)	Authorize 'current' fiscal year $ for WSC operated network. Standards. Service level delivery.	Willing to provide leadership and assist in integrating and meeting the different needs
Okanagan Basin Water Board (OBWB)	**Strategic direction and central coordination with Principals and Partners, other advocates such as Water Highways BC** (scope: Okanagan Basin). **Advocacy & leadership at the regional scale**, clearly communicating key Okanagan needs to government and the public, as well as the local benefits of water monitoring. Develops communications strategy for items above. Appoints members to **Technical Water Monitoring Working Group** (TWMG). Handle issues of qualifications, matching need to right expertise, appointment durations, managing for conflict of interest, removal of TWMG members. Considers (but is not bound to) Okanagan Water Stewardship Council (OkWSC) advice on TWMG membership. Receive and translate advice from TWMG and OkWSC through to Principals and Partners, executive level leaders, as well as other regional research groups, entities. Serve as the hub / nexus for water (quantity monitoring) related information (e.g., add elements on OBWB web site). Decide how the TWMG will address issues related to funding.	Do not rely on the TWMG to craft 'executive summary' level recommendations. Define a smaller executive to drive out clear messages to executive level government leaders and the public. Anna Sears noted that how much the OBWB is able to do will depend on the commitment of Environment Canada (Al Wallace, Al Pietroniro), and the Ministry of Environment (Fern Schultz and Tony Cheong), as well as the progress achieved by the Technical Water Monitoring Working Group.
Water Stewardship Council forestry, mining? <not represented, 'in loop'>	Stakeholder body. Suggests members for TWMG (but no authority to appoint). Also provides a broad technical advisory arm to OBWB. Use to test recommendations made by TWMG with stakeholders before they are taken to the OBWB.	Trust, members able to speak freely and frankly. Representativeness.

Entity	Responsibilities	Success Factors
Technical Water Monitoring Working Group (TWMG) *Phase 1:* interim working group, with initial focus water quantity. Would "sunset" on a defined timeline. Later, all other types of data, such as lake evaporation, groundwater, etc. would be brought within the group's purview. Future phases may take a role in overseeing the management of the water supply/demand database. E.g., administrate ongoing water supply/demand updates.	**A new, regional, technical group of appointed members, potentially including members from OkWSC. Members should also include one representative from the Water Survey of Canada and one from the BC Province** (Water Stewardship or Science and Information). **Responsible for clarifying sufficient water (quantity) monitoring needs, gaps & priorities in the Okanagan Basin.** (Intentionally focuses on working out gaps and priorities and does not become conflated in addressing funding issues). Makes recommendations on options for how best to bring in non-integrated information, including addressing 'necessary' data standards. Identifies how to optimize use of existing information; clarify the role of models; clearly define limitations of old data and modelling. Coordinate links *at the technical level* with Feds/Province. Makes recommendations to OBWB. E.g., provides short, punchy "technical speaking points". May first pilot test these recommendations with the Okanagan Water Stewardship Council.	**Has to be small (≤ 8 members).** **Quickly develops a clear workplan, focused mandate, with clear deliverables and timelines.** **Possesses the "right" balance of expertise, and maintains high technical integrity unfettered by conflicts of interest.** **Integrates with Water Supply/Demand study, without diverting resources.**

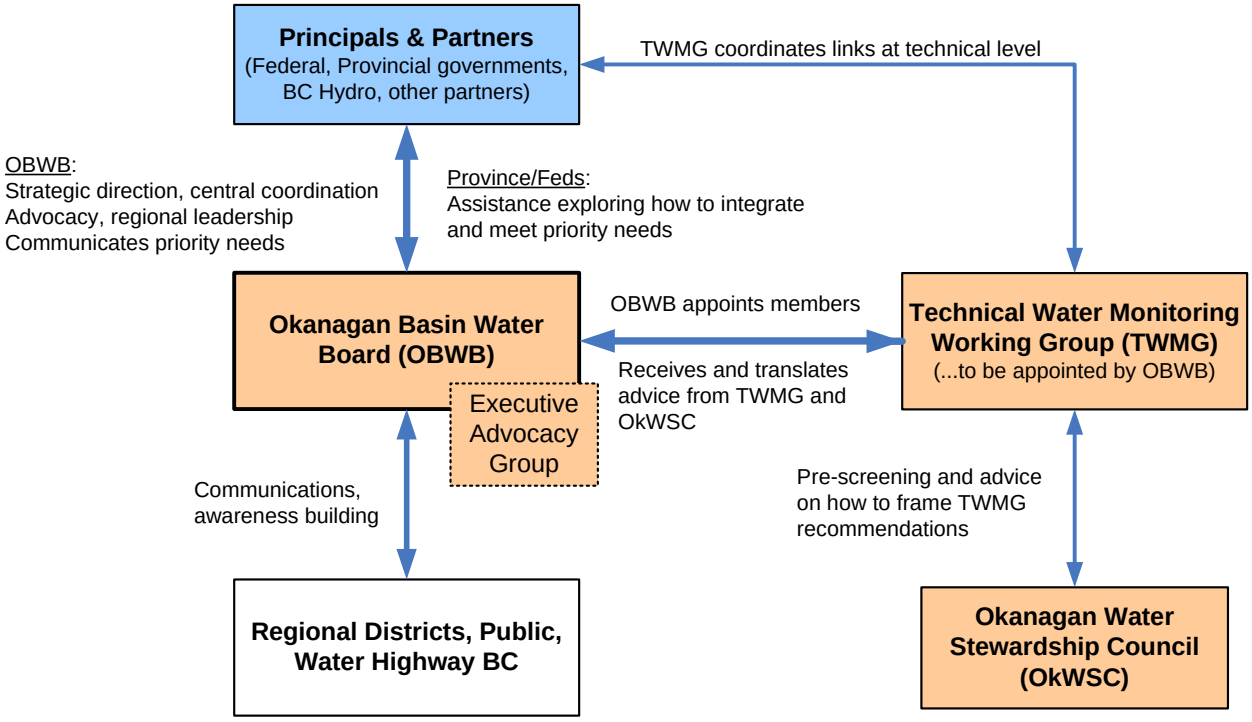

Figure 1. Preliminary organization chart of the new cooperative framework.

Formation of Technical Water Monitoring Working Group (TWMG)

The workshop participants proposed forming a Technical Water Monitoring Working Group, parented by the Okanagan Basin Water Board to clarify what sufficient water (quantity) monitoring needs, gaps and priorities are in the Okanagan Basin (Table 6). This group would work cooperatively with both the OBWB and technical staff from the Federal and Provincial government. Table 7 summarizes some other points discussed.

Table 7. Technical Water Monitoring Working Group—points of general agreement and recommendations, and points of departure or issues requiring further discussion.

Points of general agreement & recommendations	Issues requiring further discussion
Need for an executive level advocacy group to deliver the message to sr. government officials.	Who do we need to talk to, who are the major stakeholders being engaged?
Need to keep the Technical Monitoring Working Group small and manageable.	The Technical Water Monitoring Working Group: does it have a specific time frame and then dissolves, or does it live on, evolve?
Data gaps need to be addressed, but it's also important to make sure we are effectively using the data we have.	
When the OBWB appoints members to the Technical Water Monitoring Working Group, they must make sure the right people are selected who do not represent narrow interests (will think representatively).	
The Technical Water Monitoring Working Group should have clearly defined objectives, deliverables, and a clear timeline.	

The following people were suggested as potential members in the interim Technical Water Monitoring Working Group

- Tony Cheong, MOE;
- Don Dobson, consultant;
- Brian Guy, Project Manager of the OK water supply and demand study;
- Stu Mould, semi-retired engineering consultant;
- Phil Epps, MOE Water Stewardship Division;
- ONA, Howie Wright to be approached to identify representative; and
- Bruno Tassone, Water Survey of Canada, Environment Canada.

Don Dobson stated that he would be willing to Chair the Technical Water Monitoring Working Group as long as there were clearly defined objectives, clear deliverables, and a clear timeline.

3. Next Steps

Concrete and specific next steps were a major criteria for success laid out at the beginning of the meeting. Table 8 lists the next steps agreed to by the workshop participants.

Table 8. Next steps.

	Next steps	Point of Contact	When
1.	Strike an 'interim' Technical Water Monitoring Working Group (TWMG), assign a Chairperson. Chairperson, working with all members of TWMG, develops a proposal for approval on the specific mandate, deliverables and timeline of the TWMG. Presents to OBWB, revises as necessary.	Anna Sears of the Okanagan Basin Water Board Don Dobson?	August 2007 September 2007
2	Workshop Summary Document (DRAFT) to Fern / Tony	ESSA	July 10 2007 <complete>
3	Participant review of Workshop Summary Document	Workshop participants	July 17 - 20 2007 <complete>
4.	Final Summary Document (consolidating participant comments)	ESSA	July 30 2007* <complete>
5.	Further independent development of responsibilities and mandates in Table 6. Meeting between Province, OBWB and OkWSC to 'validate' the scope of the cooperative framework, and its success criteria. Parties agree to final mandate and direction for the 'interim' Technical Water Monitoring Working Group Additional action steps to follow from this meeting.	Fern, Tony, Okanagan Basin Water Board and Okanagan Water Stewardship Council	September/October 2007 <specific date to be determined>
6.	TWMG drives out its pre-defined deliverables, culminating in a report.	Don Dobson, under supervision of OBWB	January 2008
7.	TWMG reports back to OBWB as well as this group (Appendix A), on needs, gaps, priorities and recommendations. Reconvene this workshop group and go over the Technical Water Monitoring Working Group report and take pulse of best direction for Step 8. Workshop participants comment, provide	Workshop participants (Appendix A), +/- few new individuals	January / February 2008

	Next steps	Point of Contact	When
	input that will be taken into account by OBWB leading into step 8.		
8.	Improved advocacy and awareness raising. Effective communication of priority needs identified by OBWB following consultation with WSC and MoE. May culminate in written proposals to the Province, which would be needed no later than Jan/Feb 2008 to influence 2008/2009 funding decisions.	OBWB	Ongoing Early 2008 given that current 'augmentation' to Provincial funding for the hydrometric program expires March 2009. Other awareness raising opportunities: - September water science forum, Osoyoos. - CWRA/OBWB conference planned for Feb 2008. - June 2009, water supply and demand completion.

* If the participant review process is deemed complete by July 20th 2007.

3.1 Success factors and risks

As a preliminary workshop to explore alternative cooperative arrangements, there are a variety of assumptions inherent in the recommendations and next steps in this summary document. Completing steps 1–8 above will require perseverance—commitment of time and energy from the various people involved. Progress will not "come for free" or happen without some effort. The various entities involved are encouraged to reflect on this, and ensure they are able to see this initiative through to completion in January/February 2008.

Comments on success factors and risks are particularly welcomed during review of this summary document.

4. References and Additional Resources

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Okanagan Basin Water Board website: www.obwb.ca

Okanagan Basin Water Supply and Demand Study: www.obwb.ca/water_supply_demand/

Appendix A: List of Participants

Name	Organization	Phone	email
Clint Alexander	ESSA Technologies (Facilitator)	(250) 860-3824	calexander@essa.com
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Tony Cheong	BC Ministry of Environment	(250) 387-9585	Tony.Cheong@gov.bc.ca
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Toby Pike	Water Supply Association of BC	(250) 861-4200	pike@sekid.ca
Kelly Robson	ESSA Technologies (Workshop recorder)	(604) 733-2996	krobson@essa.com
Kerry Rouck	Council of Forest Industries	(250) 768-6220	krouck@gormanbros.com
Anna Warwick Sears	Okanagan Basin Water Board	(250) 550-3779	anna.warwick.sears@nord.ca
Fern Schultz	BC Ministry of Environment	(250) 387-6722	Fern.Schultz@gov.bc.ca
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John Slater	Okanagan Basin Water Board and Town of Osoyoos	(250) 495-6515	jslater@osoyoos.ca
Doug Smith	BC Hydro	(604) 528-2042	Doug.Smith@bchydro.com
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Al Wallace	Environment Canada	(604) 664-9090	al.wallace@ec.gc.ca
Bruce Wilson	Chair, Water Supply Association of BC	(250) 765-5218	bruce@rutlandwaterworks.com

Invited, but did not attend

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Appendix B: Workshop Agenda

Future of Water Quantity Information in the Okanagan Basin

June 28, 2007
8:30 am - 4:00 pm
UBC OKANAGAN, KELOWNA CAMPUS
3333 UNIVERSITY WAY (NEAR THE AIRPORT)
ARTS BUILDING, ROOM 102

This one-day session is being hosted by the Water Stewardship Division of the British Columbia Ministry of Environment, in collaboration with the Okanagan Basin Water Board. At this workshop, we will be seeking your input as a current or future stakeholder in water interests in the Okanagan Basin. The session will be facilitated by Clint Alexander of ESSA Technologies, Kelowna.

Your ability to engage will be well enhanced by reading the workshop discussion paper (prepared by David Sellars) that was distributed with this agenda.

Workshop Objectives:

1. **Understand the current state of water quantity monitoring in the Okanagan Basin, including its importance to various stakeholders;**
2. **Identify what Okanagan stakeholders, data users and decision makers aspire to with the water quantity monitoring program; and**
3. **Explore ways to renew the water quantity monitoring program in the Okanagan Basin (pilot project) and more broadly throughout the Province of BC.**

~ AGENDA ~

8:30 am	**Coffee, tea, muffins (provided)**	
9:00 to 9:40	Welcome, Introductions	Fern Schultz
	Workshop format, collection of workshop success criteria from participants • *Go around room…*	Clint Alexander
9:40 to 10:30	Outline of current management framework and previously identified issues • Explicit identification of the main problem(s) we are trying to overcome	Fern Schultz Al Wallace

	• *Participants provide feedback on these problems, add others, brainstorm potential solutions*	Clint Alexander
10:30 to 11:15	What type of participation & functions (e.g., strategic direction, operation and delivery, priority setting, etc...) do Okanagan stakeholders, data users and decision makers aspire to? • *Silent generation, grouping then discussion*	Clint Alexander
11:15 to 12:00	What decision making responsibilities (e.g., advisory vs. decision making authority) enable the identified groups to be effective? • *Silent generation, grouping then discussion*	Clint Alexander
12:00 to 12:45	**Lunch (provided) & networking**	
12:45-1:15	What are some success factors for increasing the chances of successful decision making or choosing the preferred arrangement amongst groups? e.g., "representativeness", "highly transparent", "easy to implement", "technically competent", "budget feasibility", etc. • *Silent generation, grouping then discussion*	Clint Alexander
1:15 to 2:00	Non-integrated Information and the Hydrometric Program: Challenges and Solutions • *Ask people to provide feedback on these challenges & solutions and brainstorm*	Tony Cheong Clint Alexander
2:00 to 2:15	**Break**	
2:15 to 3:30	**Pull it together…** Group exercise to take lists of potential membership, functions, decision making levels and criteria and diagram out candidate arrangements for how groups in the Okanagan wish to be integrated. • *Split into 3 groups, take lists from previous steps, integrate into alternate models*	Clint Alexander
3:30 to 4:00	Summary of key issues and next steps for moving forward, persons responsible	Clint Alexander
4:00	**ADJOURN**	

Task / Process:

- The workshop will utilize a fast moving, interactive plenary format consisting of facilitated discussions around key 'topics' & 'questions'. Dialogue will be free flowing, open to the floor, respecting the agenda and the facilitator's right to govern time.

- The meeting facilitators will document workshop discussions, including keeping a pulse on levels of agreement and disagreement.
- Participants will be engaged in one or more individual or group exercises.
- The facilitator may from time to time intervene when issues bog down group discussions. These issues will be "Parked", and returned to later if there is time (see **Error! Reference source not found.**).
- Silence means agreement.

Ground-Rules:

- **Hard on the problem, easy on the people.**
- Keep the discussion at a high strategic level related to improving governance and management. Do not want to delve too deep on tactical details.
- This group involves people of varying experience levels, and some people will want to move faster than others. Everyone should be sensitive to this, manage their expectations accordingly.
- Distinguish ideas that fall at the regional (Okanagan basin) vs. Provincial scale. Participants are asked to focus first on the regional scale, and where possible consider how flexibly these ideas 'scale up'.
- Don't expect that the group will solve everything in one day!

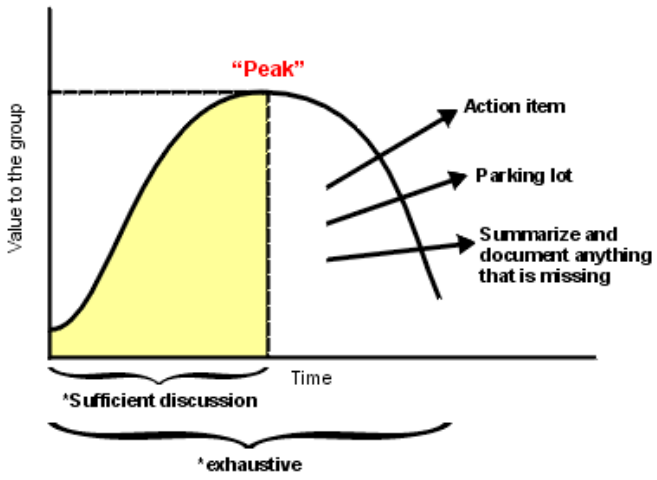


Figure 1. In a workshop or meeting, the value of a given line of discussion to the group "peaks" after which it becomes exhaustive and less helpful. Aim for *sufficient* discussion rather than exhaustive.

Appendix C: Workshop Backgrounder

FUTURE OF WATER QUANTITY MONITORING IN THE OKANAGAN BASIN

DISCUSSION PAPER

Prepared by C. David Sellars, PEng

Water Management Consultants

The June 28, 2007 workshop on water quantity monitoring in the Okanagan Basin represents an opportunity for the users of water quantity data to influence the future direction of monitoring in the Okanagan and more broadly throughout the Province of British Columbia. This discussion paper outlines the need for water quantity data, describes the status of monitoring in the Okanagan Basin and explores a range of options for future management of the water quantity monitoring program. The paper concludes by presenting a set of objectives for the workshop as a series of questions that could be addressed by participants.

Why do we need water quantity monitoring?

It is generally recognized that the Okanagan Basin is experiencing an increased stress on water resources. Development in the basin is imposing more demands on water resources while at the same time, the awareness of potential changes in climate have highlighted the need to plan for drought conditions. In addition, the impacts of water usage on the basin ecosystems must be addressed. To manage water resources in the basin effectively we need to understand a number of key hydrologic issues:

- **Spatial distribution of natural runoff**, particularly the change in runoff with elevation and changes within the basin from north to south.

- **The time variability of natural runoff**. How does runoff vary seasonally, monthly, weekly and by year? Do we have sufficient information to predict the probability of occurrence of a drought similar to the three consecutive years of drought from 1929 to 1932? The annual flow in the Okanagan River at Penticton over the three years was only 16% of the long term mean recorded from 1922 to 2005.

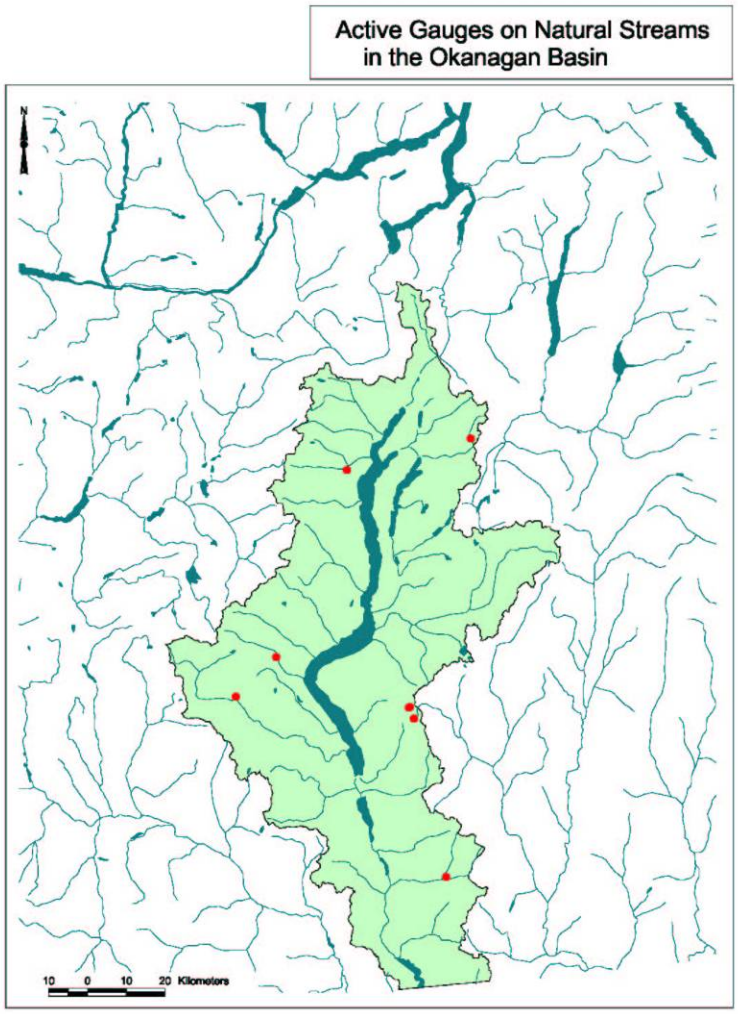
- **Shifts in the climate regime**. Does the recent change in climate in the Okanagan represent a long-term shift or does it reflect a climate oscillation over several decades. Annual Okanagan Lake inflows from all surface sources are projected to decline by up to 30% by the 2080s. (Cohen and Neale, 2006). The recorded three year drought from 1929 to 1932 represented an even more significant low flow condition.

Hydrometric data have a wide range of applications and support a number of activities including the following:

- Calibrating and verifying hydrologic models
- Regional flood and drought frequency analysis
- Reservoir operations planning and implementation
- Assessment of aquatic ecosystems
- Water licence management
- Climate change assessment
- Water supply planning

Status of monitoring in the Okanagan Basin

Since monitoring began in the Okanagan Basin around 1915, a total of 178 hydrometric stations have been installed under the Water Survey of Canada (WSC) Program. This sounds impressive except that 156 have been discontinued. Of the 22 that are left, 13 are on regulated watercourses which means they are of limited use for determining natural runoff and one just records lake level. That leaves a grand total of 8 gauges on unregulated streams that can be directly used for analyzing natural runoff in the Okanagan Basin; less than 5% of the stations that have been installed over the past 90 years. There are records available for 31 discontinued gauging stations on unregulated streams but they are of limited use if there has been a shift in the Okanagan climate with an associated change in the hydrologic regime.



In addition to the WSC network there are significant amounts of data collected by organizations that are not included in the WSC database. Integration of this informal network into the system is a challenge that has not yet been surmounted. Issues to be addressed include data reliability and quality control of the information.

Developing an understanding of the hydrology of the Okanagan Basin with the current network is rather like trying to solve a 1,000 piece jigsaw puzzle with only 8 pieces. Different orientations of each piece are tried until a picture emerges. But is it the right picture? You might find one more piece that may confirm the initial picture or it might require the pieces to be reoriented to make a different representation. Each additional piece of information is invaluable in understanding the hydrologic complexity of the region.

The presence of a long-term stream gauge within a watershed can make a significant difference to the accuracy and credibility of water management plans. The Trout Creek Water Use Plan for the District of Summerland (Sellars and Smith, 2005) was based on the natural stream flows recorded on Camp Creek, a tributary of Trout Creek. The 36 years of record on Camp Creek

were used to calibrate a hydrologic model of the Trout Creek watershed which was then extended to 67 years based on climate records. The model was used to simulate operation of the Trout Creek reservoir system which was the basis of the reservoir operation scenarios. For implementation of the Water Use Plan, the real time data from Camp Creek is being used as an index of watershed conditions to adjust the level of fish flow releases. Without the continuous long-term record from a natural stream in the Trout Creek watershed, the Water Use Plan would have been much less credible to the stakeholders and adoption of the plan might have been compromised. Most watersheds in the Okanagan Basin are not so well-endowed as Trout Creek.

Why we need a climate change in network management

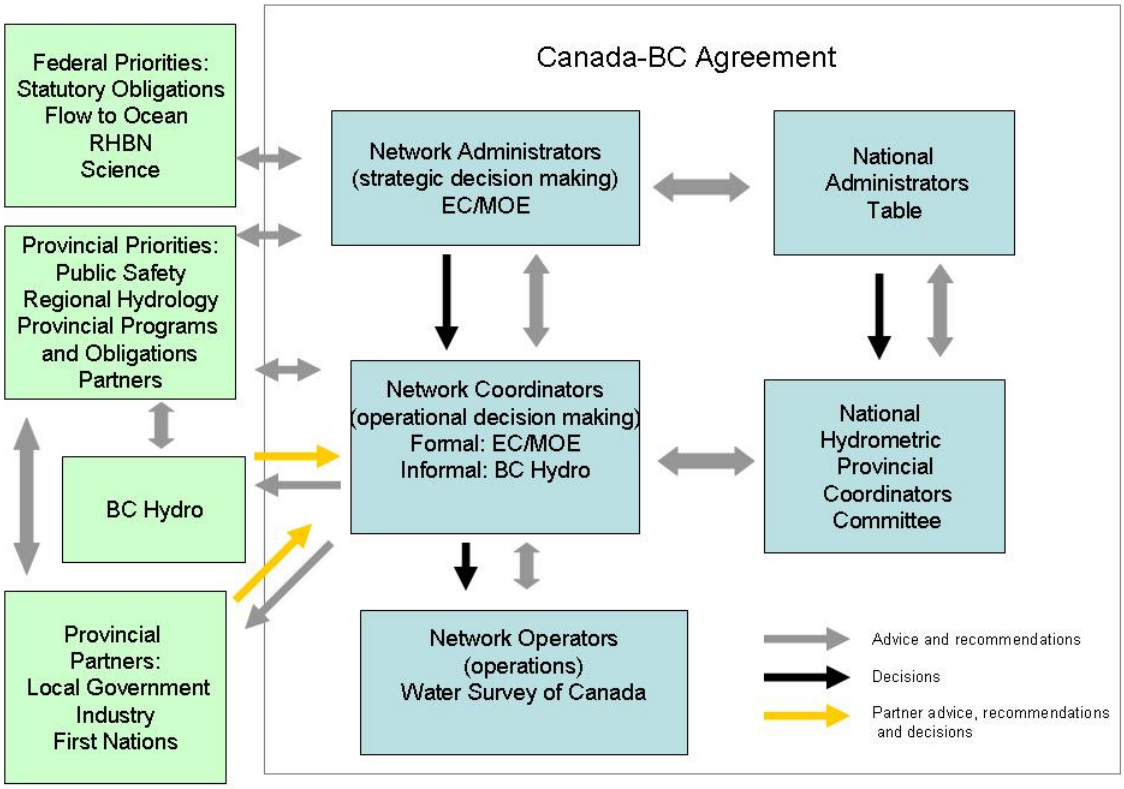
Management of the hydrometric network in Canada has been entrusted to the Federal and Provincial Governments. There is a cost-sharing agreement between the two levels of governments regarding network management and operations. The Water Survey of Canada (WSC) operates the network and disseminates the data under the Canada-BC Agreement.

There has been a tendency in the past for governments to view the network primarily as an adjunct to their internal programs and needs; secondarily as a service to the data users. This “closed shop” has led to a number of outcomes including:

- Downsizing of the network in response to budget shortfalls with limited user consultation.
- Lack of consultation with other data users on network management issues.
- Belief in some quarters that more stream gauges are not necessary as the records can be generated by models.
- Maintenance of the status quo as the “best case” rather than leading a drive to expand and improve the network in response to concerns regarding water management and climate change issues.
- Lack of progress in incorporating non-integrated data (data collected by other organizations) into the hydrometric program database.

While these outcomes reflect the management of the network over the past decade, the future is more promising, with a renewed interest by governments and the private sector in making improvements to the hydrometric network.

Nevertheless there are challenges in making improvements to the network particularly in working with the non-integrated data. There has been a tendency for some organizations to be unwilling to share data and to minimize the data they collect to meet their own immediate needs. Standards and quality assurance are other issues that need to be addressed.



The current management framework for the BC Hydrometric Program was provided by BC Environment and is shown above. There are Provincial partners such as BC Hydro and the GVRD who fund stations for their direct needs and these stations are managed as part of the WSC network. This organization illustrates the challenge for data users to influence network decision making. The Provincial partners such as BC Hydro and GVRD have input to decisions regarding stations that they fund but do not have input to strategic decision making and general network issues. There is no formal process for participation in overall network management by data users outside Environment Canada and BC Environment.

A Business Review of the BC Hydrometric Programs was carried out in 2003 (Azar, Sellars and Schroeter, 2003) on behalf of the BC Government. Two key recommendations arising from the review were as follows:

Recommendation One: Provide the Leadership to Move Forward

Leadership is the biggest challenge facing the program. Strong, dedicated leadership is essential to implement the changes required to turn existing hydrometric operations into an effective comprehensive program. The government service delivery organizations need executive-level leadership to consolidate and enhance their funding and to enable staff to focus on meeting user needs. Leadership is also required to pull together the large diverse user community and encourage it to support the program in proven and innovative ways.

Recommendation Six: Move Towards a New Institutional Structure

There is a need to develop a suitable institutional arrangement to coordinate the diverse user and service delivery community in collectively managing and supporting the renewal and development of the hydrometric program. There is a need for a common organizational focal point where all players can come together for the overall well-being of the program and the essential business needs. Unless representatives of the major users and service providers work together, the state of the hydrometric program will continue to deteriorate. The first step is the creation of a management board that will develop a step-by-step renewal plan for the hydrometric program. The management board will take the lead in promoting the hydrometric program renewal and building the partnerships that will provide the program's long-term funding.

An Executive Forum of data users was held in November 2003 to address the recommendations arising from the Business Review. There was very strong interest expressed at the forum in establishing an organizational entity to oversee the management of the hydrometric programs. It was concluded that while all user groups could participate in a general council, a management group would be required to lead development of policy, planning and funding issues. This group should be a board-of-directors type entity (not just an advisory group) and focused at the strategic level. To be effective, it must have authority to make decisions and authorize direct action. The board could meet three to four times a year to deal with the major issues stated in the preamble and work to provide stability to the collection and provision of hydrometric data. Working groups operating under the board of directors would likely be necessary for specific issues such as data capture and management and funding vehicles. Other items the board would need to address are communication of the value of supporting the network and recognizing and re-engaging undefined stakeholders.

In March 2005, a BC Hydrometric Program Governance Workshop was held to try and move the issue forward. The workshop was inconclusive and led to the formation of Water Highway BC (WHBC) as an organization to represent data users and advocate improvements to the management of the hydrometric program. WHBC has suggested that the immediate need for improved water management in the Okanagan represents an opportunity for an initial pilot project for the implementation of the Provincial hydrometric program renewal process.

Options for an improved hydrometric program

The hydrometric program has a complex management structure that is complicated by the several layers of government that are involved. One aspect that does simplify discussions is that the day-to day operation of the program is essentially sub-contracted to Water Survey of Canada. In the interests of maintaining national standards and practices, that sub contractor role should continue even if the overall management of the program changes.

Discussions on changes to the management and governance of the network inevitably get bogged down in overcoming the current complexity of the program management and trying to resolve issues that could best be left to a follow-up group. The *Future of Water Quantity Information Workshop* should attempt to maintain a high-level strategic perspective focused initially on making changes in the Okanagan. This could be followed by an assessment by the workshop of how such changes could be applied across the Province. In essence, there are three main options for improvements to network management in the Province:

1. **Advisory Committee**: Form an Advisory Committee of data users to improve communication with the Network Administrators and Network Coordinators. There could be a single Advisory Committee for the Province with Advisory Sub-Committees for regions such as the Okanagan Basin. There could also be Advisory Sub-Committees for sector representation such as forestry or mining. An initial step for the Okanagan would be to establish an Advisory Sub-Committee for the region which would periodically meet with the Network Administrators to discuss network issues.

   Advantages: Relatively easy to implement.
   Disadvantages: Does not provide stakeholders outside the existing management structure with anything but an advisory role.

2. **Advisory Board:** Establish an Advisory Board for the program that would receive reports from the Network Administrators, meet on a regular basis and provide advice to the program. The Advisory Board would have regional and sector representation. An initial Advisory Board could have representation from the Okanagan either on a regional or sectoral basis with other members of the Board comprising the existing partners in the program. Additional Board members could then be added as part of a Province–wide implementation plan.

   Advantages: A more formal structure than Option 1 with better reporting and a stronger advisory role.
   Disadvantages: Recommendations of the Advisory Board may not be followed by the Network Administrators. The program would still be susceptible to political whims of the major partners.

3. **Management Board:** Reorganize the management of the hydrometric program with significant representation from the data users. The management of the hydrometric program could be structured in different ways but would likely include a Board of Directors composed of the major partners such as Environment Canada, BC Environment, BC Hydro, funding partners such as GVRD, regional representatives and sectoral representatives. The Board would provide strategic direction to a Management Group who would be responsible for directing WSC in the day-to day operations. A possible transition step to this option would be to first establish an initial Advisory Board (Option 2) with representation from the Okanagan either on a regional or sectoral basis with other members of the Board comprising the existing partners in the program. Once the Advisory Board was established, the intent would be to migrate to Option 3.

   Advantages: Provides data users with significant input to network management decisions and a framework for raising the profile of the network through marketing and communication. This is the option preferred by WHBC as it would provide the network with a stable and sustainable management structure.
   Disadvantages: The most challenging option to implement as it would require integration within the framework of the existing Canada-BC Agreement for network management.

The elephant in the room

Discussions on making changes to the organization of the hydrometric program frequently become conflated with funding issues. Clearly the Provincial government has an interest in stakeholders bringing new funding sources to the hydrometric program. On the other hand, WHBC considers that the hydrometric program is the business of government and should be funded by general revenue given the wide ranging benefits of the program across so many interests. Businesses in the resources sector and communities in the Province are already paying for the hydrometric network through existing taxation.

Nevertheless, the current model for funding of the hydrometric program has basically failed. Increasing the participation of data users from the Okanagan in any of the three options outlined above could result in one or both of the following outcomes;

- Increased funding from the Province based on clearly articulated needs from the Okanagan region through a formal communication vehicle (Advisory Committee, Advisory Board or Management Board).

- Enhancements to the network in the Okanagan Basin with new stations funded from local sources. (Essentially the GVRD model for site-specific stations but with a larger number of funding participants)

Objectives of the workshop

It is suggested that the Workshop on the *Future of Water Quantity Monitoring in the Okanagan Basin* address the following questions:

1. Does the current hydrometric network in the Okanagan meet the needs of water planning and management in the region?

2. What are the options for data users in the Okanagan to participate in the BC Hydrometric Program?

3. What is the preferred relationship of data users in the Okanagan to the BC Hydrometric Program given the range of options considered?

    - Advisory Committee
    - Advisory Board
    - Management Board
    - Other options identified by the workshop

4. For the preferred option identified by the workshop, are there opportunities for an intermediate regional structure for the Okanagan to participate in network management that could eventually lead to a Province-wide reorganization of the program?

5. What process could be used to capture the non-integrated data and incorporate it into the hydrometric program without compromising the quality of the existing database?

6. What is the appropriate next step and overall process to achieve the preferred option for improved network management?

REFERENCES

Azar, J, D. Sellars and D Schroeter, 2003. Water Quantity Monitoring in British Columbia: A Business Review of the BC Hydrometric Programs. Report to Ministry of Sustainable Resource Management.

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Sellars, D and R. Smith, 2005. Application of the Water Use Plan approach to resolve water management issues on Trout Creek in Summerland. Proceedings of the CWRA 2005 Kelowna Conference: Water-Our Limiting Resource.

BIO

David Sellars has been an advocate for improvements to the BC Hydrometric Network for the past 20 years. He has written frequently in professional publications on hydrometric network issues including an editorial in the Canadian Water Resources Journal in 1989. He was a co-author of the Business Review of the BC Hydrometric Programs published in 2003 and a founder member of Water Highway BC (WHBC), an association formed to represent the interests of users of the hydrometric network. He has worked extensively in the Okanagan Basin and recently managed the preparation of the Water Use Plan on Trout Creek for the District of Summerland. He is a Principal of Water Management Consultants and a Director of WHBC.

Appendix D: Non-integrated Data Presentation by Tony Cheong

Ministry of Environment

Non-Integrated Information; Challenges and Opportunities

June 28, 2007
Tony Cheong
Water Stewardship Division
Ministry of Environment

Ministry of Environment

What is "non-integrated" information

- Refers to hydrometric information collected outside of the Canada-BC network
- Typically has a specific purpose (project, use)
- Collected by consultants, industry and government staff

Ministry of Environment

The Issue

- Identified in the Hydrometric Business Review as important to meeting hydrometric information needs
- Can help fill in "gaps": e.g., local or smaller watershed information needs
- This type of information is not readily accessible

Ministry of Environment

Challenges

- Varying standards for data collection
  - current RISC standards onerous
  - lack of awareness
- Collection and capture
  - no effective central, accessible repository
  - not all meta-data captured
- Ownership: may benefit competitors

Ministry of Environment

Towards a Solution

- Improved Standards:
  - streamlined process, less onerous
  - 2 limited reviews, broad review in fall
  - less prescriptive, provides information required for interpretation
- Improved Data Management
  - improvements for data submission, QA, reporting

Ministry of Environment

Opportunities

- Improved Awareness
  - link standards and data submission to programs: e.g., Forest Investment Account (FIA); government operations; OBWB programs
- Integrate with Canada-BC network: e.g., priorities
- Other?