ORGANIZATIONAL ARRANGEMENTS FOR WATERSHED GOVERNANCE ON

VANCOUVER ISLAND: A FOCUS ON REGIONAL GOVERNMENT ROLES AND

RELATIONSHIPS

by

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Abstract

The nature of water being cross-jurisdictional, vital, and not constrained by political boundaries, underscores the importance of arranging the organizations that make and influence decisions about watersheds in a way that meets complexity with resilience. This research — through interviews, network mapping, grounded observation, and literature review —— investigates the experiences of various organizations within three Vancouver Island case study areas: Alberni-Clayoquot, Nanaimo, and Capital regions. Using a social-ecological systems lens focused on the system as a whole, inclusive of the organizations and the ecology, this study explores what organizational arrangements can support sustainable context-driven watershed decision-making. The results point to key principles for organizational roles and relationships concerning watersheds, including: multiplicity, capacity, forums, and reciprocity. Niches for regional government in a multi-level framework also emerged, such as: bridging to community; exercising some regulatory authority and influence; establishing reliable long-term funding mechanisms; convening across levels of government; and supporting First Nations leadership.

Keywords: watersheds, organizations, regional government, social-ecological systems, complexity, governance

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Introduction

Wherever you are, you are in a watershed. Watersheds are ecological landscape units defined by topography and hydrology, where precipitation drains to a common river and infiltrates to associated groundwater aquifers. Water facilitates connectivity across the landscape including through the upstream-downstream interaction inherent in the watershed system (Prager & Pfeifer, 2015). Within the context of watershed landscapes there are interdependent social and ecological networks that are collectively reliant on the quantity and quality of shared water sources. The dynamic linkages between the social and the ecological / physical attributes in a watershed ultimately influence the resilience of the natural and human systems (Prager & Pfeifer, 2015). From an Indigenous perspective, watersheds are also living beings — the interconnected lands and waters we as humans are a part of, not superior to (FN1).

In British Columbia, watershed management jurisdiction and authority is fragmented and complex. Its system of governance could be described as multi-level, where multiple actors interact at multiple administrative levels — local, regional, provincial, federal — across multiple scales of geographic space (Nunan, 2018; Berkes et al., 2014). It has been influenced by a legacy of colonial conceptions that understand the interface of land and water as a technical, mechanistic, and controllable system (Jatel, 2013; Pahl-Wostl, 2002) rather than a living system. The existence of many institutions, organizational levels, and actors makes it difficult to navigate who is accountable and where coordination within a given watershed should occur.

On Vancouver Island in particular, the watersheds are characterized by short distance from mountain top to sea, with forestry activities in the upper elevations, agriculture and rural

residential land use in the mid-elevations, and urban communities and transportation corridors along the coast. The climate is generally considered Mediterranean on the east and south coast of the Island and temperate rainforest on the north and west coast of the Island. Generally, Vancouver Island is known for its wet but mild winters and dry summers. However, the impacts of climate change are rapidly manifesting on Vancouver Island, as changes in the water cycle experienced through longer, hotter, drier summers, through increasing extreme rain events in the fall, and through milder temperatures at elevation resulting in decreased snowpack accumulation in the mountains (Cowichan Valley Regional District, 2017). Vancouver Island communities and ecosystems feel this change through increasing wildfire risk and occurrences, low streamflow levels and groundwater tables earlier in the year and for longer durations affecting agricultural crops and aquatic ecosystems, and flooding and landslides during extreme rainfalls. This describes what has been happening in recent years and what is projected to continue, as climate models show an average increase of about 3 degrees Celsius by the 2050s (Cowichan Valley Regional District, 2017). The International Union for Conservation of Nature (IUCN) states that "climate resilience is strengthened through healthy ecosystem services that rely on well-functioning river basins" (2015, para. 1). Building climate resilience and reducing vulnerability relies on a "combination of watershed management, sustainable infrastructure, empowerment and learning through adaptive institutions" (IUCN, 2015, para. 5). Climate impacts are manifesting concurrently with other stressors on our lands and water, including resource extraction and land development. In the Vancouver Island context, this primarily takes the form of forestry and urbanization.

Given the climate change-related stressors including seasonal water scarcity and flooding, there is an urgency placed on local communities to prepare and respond effectively through adaptation and mitigation. The nature of water being cross-jurisdictional and not constrained to neat political boundaries further underscores the importance of arranging the organizations that make decisions about our watersheds in an innovative and adaptive way that can meet that complexity with resilience. As stated in Mancilla-Garcia et al. (2019): "The interconnectedness of water resources across local and regional scales magnifies the need for integrated governance approaches that account for interdependence within coupled social-ecological systems, specifically across political and hydrologic boundaries" (p.1). This highlights the importance of aligning land and water governance with the watershed scale, in that by managing water resource according to the unit of an ecosystem rather than political-administrative boundaries, watershed governance can address the interdependencies between upstream and downstream effects, water quality and water quantity, and water and land-use practices (Moss, 2004 in Medd and Marvin, 2008). This is often referred to as "spatial fit" or "governance fit" (Berdej et al., 2016). Importantly, note the focus placed on the watershed as opposed to solely the water, as the watershed encompasses both the land and the water and more aptly describes the interconnected social-ecological system of interest. Essentially, in my view that carries through this research, when thinking about water sustainability one cannot remove the water from its relationship with the land, and the relationship that people have with both.

I am using a social-ecological systems (SES) framework as a starting point of analysis, which situates attention on the prospering of the system as a whole, inclusive of the organizations and the ecology (Baudoin & Arenas, 2018). Elinor Ostrom (1990; 2009) has

provided evidence in her body of research that a key variable in SES sustainability is the self-governing capacity of local communities and organizations; when communities benefit directly from their own stewardship actions or restraint of resource use, they will be more driven to initiate and engage in collective sustainable action to protect the ecological (resource) systems they are embedded within. Understanding the logic, design, and performance of the experiences of organizations within three regions on Vancouver Island through an SES analysis lens aims to illuminate connections and institutional responses to watershed sustainability challenges, which could inform further intentional organizational design in these and other regions where applicable.

Research Question and Objectives

The purpose of my research is to investigate the question: *What types of organizational arrangements can support sustainable watershed decision-making in the Vancouver Island context?* A secondary question is: *In particular, what niche(s) do regional governments fill in the organizational arrangements for watershed governance within different social-ecological contexts?*

By investigating organizational arrangements, the intention is to better appreciate the structures and processes shaping water governance outcomes. Zurita et al. (2018, p. 3), define organizations as material entities that typically operate as actors in social practices and governance contexts. They go on to describe that organizations and institutions have a dialectical relationship and that "institutional forms are emerging and shaping water-related actions and that water and water events shape institutions and organizations in return" (Zurita et al., 2018, p. 3). Institutions are understood to be the "systems of rules, decision-making procedures, and

programs that give rise to social practices, and guide interactions among the occupants of relevant roles" (Zurita et al., 2018, p. 2). My research is focused on the organizations involved in watershed decision-making and how these organizations relate to each other and arrange themselves in the water governance ecosystem in each local context, with the recognition that institutions (rules and procedures) are integral influencers to how organizations operate. Arrangements refer to roles and relationships that must be fulfilled for watershed governance systems to achieve sound integrated water resource management practices, and how those roles and relationships are assigned or coordinated. This is inclusive of all institutional actors involved in managing watershed resources, including citizens, organizations, and private entities, not just government (Global Water Partnership, 2018).

Through this inquiry I identify, within three different regions on Vancouver Island, what organizational arrangements currently exist, what perspectives actors within organizations that work on watershed issues have regarding the roles and relationships between them, and whether sustainability outcomes are being met to protect watershed health and function in a changing climate. My research probed within these three distinct social-ecological systems for instances of cross-jurisdictional collaboration, with a focus on organizational arrangements that align with integrated watershed management. Integrated watershed management is understood as an important measure for a) resilience to hydrological climate change impacts, b) integrating land-use planning and water management, and c) implementing sustainable development principles (IUCN, 2015; Global Water Partnership, 2018). This research explored opportunities for, and challenges to, collaboration *within* agencies, and *between* agencies, organizations, and actors. Ultimately the goal is to identify pathways to transform organizational arrangements to respond

to water sustainability challenges through effective governance at the watershed scale on

Vancouver Island, with an eye to the unique roles and relationships of regional governments in

the various SES contexts.

In BC, regional districts are part of the local government system; they are federations of

municipalities and unincorporated areas that provide "regional governance and services, an

administrative and political framework for inter-municipal and sub-regional service partnerships,

and act as a local government for the unincorporated areas (electoral areas)" (Aitken, 2014, p.6).

This level of government is of particular interest in the context of watershed governance from the

perspective of spatial fit, as regional districts are more geographically aligned to "natural

regions" (Chadwick, 2002, p. 13) and include full watershed areas or basins, as opposed to

municipalities which often only encompass portions of watershed(s) and often source their

drinking water outside their municipal boundaries (see for example City of Nanaimo). At the

same time, they are much more proximal to the local community than the provincial level of

government. Personally speaking, my interest in the regional level of government and its role in

watershed governance also comes from my professional experience working on the front lines of

a regionally-led watershed program, at the Regional District of Nanaimo (RDN).

Due to my position, I am considered an 'insider 'on this research topic. My career to-date

as the Program Coordinator for the RDN's Drinking Water and Watershed Protection service has

given me many experiential insights on collaborative organizational arrangements that are

unique in BC. That background has situated me in a unique position to further investigate the key

ingredients of organizational arrangements in the context of the RDN, and to access and deeply

query key actors within the social and ecological systems of which I am a part and with which I

am intimately familiar. This Master's research provided me the opportunity to, through the academic process, investigate, reveal, and validate governance arrangements related to watershed protection and restoration for practical application in effective watershed decision-making more broadly on Vancouver Island.

Coming into this research, I documented my perspectives as a way to identify my preconceptions and bias, which I share here. At the outset, it was my view that the regional level of government is uniquely suited to serving as a hub for watershed governance initiatives. Regional government is close enough to the communities and grassroots organizations to get a sense of what matters and is important in the local context. At the same time, regional government has sufficient authority to be a credible partner to senior government and industry. Regional governments manage water infrastructure and land-use planning including zoning. On top of all this, regional government also has the ability to requisition taxes to support long-term programs and services. I felt organizational arrangements that include a regional government body that has dedicated resources to watershed governance and management would produce better results for the sustainability of regional water sources and ecosystems over the long term. My experience dictates that this requires high levels of collaboration with provincial government ministries, municipalities, community organizations, and industry. Each of those organizations has an important role and niche as well. But my original view was that the process of convening these organizations to engage in watershed initiatives, seemed to be best suited to a well-resourced regional government program. Through my research, however, I have discovered that what is "best" depends very much on context and that having a multiplicity of roles and organizations involved is important for sustainable and regenerative outcomes.

This introduction has described the research question and my positionality as a researcher, and has situated this study in the domains of social-ecological systems, multi-level governance, and integrated watershed management. Next, each of the three case study regions I have selected for my research — Alberni-Clayoquot Region, Capital Region, and Nanaimo Region — are introduced to set the scene for these unique social-ecological systems. I then proceed to describe my research methods before presenting my results. Discussion and conclusions follow, to synthesize the findings that have emerged and to posit next steps.

Research context

Water governance has been a topic of increased interest in BC leading up to and flowing out of the provincial *Water Sustainability Act*, which came into force in February 2016. While there have been several publications and studies analyzing water governance best practices in BC (see POLIS Water Sustainability Project publications at poliswaterproject.org/publications/ in particular), there has not been a significant body of research to-date on the specific water governance implications at the local or regional level, nor an accompanying organizational framework for Vancouver Island communities and watersheds, given the emerging operating context of the new legislation. By examining existing organizational arrangements for water governance and management, my research can provide insight into potential implementation opportunities and barriers at a more localized level. I do not examine policy directly; rather, I explore the timbre of the organizational relationships in this space, to offer a rich picture of possibilities for area-based, locally grounded watershed decision-making.

Case Study Areas

I have chosen to base my research in three regions on Vancouver Island, as shown in Figure 1 below: Alberni-Clayoquot Regional District (ACRD) on the west coast, the Regional District of Nanaimo (RDN) on the east coast, and the Capital Regional District (CRD) at the southern tip of Vancouver Island. These geographical areas align somewhat with watershed boundaries, but are delineated based on political boundaries assigned to Regional Districts, a local government entity, by the government of BC. I have decided to frame my research in this context, given my particular interest in the roles and relationships associated with regional government in watershed governance and management, as well as the alignment with natural hydrological drainages.

Figure 1

Map of the Three Regional District Case Study Areas on Vancouver Island

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community © 2020.

George and McKeown (1985), writing on case study research, describe it as appropriate

for the researcher to select cases that differ from one another on some dimensions judged as

significant by the researcher (p.25). The rationale for choosing these three cases is that this

selection represents a diversity of social-ecological contexts within the scale of Vancouver Island

— west, east, and south coasts and small, medium, and large relative populations. Further, there

are many notable features to compare and contrast, some of which are as follows. First, the

ACRD and RDN both have designated UNESCO Biosphere organizations located within their

region[1] — this provides an interesting arrangement to investigate and compare across regions within the context of watershed decision-making. Secondly, the CRD owns the land surrounding their regional drinking water supply watershed, while the ACRD and RDN do not have a regional water supply system and instead have many water systems, some run by municipalities, others run by the regional government, and yet others run by Improvement Districts. Those regions have multiple drinking watersheds and by and large, private forest companies own the land (except for outside the Alberni portion of the Alberni-Clayoquot region). I expand on the unique, high level contexts and characteristics of each case study region, next.

Nanaimo Region. This region is presently home to over 155,000 people and is within the traditional territory of the Coast Salish peoples. First Nations communities with reserve lands within the regional district boundaries include the Qualicum First Nation, Snaw-naw-as First Nation and Snuneymuxw First Nation. The region includes four member municipalities: Town of Qualicum Beach, City of Parksville, District of Lantzville and City of Nanaimo, the latter being largest by far with approximately 90,000 residents. Outside these municipal areas are unincorporated rural communities that comprise seven Electoral Areas. The region has seven major basin scale watersheds (known in regional planning documents as 'Water Regions') including one Gulf Island group (Gabriola, Mudge and Decourcey). Groundwater is the primary drinking water source for residents in the region with the exception of the City of Nanaimo; its community tap water source is surface water from the south fork of the Nanaimo River. The upper elevation areas of the region are largely forestry resource lands, specifically privately

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[1] In the Regional District of Nanaimo there is the Mount Arrowsmith Biosphere and in Alberni-Clayoquot Regional District there is the Clayoquot Biosphere, each with their unique own governance structure and organizational focus. These are the only two designated UNESCO Biospheres on Vancouver Island.

owned timber holdings, a result of a colonial land grab on Southeastern Vancouver Island by the Federal Government, who transferred that land — Hul'qumi'num land, unceded and not settled by treaty — to private entities, in exchange for the building of the Esquimalt & Nanaimo (E&N) Railway in 1887, extending between Esquimalt and Campbell River (Hul'qumi'num Treaty Group, n.d.).

Presently, the majority of this land is owned by one company, Mosaic Forest Management. This privatization of vast tracts of forest land is a unique arrangement in the Province, with forest lands elsewhere in BC primarily being administered as Crown land, but nevertheless largely unceded by Indigenous peoples to this day (Indigenous Corporate Training, 2014). Private forest land in BC operates under its own legislation, the *Private Managed Forest Land Act* (PMFL). This is a voluntary designation that, while encouraging forestry practices to follow guidelines for non-timber values such as soil, wildlife, and water, gives the private companies a high degree of latitude with minimal oversight of their land management (Environmental Law Centre UVic, 2019, p. 9).

The middle and lower watershed elevations of the Nanaimo region are dominated by rural residential and agricultural, and semi-urban land uses, respectively. These mid- and lower watershed areas fall under the land-use planning authority of the Regional District and municipalities. A critical milestone in the region's present-day watershed governance story comes in 2008, when a new Regional District service area was established by elector assent gained via referendum: the Drinking Water and Watershed Protection (DWWP) service. This created the ability for the Regional District to requisition taxes specifically to fund the implementation of their newly developed Action Plan for drinking water and watershed

protection in the region. The Action Plan was developed in collaboration with a multi-stakeholder, multi-agency advisory group, and focused on watershed education, monitoring, and planning support. This novel arrangement to fund a service to deliver outreach, science and policy advocacy related to water sustainability was the first of its kind in BC, only somewhat comparable to the multi-region Okanagan Basic Water Board, at the time of establishment. The creation of this DWWP service was driven by pressures facing the region, including population growth (increased water demand), climate change (water shortages), and cross-jurisdictional challenges in water and land management. This service acts as a hub for collaboration across the region with various levels of government, community, industry, academia, professionals, and environmental non-governmental organizations (NGOs).

Another unique organization within that region is the Mount Arrowsmith Biosphere Region (MABR), founded in 2000 and recently re-established under the administration of Vancouver Island University in 2014. The scope of this UNESCO-designated organization includes approximately 1200 square kilometers and comprises five watersheds: Little Qualicum River, Englishman River, French Creek, Nanoose Creek, and Bonnel Creek (Mount Arrowsmith Biosphere Region, n.d.). Their mandate is to coordinate participatory research in support of sustainability within the Biosphere region.

Generally speaking, the ecological status within the RDN's watersheds varies depending on location. Two of the major rivers have concerns with endangered salmon runs: Nanaimo River Chinook and Englishman River Coho and Steelhead (G2). Other systems have thriving salmon runs (Nile Creek chum) and yet others have seen recent recovery (Beach Creek, Departure Creek). While there is no biodiversity report to refer to for the region, there is a

regional water budget report (Waterline Resources Inc., 2013) that summarizes water supply and demand and relative stress across the region's surface water bodies and aquifers. There is also a subsequent State of our Aquifers report (Regional District of Nanaimo, 2017) and Surface Water Quality Trend Analysis report (Plewes et al., 2018) which each partially summarize the status of water resources in the region against relative quantity and quality metrics. Suffice to say, some areas are regularly experiencing seasonal water shortages while others are not. And some areas have demonstrated recurring water quality concerns and deteriorating quality from natural and anthropogenic sources, while other watercourses have good and stable water quality and a few are even improving.

Alberni-Clayoquot Region. From the western facing slopes of Mount Arrowsmith and the Beaufort Range, down into the valley of Port Alberni, extending along the west coast of Vancouver Island from Bamfield in the south, through Ucluelet and Tofino, up to Hesquiaht Boat Basin, the Alberni-Clayoquot Regional District (ACRD) comprises over 6500 square kilometers, with a population of approximately 31,000 (Statistics Canada, 2016). This is Nuu-chah-nulth territory of ten First Nations, four of which are Treaty Nations: Huu-ay-aht, Yuułuʔiłʔatḥ, Uchucklesaht Tribe Government, and Toquaht Nation. The ACRD includes three member Municipalities: Port Alberni, Tofino, Ucluelet, and six unincorporated Electoral Areas. Within this vast area of land there are many watersheds, some of the major ones being Kennedy River, Somass-Stamp-Ash Rivers, and Cherry Creek. The old-growth forests, steep slopes with high annual precipitation volumes, rugged coastline, and salmon-bearing rivers are the defining ecological features of this area, as well as the agricultural lands in the relatively warmer and drier Alberni Valley. There are some private forest lands surrounding Alberni, but the majority of the

region's forestry is managed by the Province through Tree Farm Licenses (TFLs) with an increasing presence of First Nations timber holdings and land ownership. As described by one of my interviewees, the "whole pattern of old growth forests… really is such a key variable for this region in terms of watershed protection or watershed management" (NG5).

An important milestone in the watershed governance timeline within this region was the creation of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound following a Provincial land use decision in 1993 aimed at resolving conflicts between logging operations and First Nations as well as environmental activist groups (Spiro, 2003). The Scientific Panel included scientists and representatives from the Nuu-chah-nulth Central Region First Nations, who were tasked with developing recommendations for sustainable management of Clayoquot watersheds, based in ecosystem management principles and traditional ecological knowledge (Clayoquot Sound Technical Planning Committee, 2006). Concurrently, a community-based Central Region Board (CRB) was established as a co-governance body to review all land use proposals and watershed planning on behalf of the Province and the Central Region First Nations Chiefs (Spiro, 2003). This was created as part of an "Interim Measures Agreement" which was intended by the Province to be a precursor to treaty, but after several renewals between 1995 and 2008, the CRB was dissolved in 2009 (Dart, 2009). The watershed plans created through that process are still in play today, although new dynamics are emerging with: recently signed treaties for Yuułuʔiłʔatḥ and Toquaht First Nations; Ahousaht First Nation developing its own land use plan; the Tla-o-qui-aht First Nation pursuing the establishment of Tribal Parks; and the BC government signing Bill 41, which mandates that provincial laws align with the UN Declaration on the Rights of Indigenous Peoples, as a framework for reconciliation and a pathway to

Indigenous communities' self-determination (Province of BC, n.d. -a). The CRB era spawned

some of the unique organizations that continue to work within the region today, including West

Coast Aquatic and Clayoquot Biosphere Trust.

Water supply for the municipality of Port Alberni comes from a system connected to

China Creek, which was described by an interviewee from that area as having "a good water

supply in terms of quantity and is resilient through drought" (G3). In the rural areas outside Port

Alberni, people are on groundwater wells and private surface water intakes and have reportedly

had some issues with water quality in terms of turbidity and sediment from upstream activities

such as logging (G3). Water quality issues in the region extend to Sproat Lake, a popular

recreational waterbody that has experienced algae blooms, and Stamp River, which experiences

high turbidity every time it rains, to the point where the Beaver Creek community had to stop

pulling water from it and connect with the City's China Creek system instead (G3).

Water supply for the District of Ucluelet comes from groundwater wells and a secondary

creek supply, and has experienced ongoing turbidity issues of its own, which has prompted

discussion on a potential regional water supply source at Kennedy Lake. However, the priority

for the municipality at this point is to upgrade their existing water system to have additional

storage and filtration (Bailey, 2020), as a regional water system at Kennedy Lake requires

significant investment and is complicated by ecological and cultural interests that necessitate

Tla-o-qui-aht First Nation's involvement as rights holders in this area.

Tofino's drinking water, as described on their website "is collected with gratitude from

the rainforests protected by the Tla-oqui-aht Tribal Parks in the Huahuulthii of the Tla-o-qui-aht

Ha'wiih" (District of Tofino, n.d.). In other words, the tap water comes from four creeks on

Meares Island in the territories of the Tla-o-qui-aht hereditary chiefs. In the drier summer period that corresponds with peak tourist season, this water supply can come under stress, and even in a rainforest they are not exempt from seasonal drought: the municipality has had to truck in water and implement heightened water use restrictions in recent years because of this.

Ecologically, the status of the watersheds in this region may appear to the outsider as pristine compared to more urbanized areas. But relative to themselves, the watersheds in this region are, as stated by one interviewee, "in a state of critical unwellness" (FN1). This relates to salmon as the benchmark for health within west coast communities and wild salmon populations are in decline. Generally speaking, there is concern around water quality related to logging practices, both from legacy impacts of historical forest harvesting practices as well as current impacts, including: sediment input, insufficient riparian buffers to mitigate water temperatures, and structural impacts to streams preventing fish from surviving and impacting biodiversity (NG2). Another interviewee described that "from a biological perspective, watershed health is poor, but from an anthropocentric perspective not as bad. But it's so different in different areas". (NG2).

Capital Region. The Capital Region is the area including and surrounding the Provincial capital of Victoria BC. It covers 2,340 square kilometers of land (Statistics Canada, 2016), includes 13 municipalities and three electoral areas, and is home to more than 418,000 people. It is the most urbanized area on Vancouver Island but also has a significant agricultural land base, primarily out on the Saanich Peninsula and in outlying rural areas such as Metchosin. It also includes some of the Southern Gulf Islands, the largest of which is Saltspring Island. The region resides in the traditional territories of the Nuu-chah-nulth and Coast Salish peoples, which

includes approximately 20 First Nations, 11 of which have reserve lands and nine of which have settlement populations made up of over 4000 members (CRD, n.d. -c). This includes the Songhees, Esquimalt, Tsartlip, Pauquachin, Tsawout, Tseycum, Sc'ianew, T'Souke, Pacheedaht, Malahat and Penelekut Nations. There are hundreds of watersheds that comprise the region, some of the most notable urban drainages being the Colquitz River, Bowker Creek, Craigflower Creek, Colwood Creek; agricultural watersheds such as Tod Creek, Bilston Creek, Hagan Creek; and drinking water supply area watersheds including Sooke River and Goldstream River that are primarily forested headwaters as well as the future water supply area of the Leech Basin. The CRD, uniquely, owns the land surrounding its regional drinking water supply area and provides tap water from this source to 370,000 people in Esquimalt, Oak Bay, Saanich, Sidney, Victoria, Colwood, Langford, Metchosin, View Royal, Sooke and parts of the Highlands and East Sooke Electoral Area. In the recent acquisition of additional watershed area in the Leech basin for expanding future water supply, CRD purchased the land from private forestry, a contrasting arrangement with the other two case study areas, where the tax base does not produce revenues sufficient for land purchase on that scale (CRD, n.d. -b). The regional government operates a watershed protection division that provides forest land management including care of the roads and managing wildfire risk, as well as managing access the areas which are closed to the public as a protection measure (CRD, n.d.-a).

From a drinking water perspective, the Capital Region is in the fortunate position of having an abundant water supply of a high quality. The main challenge is around anticipated future climate change impacts to precipitation patterns and temperatures that can affect water supply, water quality, and health of the watershed forests in the regional supply area. The

southern Gulf Island areas and rural communities that are not serviced by the Regional Water

Supply are, however, already faced with challenges in water quality and quantity, for example

Saltspring Island and the Highlands, for both surface and groundwater, respectively. Outside of

the regional drinking watersheds, the main watershed challenges are to do with urbanization,

polluted run-off and agricultural impacts (CRD, 2017). The CRD's Bowker Creek initiative is a

great example of watershed management in an urban context, looking on a 100-year horizon to

plan for ecological restoration and daylighting piped creeks.

Methods

Comparative Case Study

Yin (1981) describes a case study as a research strategy that "attempts to examine a

contemporary phenomenon in its real-life context, especially when the boundaries between

phenomenon and context are not clearly evident" (p. 59). Flyvbjerg (2006) asserts that case study

research is also essential for the development of "understanding the degree to which certain

phenomena are present in a given group or how they vary across cases" (p. 241). In case

comparison, multiple cases serve as sites for extension or surfacing of theory through an iterative

analysis of each case, culminating with final comparison of emergent themes and explanations

(Mills et al., 2010-b, p. 175).

Using a case study approach has allowed me to analyze the RDN experience using a

structured analytical framework to further illuminate what I have begun to observe through direct

experience. Further, a comparative case study approach extends my analysis to other social-

ecological contexts, to contrast and compare organizational arrangements in two other Vancouver Island regions, with their unique attributes.

Data Collection

Data gathering for this research involved extensive literature review, as well as interviewing 18 representatives from organizations involved in watershed governance or management in any or all of the three case study areas.

Literature review. My data collection and methodological procedure began with completing a literature review using the Royal Roads University Discovery and Library Databases of the intersecting domains of *Governance, Social-Ecological Systems,* and *Integrated Watershed Management*, to establish an analytical framework and select the variables for comparison. Next, I completed a grey-literature scan of local government and community documents, articles, and websites to identify key organizations at work within the RDN watersheds, the CRD watersheds and the ACRD watersheds. This was iterative, and further developed based on interview feedback. This process enabled me to select my interview candidates and establish the high-level context of the three case study areas.

Interviews. My primary data collection was performed by interviewing key actors from a purposive sampling (Lewis-Beck, Bryman & Liao, 2004) of three sectors in each of the case study regions: government (all levels), industry (focus on forestry and agriculture), and civil society (stewardship groups, NGOs). The aim was to interview individuals in the organization that could speak to a higher-level organizational view and had some purview over watershed governance-related activities such as convening, facilitation, data collection, restoration, education, and regulation or direct land / water management. As mentioned above, the

participants were selected based on a grey-literature and website scan, my existing knowledge of organizations that operate in this space, as well as suggestions from interviewees. Some interviewees overlapped case study areas, for example forest industry and provincial government representatives that operate in watersheds across the case study regions. Further, a couple of desired interviewees were unavailable, in particular two NGOs in the Capital region, namely Peninsula Streams and Habitat Acquisition Trust. Thus, a total of 18 semi-structured, open-ended interviews (Dilley, 2000) were conducted between February 28, 2020 and December 8, 2020, as summarized in Table 1. At first the interviews took place in person, however with the onset of the pandemic COVID-19 in March 2020, interviews were subsequently moved to a virtual format in Zoom. Each interview was approximately 90 minutes in length and recorded with the participant's consent.

Table 1

Summary of Interviews by Case Study Region

Organization	Sector	Identifier(s)	Alberni-Clayoquot	Capital	Nanaimo	All / Multiple
Ministry of Environment	Gov't	G1, G7				(2)
Ministry of Forests Lands Natural Resources	Gov't	G5				
Department of Fisheries and Oceans	Gov't	G4				
Department of Fisheries and Oceans	Gov't	G2				(1)
Regional District of Nanaimo	Gov't	G9				
Alberni-Clayoquot Regional District	Gov't	G3				
Capital Regional District	Gov't	G6, G8		(2)		
Agricultural Support Worker	Industry	IA2				
Private Forest Management Company	Industry	IF1				(1)
Maaqutusiis Hahoulthee Stewardship Society	First Nations	FN1				
Central Westcoast Forest Society	NGO	NG2				
Clayoquot Biosphere Trust	NGO	NG5				
West Coast Aquatic	NGO	NG6				
Mount Arrowsmith Biosphere Region	NGO	NG1				
Nanaimo Area Land Trust	NGO	NG4				
Mid-Island Habitat Enhancement Society	NGO	NG3				

Total	18	6	3	4	5

Interview questions were informed by the literature review and align most closely with the Community Conservation Research Network (CCRN)'s analytical framework for social-ecological systems, based on Elinor Ostrom's foundational work (Berkes et al., 2014). The CCRN approach outlines *meaning*, *motivation,* and *outcomes* as important factors in determining underlying processes in the governance of social-ecological systems (Berkes et al., 2014). Within the CCRN framework, the range of relevant decision-making processes are considered in the social-ecological system lens including issues of power and politics, as well as Indigenous perspectives (Charles & Berkes, 2021, p. 10). The next component of the framework is to assess both the livelihood and biodiversity outcomes and what constitutes success in both of those realms. While those aspects were touched on in this study, the focus and scope remained on the elements of meaning, motivation, roles and relationships, with just brief a foray into outcomes. This study relied on the interviewees 'perception of watershed health rather than a quantitative assessment of ecological, hydrological, or economic data. Watershed outcomes were derived from literature review and interview responses, again limited to the qualitative approach, as a mixed methods strategy was beyond the scope of this thesis. See Appendix A for the interview protocol that was used, and see the responses summarized in the Results section.

Network mapping. As noted by Hoffman (2009), examining organizational arrangements through a network lens by creating visual maps of relationships is a tool used in a variety of fields to better understand the diverse ways that organizations interact with each other (p.42). In their examination of social network theory, Kilduff and Tsai (2003) describe the

intersection between the central concepts of population ecology and social network research ideas and methods, including legitimacy, competition, and niche, which can be examined using network ideas and methods, such as visual mapping (p. 63). By examining social processes, environmental conditions, and interactions within and among populations, one can study organizational evolution with an ecological view (Baum & Singh, 1994). Mapping a network of relationships in which an organization is embedded can reveal the extent to which a focal organization — in this case regional governments — negotiate their environment in terms of resource flows with other organizations working on watershed management and governance (Kilduff & Tsai, 2003, p.62).

Therefore, to gain greater insight into the relationships that exist among groups of organizations in my case study areas, my interviewees were asked to engage in a visualization exercise as part of the interview, to draw a network map of the organizations involved in watershed governance or management within their region, and what linkages (resource flows) exist between them in terms of the following categories: data sharing, funding, regulatory, or informal support. These categories were selected based upon general literature review, with specific adaptation of categories used by Jatel (2013) in similar research within the Okanagan Basin. This visualization exercise was not meant to be exhaustive; rather, it was intended to draw out from the interviewees what the salient organizations are and the nature of their relationships based on those high-level categories. Initially, this was performed in person with chart paper, coloured markers, and sticky notes; however, when the interviews moved to a virtual format mid-March 2020 due to COVID-19, the mind-mapping exercise was also eventually moved into the inVision app (https://www.invisionapp.com/), where the interviewer and interviewees could

view the same virtual whiteboard where the drawing took place in real time and was subsequently saved as a screenshot.

Data Analysis

The CCRN Social-Ecological System conceptual framework (Berkes et al., 2014) provided a structure for my interview questions to be codified and analyzed, and limited the number of variables for analysis to make comparisons more tractable (George & McKeown, 1985, p. 25). As described in George and McKeown (1985), a "structured, focused comparison" method is a way to perform a small number of case studies to make the "comparability of the cases more systematic and defensible" (p.41). This approach is consistent within the topic area of water governance, and natural resource governance in general, as there is much research (for example, Homsy et al., 2019; Nunan, 2018) that seeks to propose a conceptual framework for governance by scanning the existing theories and concepts in the literature and then assembling these concepts into a coherent comprehensive framework. It is then common for researchers to test a framework by applying it to a case study — or in more detailed works, multiple case studies at different geographical scales, locations, and contexts (Pahl-Wostl et al., 2012) — to illustrate its utility in practice.

Coding interview data. Grounded theory, originally articulated by Glaser and Strauss in 1967, is a formal research method for handling and interpreting qualitative data, including how meaning gets assigned by researchers to the observations expressed in their data, through a constant comparative method (Locke, 2011). This follows a general process of naming, comparing, and memoing (coding) to get familiar with the data; composing and integrating the

data into a set of categories; organizing and bounding the categories to form a conceptual whole; and then writing the theory or analytical narrative (Locke, 2011).

My coding was initially structured by the CCRN SES analysis guidelines and then further by emergent subcategories within and adjacent to those thematic areas that I identified in becoming familiar with the data and beginning to seek the recurrence of themes across interviews. The key variables of meaning, motivation, roles, relationships and outcomes were analyzed, seeking patterns and validation against literature and personal experience. Following my preliminary manual review and identification of codes based on recurring motifs in the interview responses, analysis of the data was done with the assistance of a coding software, NVIVO, to further elucidate patterns and organize content into emergent themes. Recordings of the interviews were obtained with consent of the participants and then transcribed into a Word document format with the assistance of a transcription software Otter.ai. These transcripts were then uploaded into NVIVO and coded first with an open coding method, to develop some initial interpretations and become familiar with the data. This was an intuitive process, relying on my induction and reflection as a researcher to organize it into meaningful categories (Mills et al., 2010-a). The open coding process then moved into axial coding (Mills et al., 2010-a) which involved relating concepts between categories, linking concepts together, and finding where there was divergence. NVIVO was also used to organize and code literature and documents for key themes.

Aggregating network map data. In order to qualitatively analyze the data obtained via the mind-mapping portion of the interview, this information was aggregated manually into KUMU (https://kumu.io/), a network mapping software (as used in Newell, Dale & Roseland,

2018). Aggregated maps were created for each of the case study regions. This was done by including all the organizations that were named by respondents, and making linkages between organizations as depicted in the individual maps. Each organization was assigned a coloured label or 'tag 'based on whether it had been identified as connecting to others by funding, regulatory, informal, or data-sharing relationships. This coloured tagging illustrates how different categories of benefits are perceived to be flowing between organizations within a watershed, and where there is apparent power, inclusion, collaboration or disconnect. Each region's aggregated network map provides some insight into the nature of organizational arrangements in those case study areas and provides an opportunity to observe similarities and differences, but is not purported to be objective reality, as it represents a composite snapshot of the mental models shared by the interview participants. This composite snapshot is inherently flawed and incomplete, but still provides valuable information on perception.

Triangulation of data across these three steps — literature review, interviews, and visualization — provides some relative reliability of the findings and interpretation. This process results in a descriptive analysis that considers which elements of watershed governance revealed in the research may be replicable or scalable in different social-ecological contexts and which elements are hyper-place-based and tied to the local context. Ultimately, the methods used help to summarize current and possible place-sensitive organizational arrangements for sustainable watershed governance and integrated watershed management in the case study areas.

Limitations

The following represent some of the limitations of this study. For manageable scope it did not compare all regions on Vancouver Island so only speaks to the results of these three contexts,

which likely misses some important place-based traits in other Vancouver Island regions that are not considered in this analysis. Also, within each case study region, every organization that is engaged in watershed governance and management could not reasonably be represented in interviews and not all departments of larger organizations are necessarily represented by the individuals that did participate.

The scope focused on the social aspects of the social-ecological systems and did not allow for collection of primary ecological data nor perform quantitative analysis of existing ecological data. This would be an exciting next step to extend the findings of this research to compare organizational arrangements with ecological outcomes more directly.

While I worked to manage for bias by stating my positionality upfront and using a structured set of variables grounded in the literature for analysis, my subjectivity as a researcher is by no means removed from this research. The experience and lens that I brought to the study were valuable tools for performing nuanced analysis, and gave me the capacity to identify patterns and comments of importance, which may otherwise be unregistered by a researcher who is more removed from the content and context. There are also no claims that this research reaches any quantitative or statistically significant conclusions; rather, it dives deeper into the nature of organizational relationships in a qualitative manner to unearth insights that may provide principles useful to intentional efforts for improved collaborative watershed governance in the Vancouver Island and BC context, and potentially beyond.

Results

The results of my primary data collection are presented in this section, organized by the thematic categories of interview questions I asked — meaning, motivation, roles, relationships, and outcomes — following the Community Conservation Research Network (CCRN) analytical framework for social-ecological systems. Probing into the various organizational perspectives on these variables helps to reveal what types of arrangements between and within organizations could support sustainable watershed decision-making in the Vancouver Island context, and in particular, what niche(s) regional governments could fill for watershed governance within different social-ecological contexts.

Meaning

The CCRN analytical framework (Berkes et al., 2014) identifies *meaning* as an important variable in understanding conservation and stewardship actions. In my research, I was curious how "effective watershed governance" and "collaboration" in particular were understood by the various organizations and whether it varied across social-ecological systems. Probing these perceptions is necessary to inform conservation policies, approaches, and practices (Sowman et al., 2021, p. 19). What also emerged, though was not asked about directly, were the multiple nuanced meanings of 'watershed 'relayed by the interviewees. Many talked about a watershed as filled with resources for managing. Some spoke of the inherent interconnectedness of a watershed. Most viewed it as the entire land base, but others seemed to view the concept of a watershed more narrowly as the upper elevations or drinking watershed. The only Indigenous interviewee that participated in this study uniquely described a watershed as a living being, interconnected and rich with spiritual significance (FN1). Both provincial and regional

government staff described the watershed as an appropriate land use planning unit or natural resource management unit.

Effective watershed governance. Prior to asking interviewees what effective watershed governance means to them, I shared with them a definition of watershed governance adapted from Plummer et al. (2011): "The range of political, social, economic and administrative systems that are in place to make decisions concerning land and water management on the basis of watershed boundaries". From there, respondents expanded upon how they understand *effective* watershed governance, based on their experience working in that space. A common theme was respect — most often expressed as respect for multiple values, and balancing perspectives in deciding what happens on the land and with the water. That included a range of ecological, economic, social, and cultural values. It was also respect in a scientific sense of respecting watershed functions, ecological boundaries, and natural law. Again, unique to the Indigenous organization respondent, it was described as a respectful relationship with the land and water through reciprocity and spiritual connection. Participation and involvement of the community was emphasized, as well as transparency of process. Accountability, authority, and having "teeth" was also occasionally mentioned (G9), although not by most. Outcomes were also referred to when defining what would constitute effective watershed governance. This included reconciling conflict, meeting community needs, addressing ecological issues, and generally achieving a "healthy" watershed for all living things.

There was some divergence in how the meaning of effective watershed governance was conceived of by the various organizational representatives, but it was mostly based on the nature of their organization or position rather than divergent based on case study area (social-ecological

system). For example, the environmental NGO respondents most often described it in terms of holistic approaches that extended beyond the anthropocentric view and included biological needs such as habitat (NG2) and recognized Indigenous spirituality and culture (NG5), or at the very least involved First Nations' perspective (NG4). The regional government perspective on effective watershed governance was focused on the local community in terms of public concerns being considered, buy-in from the people who would be affected, recognizing impacts to livelihoods, and working together across jurisdictions (G6, G8, G3). Provincial government interviewee responses touched on working together with all stakeholders or "involved parties" and progression towards common goals (G5, G7). The most all-encompassing description of what effective watershed governance means was articulated by one of the non-governmental groups in the Alberni-Clayoquot region:

> Effective watershed governance for me, one, is that it needs to be looking holistically, multiple species, multiple jurisdictions, not looking at those in isolation, and also connecting beyond the watershed's boundary into the impacts between watersheds. Effective governance also means having diverse and inclusive voices at the table, those again who are closest to the resource and by extension, that means multiple knowledge systems and sources: indigenous, local, and scientific. And then, you know, probably one of the other main categories for sort of effective governance is around recognition and respect of indigenous rights and how that translates. And recognition and respect includes full adherence to court decisions around things like consultation and beyond consultation, implementation of UNDRIP, reconciliation principles etc. (NG6).

Collaboration. To further investigate meaning and how interpretations vary across organizations, interviewees were asked about collaboration. In the literature on watershed governance, collaboration is a paramount tenet for achieving collective action and embracing the complexities of competing watershed demands and divergent interests (Heikkila, 2017; Teisman & Edelenbos, 2011; Plummer et al., 2011) to support land and water management in the face of uncertainty. It is seen as a foundational governance ingredient to include institutional arrangements that foster "processes of multi-level collaboration" (Charles & Berkes, 2021, Chapter 10, p. 57). So, in the case study areas of interest, do concepts of collaboration align or differ between organizations?

Many agreed: collaboration is active engagement of multiple parties where people are working together to find a place of convergence and understanding to fulfil mutual values, rather than passively accepting information or forcibly imposing decisions. It was mentioned in various ways that collaboration requires a forum, facilitation, dialogue, practice and ongoing commitment or "choosing" to come together. It can be formalized in Memoranda or Agreements or Government-to-Government relationships. Or, it can be informal discussions, meetings, and actions that serve to share resources and build mutual benefit. All respondents shared the sentiment that you're able to achieve more working together than working alone. One NGO representative took that further to say that collaboration is "ultimately trying to build an outcome that's generative. One plus one equals four or five. That's the ideal anyway" (NG6).

Predominantly, interviewees' views of collaboration were focused on collaboration between people and organizations, not collaboration with the land and water itself. The

Indigenous organization representative was the only interviewee that directly described

collaboration as not just between humans, but between beings more broadly (FN1).

Collaboration from their perspective is a fundamental, cultural, and natural law — collaboration

is essential to survival. Through that lens, collaboration is enacted through practice and protocol.

How do you treat salmon, how do you harvest them? Do you show respect and recognition of the

spiritual and physical nature of trees? Do you offer gratitude or anything in return?

Motivation

The CCRN guidelines (Berkes et al., 2014) also identified *motivations* as a key variable

to consider when analyzing social-ecological systems in terms of effective community

conservation activities (p.8). Making these explicit can reveal internal and external factors that

are driving organizational behaviours and arrangements. I asked my interviewees what they

thought compelled or motivated their organization to engage in watershed management or

governance. The responses are structured by organization type, below.

Senior government. As a Federal government agency, the Department of Fisheries and

Oceans (DFO) has a narrow motivation: to manage fish and fish habitat in order to provide

opportunities for people to fish and feed themselves and their communities, and to sustain

economic fisheries in the marine context. Respondents from DFO noted that the motivation is

simultaneously to protect ecological and economic values, and the balance of the two is

influenced by the political climate of the day. The organization's motivation is articulated as a

legal responsibility that has, more recently with the new *Fisheries Act*, shifted to focus on the

protection of the whole ecosystem that supports marine fisheries, including freshwater

watersheds that connect to the ocean, particularly as spawning and rearing habitat for focal species like Pacific Salmon.

Several provincial ministries have a hand in activities related to watershed management and governance, the two primary ones being Ministry of Forests Lands Natural Resource Operations and Rural Development (FLNR) and Ministry of Environment and Climate Change Strategy (ENV). From the lens of the Water Authorizations Branch in FLNR, their organization's motivation stems from the fact that water is a precursor for life and essential for the economy. In their words, custodianship (a term used instead of ownership) of freshwater is vested with the Province, to ensure water allocation decisions benefit the economy and the public good, which includes environmental protection and reconciliation with First Nations. Their objective is to implement sustainable resource management and manage conflict over water at the provincial scale, and ENV's Water Policy Branch develops the policies accordingly. While managing land and water is described as a constitutional responsibility, the respondents also relayed their ethical obligation as public servants is another key motivator which drives collaboration, in recognition that a holistic and inclusive approach makes their work easier to do well for the people of the Province (G5, G7). From a policy perspective, ENV staff also noted that a key motivator under their current administration is reconciliation with First Nations and responding to interest for more local involvement (G1).

Regional government. For the three regional governments in the case study areas, their motivations centre around the obligation to provide services that directly affect the quality of day-to-day life in their communities. This includes provision of drinking water, development permitting and land use regulations, emergency management and public safety (referenced in

terms of flooding) (G3) and more. They are compelled by their governmental responsibilities in terms of jurisdictional authority, but also directly by ethical duty to the community. A key driver for CRD in particular is to facilitate across municipalities to ensure that science-based decisions for the best long-term future of the community are made (G6). The RDN response extended this motivation further to influencing senior government in decisions that affect the region's water sustainability by providing local data and place-based science (G9). Respondents also expressed that watersheds are a "perfect management unit" and while not always explicitly noted as an organizational motivator, "it's implied in a lot of our service delivery, and then in certain work plans […] we're trying to make it more explicit by identifying the watersheds and identifying the stressors that are impacting those watersheds, and providing best management practices or other information for local governments to manage those natural systems" (G6). Another motivator, generated by community demand, is to preserve natural areas for public benefit including recreational activities, economic opportunities, and inherent environmental values, aligned with the service of Regional parks (G8).

NGOs. In each region there are a number of environmental NGOs focused on watershed management and governance issues. They range from having a research focus (Clayoquot Biosphere Trust; Mount Arrowsmith Biosphere Region), to having a stewardship focus (Mid-Vancouver Island Habitat Enhancement Society; Central Westcoast Forest Society; Peninsula Stream Society), to having a convening and facilitative role (West Coast Aquatic; Nanaimo and Area Land Trust). What is similar across all the various groups is their motivation for restoring or protecting biodiversity, connecting their community to a sense of place, and engaging in some form of data collection or community science. All are motivated by the prospect of being a voice

for ecological values in the community and taking action to foster the health of their local watersheds.

First Nations organization. As I only spoke with one Indigenous organization representative, the diversity of motivations within the case study area First Nations are not presented here. Still, to summarize the response that was provided, a key motivation from the Indigenous perspective that was shared is the hereditary responsibility for stewardship and spiritual connection to the land and water. This is amplified by the modern urgency to remedy the damage inflicted by colonial resource management (FN1). The objective is to have more of a say in decisions about the watersheds in their ancestral territories, to ensure operating principles are rooted in indigenous culture. Ultimately, they articulated that the goal is to have Indigenous rights recognized and honoured, to give Indigenous communities a renewed connection to the watersheds, and be able to care for them as a key cultural role and responsibility. In particular, the preservation of biodiversity and conservation of wild salmon stocks is crucially tied to the cultural, social, mental, emotional and economic well-being of the Indigenous communities (FN1). Interestingly, the linear language of 'goals and objectives' was not present in the responses of this interviewee. Rather, intention, practice, principles, connection, and recognition were words used in this context instead.

Industry. From the perspective that was shared from the lens of agricultural producers in the ACRD, there is a strong motivation to engage in watershed management and governance linked to the critical need for access to water supply for farming. Farmers also recognize the importance of healthy water for the community they live in as well as for their crops. Their

objectives really come down to ensuring quantity, quality, and affordability of water for their production and community (IA2).

The motivation of the forest industry is oriented around social license to operate and obtain economic benefit from their lands. They are strongly compelled by their ownership over the forest lands they operate on and feel their private property rights entitle them to full freedom over practices, yet they are simultaneously motivated to be good neighbours and ensure their practices are science-based and not having material impacts (IF1). Their articulated watershed goals and objectives vary depending on the watershed: "…if it's a drinking water source, then ensuring that we extract our timber in a way that ensures the City has a safe and sustainable supply of water is primary [such as China Creek in the Alberni-Clayoquot region or Nanaimo River in the Nanaimo region]. If it is not a community drinking watershed, then it is more generally the objective to not materially impact wildlife or fish habitat, water quality, a more generic suite of objectives." (IF1).

Roles

Simply put, an organization's role is essentially what others are relying on them to deliver. This role can be bestowed through legal jurisdiction or be self-appointed in seeing a gap that needs filling in terms of watershed governance at the community level. I asked my interviewees, as a way to probe into their role in the watershed governance space, about the responsibility, power, or control that their organization has. I also asked them to comment on the roles of other organizations, to try and get a multi-level view of the watershed governance ecosystem in the various case study regions.

Responsibility and Power. The Indigenous organization representative I spoke to described that hereditary chiefs have Creator-given responsibility for the health of the lands and waters, but currently they are stripped of power and control due to the lack of recognition by the federal and provincial governments of their hereditary authority (FN1).

From the federal government perspective articulated by DFO representatives, DFO has control over opening or closing fisheries, and powers when there is the potential to harm fish or fish habitat. This admittedly often ends up being reactive enforcement rather than proactive protection, leaving some staff frustrated about the level of control: "Sometimes I wish we had more" (G2). The various powers and controls are distributed throughout the agency, not consistent across branches. The respondents that I spoke to are involved with public engagement and see their responsibility as empowering the community:" the power is in the people" (G4). This is potentially unique to this branch of DFO and not representative of that organization as a whole, which also includes enforcement, policy, and research focused branches. The Province is described by DFO respondents as having the most regulatory control in terms of freshwater and land uses that directly affect freshwater, such as forestry and highways, and therefore collaboration across levels of government is required. However, reportedly that collaboration is not necessarily what takes place (G4). This is corroborated by provincial staff who describe DFO's assertion of power over freshwater (for example requiring flow releases from dams) as an "ongoing legal question" and suggest that DFO doesn't't really have that jurisdiction (G5).

The Province is where the colonial vesting of power over freshwater rests, dating back to the original provincial *Water Act* of 1909, which was recently updated in 2016 and is now called the *Water Sustainability Act.* Those who work for the Province recognize their organization's

power. It has legal powers over allocation of water use, inclusive of groundwater and surface water licensing. It has the power to require that water users curtail use in times of scarcity. The Province can also set water objectives that industry must abide by, and a whole suite of other policies related to water and land, including discharge permitting for pollution management, species at risk policy, park management, freshwater fishing licenses, source water approvals, etc. Control and powers are described as distributed across ministries and branches. While Provincial Acts give them power, the Province can delegate powers as well (G1, G7).

Regional government respondents describe their organization's control resting with land use, zoning, and development, with the exception of crown lands or private forest lands. The ACRD respondent mentions that it has the opportunity to provide input on crown forest lands, but not on private lands. Elected Regional Boards have the power to set priorities for public services, funding allocation, and committee structures. The CRD respondents do not see their organization as having any watershed specific powers in the urban context — it is the municipalities that have land use controls and CRD is just supporting (G6). But in the rural Electoral Areas, the regional government is the land use authority. One description provided is that regional government has "as much control as there is interest and support from the community" (G8). Respondents from regional government see their responsibility to take action and protect watersheds as integrated with all the other services they provide to the community at the regional level.

The agricultural industry representative that participated in this study feels that producers and local government have very little power in terms of watershed governance and that most of it rests with private forestry and the Province. In light of that, it was further described as "our

responsibility to empower ourselves", as is being done by way of a new multi-agency council that is being formed to advocate for agricultural water at the regional level in the Alberni-Clayoquot case study area (IA2).

From the private managed forestry respondent's perspective, where they own land, they have high levels of responsibility legally by way of private property rights. Sometimes responsibilities are shared when there are multiple land owners of tenures in the (upper) watershed. They describe it as "fairly complete power" on their private lands, including being exempt from municipal or regional bylaws (IF1). Additionally, they acknowledge the interesting layer of First Nations rights and title that is developing in the courts and may cause some changes in the future, but for now the legislation still protects them as private landowners. The company tries to work with each Nation that has traditional territory where it owns the land, to offer "as much access as we can provide while also being a private landowner" (IF1). To put it another way, the company does not cede any control or power but recognizes that there are some obligations to First Nations on their traditional territory. The organizational representative that participated in this study was very cognizant of the public sentiment that forest lands should not be owned or controlled by private landowners, and noted that this grievance was largely from an access perspective (IF1), although other interviewees commented on this from an environmental protection perspective as well (G3, NG4).

In the NGO sector, the common response was that while their organization has zero jurisdictional authority or control, they have some measure of influence in being part of the conversation with the community. Some organizations felt positioned to bring voices to the powers (government) through a respectful process, even though they do not have direct powers

themselves (NG4). One group expressed that they feel there is no forum where they can "sit down and interact with the main powers, and responsible agents of watershed governance", whom they describe later as the senior government entities, water license operators and landowners (NG3). More accurately, forums such as roundtables and committees do exist in their region, but this particular organization does not participate in those forums and so does not associate them with influence. More readily than power or control, the interviewees from NGOs related to the responsibility aspect, feeling "deeply responsible for this region" (NG1) and "responsible for biodiversity conservation and being conveners and collaborators" (NG5). The respondent from the organization that is most involved in watershed restoration projects on the west coast described that they are involved in the conversation and some parts of the decision-making process but only in a very small capacity (NG2). Interestingly, the organization that is involved with facilitating watershed roundtables in that region sees itself in terms of leading without authority; that it has no formal powers, only soft authority which is entrusted to it by people in the system to use within these processes (NG6).

Influence. Interviewees had the opportunity to comment on what influence they have on activities that are outside of their organization's realm of control. This had already come up for most NGO respondents in the prior question on power, control, and responsibility: without formal powers, those groups are better characterized by their ability to influence, rather than to exert control.

The Indigenous organization respondent expressed that the senior government agencies do not seem to be significantly influenced by the information presented by rights holders and stakeholders (FN1). They go on to say that one way to influence the perceived lawful regulatory

bodies is for the Indigenous hereditary chiefs to assert their authority and "just go and govern. And that means putting bodies on the water. That means notifying DFO that no one will be fishing these watersheds this year. And so, we lead the practice at that stage, and sometimes the practice is respected, or at least acknowledged. And it's recognized by these other governing authorities. But we have to put that into play. And we technically risk a lot by doing so because it's not technically legal, but it is technically legal at the same time" (FN1).

From the perspective of DFO interviewees, roundtables are a key forum for influence with different levels of government including First Nations. Roundtables are seen as networks of information sharing and an opportunity to provide expertise. In the Alberni-Clayoquot region these have been established with a salmon focus, whereas in the Nanaimo region the roundtable for the Nanaimo River focuses more widely on the watershed as whole. The DFO respondents describe that through their community liaison efforts supporting people in gathering data, doing stewardship or watershed restoration or enhancement, this in turn helps their organization in dealing with other jurisdictions and is a form of indirect influence (G4).

The provincial respondents pointed to Water Sustainability Plans, a new tool under the *Water Sustainability Act*, as the only formal mechanism that exists to bring together the planning and management of water and land (G5) by reaching into other areas of legislation to set conditions that would protect ecological values of freshwater (G1) in an area-based context. A Water Sustainability Plan and any regulations or objectives developed under it would be a means to try to influence industry or local government in terms of land use practices in a watershed-focused way. The respondents also concede that influence is less relevant to the Province as it has a lot of power with regard to land and water management and governance. With that said,

they describe that their organization is receptive to influence that can occur through partnerships

with other organizations to "make sure that our work is complementary" (G7). There is

recognition that the Province can't do it all and "in some cases, watershed groups and local

governments are producing really good quality data that can be very easily taken up into our own

decision-making processes" (G7).

        Regional government representatives speak readily to influencing senior government

through political pressure, advocacy, and input through referral processes or public consultation

(G3, G9). The RDN respondent, for example, describes how they provide local data, knowledge

and science to inform senior government decisions that affect the region's water and watersheds,

such as water licensing and rural subdivision approvals. The Province reportedly receives this

well, as the RDN and community partners have collected the information based on provincial

protocols and with their guidance. Respondents from local NGOs in the Nanaimo region share

that the RDN has done a "really great job growing a community of stewardship around water"

(NG4, NG3), influencing engagement at the local level. Regional government representatives

also speak to how their level of influence has been developed through informal working

relationships and conversations with senior government, industry, and First Nations, and that in

some ways this can be more effective than formal processes (G3, G9). The RDN convenes a

technical advisory committee for its Drinking Water and Watershed Protection program, which

provides a multi-stakeholder forum for information sharing and more informal influence.

Currently the RDN respondent feels it has limited influence over rainwater management but is

working towards expanding its involvement in this aspect of land and water management (G9).

CRD in particular speaks to influencing municipalities by providing information, data, research

or best practices to support them in their decision-making. It sees its leverage in pooling

resources and developing partnerships or networks to try to influence a collaborative outcome

(G8). On the other hand, it was shared that: "the challenge with the CRD is that we sort of have a

limited scope of influence. We're not like the provincial government or even like a local

government, where they take general revenues and they can sort of develop governance and

apply their resources how they need to. The CRD is a regional government, our regional

government in BC, get delegated certain services…we're delegated whatever the municipalities

want to give us responsibility to manage where it's more efficient on a regional scale versus a

sort of a local government scale" (G6). In other words, the respondent's perspective is that

influence originates with the municipalities enabling regional government to provide services on

their behalf, yet with the regional government consolidating the interests of both the rural and the

urban communities in their geographic area, advocacy to the province can be stronger than just

one municipality's voice, and services can be efficiently delivered at the regional scale. The

ACRD is trying to consolidate its influence on senior government in terms of agricultural water,

by establishing a regional level roundtable (also described earlier as a council) to create a shared

voice to advocate to the Province and work together across agencies with producers in the

region, with the organizing focus being water for farming (IA2).

Though drinking water infrastructure is outside of private forestry's direct area of control,

the interviewee from the forestry organization notes that they would have a measure of influence

or input on any process to raise dams if it would affect their land (IF1). More broadly, they

comment on the influence their organization's practices have on wildlife habitat and populations

and explained that "it's not a one-to-one relationship; there are other forces such as climate

change, predation, overwintering conditions" that factor in (IF1). From the private forestry representative's perspective, with regards to other organizations, Treaty First Nations with settled land claims have a lot of influence on treaty land and on crown license land that they hold, within the Alberni Clayoquot region in particular. In the Nanaimo region, the Snuneymuxw First Nation is seen to have lots of influence in the Nanaimo estuary but not necessarily in the entire watershed (IF1).

The NGOs that focus on research articulate that they engage in research in order to influence policy around watershed health and more broadly the human–nature connection (NG1). This includes the groups involved with local data collection, trying to use that information to influence activities in the watersheds. All of the NGOs that participated in this study see their influence in engaging the community and using education to "reach beyond what they can control directly" (NG2). Most feel that they do not have a strong influence on the forestry industry and end up focusing more on what residents can do in their own backyards, or rallying the community around shoreline or streamside cleanups (NG2, NG3). One group sees their influence as being able to act as a conduit for community concerns around loss of natural areas: "we can build a structure around those concerns and bring them to elected officials and staff and show that there is a lot of community support for these issues" (NG4). They go on to describe that they try to pair the issues with proposed solutions in terms of land securement and watercourse restoration projects, and sometimes these are partially funded solutions due to the NGO's ability to obtain grants or fundraise. This financial influence is even greater for NGOs that have an endowment and are financially stable, and have a mandate to invest sizable grants annually into the community, for projects that align with sustainable development, as is the case

with the Clayoquot Biosphere Trust. The influence they have is essentially as impact investors, "influencing the direction in which non-government organizations, especially if they're aligned with education or research or conservation, go. The influence is indirect yet broad and multi-scale" (NG5). As for the organization focused on facilitation of watershed planning processes, they see their influence not over the decisions themselves, but on how the decision is made: more collaboratively, inclusive of community input, and brought closer to the source (NG6). They describe how they are influencing DFO to open up the "black box of decision-making" in terms of transparency about what is done with the stakeholder input.

Expanding organizational control. Interviewees were asked what their organizations would like to have control over, but don't currently, if anything and why. Several respondents across sectors pushed back against the use of the word *control*, including the Indigenous organization, regional government, and NGO representatives. Interestingly, those who are not currently in positions of control, often do not describe obtaining more jurisdictional control as their aim. Rather, influence and 'say 'in collaborative processes appears to be more palatable to them. This hinges on meaningful inclusion of their organization's input, translating into outcomes on the ground such as into land use planning processes. Regional government respondents as well as NGO respondents speak to wanting more public process around private forestry activities (G3, NG3, NG4). West Coast Aquatic, which has a very unique organizational structure with three 'arms' — the Management Association, focused on facilitating roundtables; the Governance Board, focused on policy and planning; and their recently folded Stewardship arm, which focused on community education and watershed restoration — describes the Governance Board as seeking delegated authority of the aquatic resources on the west coast of

Vancouver Island to enact a true co-governance arrangement with First Nations and senior government (NG6). Again, this is not described as unilateral control but more of a heightened distribution of authority to the local level.

Interestingly, respondents from DFO, an entity seen by the community as having control, expressed a desire to actually have more control, to extend their powers to managing impacts on the land: they feel their control is limited to the water, and primarily the marine aspects. Yet, the marine aquatic environment and the fisheries that they are designated to regulate impacts upon are affected by what happens on the land and with the freshwater. So, this division of control — DFO over marine, Province over freshwater — leaves the Federal agency representatives expressing a desire for more opportunities for participation in the land-based decision-making that will affect fish downstream (G2, G4).

The CRD respondent seemed content with their organization's current level of control, saying that "the regional government's not looking to expand or contract any of the powers or resources it has" (G6), while the RDN respondent expressed a sense that their organization would like more control over how land use proceeds in the rural areas, and to have the ability to adjust long-range planning documents more frequently with less process (G9). All regional government interviewees favoured influence — by way of data collection, collaboration, and advocacy — as more effective, cost-efficient, and ultimately in the best interest of the local community, as total control (whether that's of water licensing or private forest practices) comes with a significant cost.

From the perspective of industry, although the agricultural sector respondent didn't like the word *control*, they commented that producers do need to have some certainty and assurance

over the water supply on their lands, so that they can ensure it is secure and clean. New groundwater licensing requirements, a provincial regulatory tool in part intended to increase water security for agricultural producers, were described by the agricultural organization representative as too convoluted, and thought that the way the regulation was rolled out actually worked against the purpose of enhancing agricultural water security (IA2). The same respondent expressed that regional government should have more control over what happens in the watersheds, and be able to support farmers in having control over water on their own lands.

Private forestry, on the other hand, recognizes that they have "a fairly high level of control so it's hard to imagine more control". One exception was how they feel a lack of control when there is legislation and policy review. "The company, I'll say, certainly feels vulnerable when legislation and policy is reviewed at a provincial level, you know. So we are a business and that kind of uncertainty introduces a risk. The Private Management Forest Land review is a good example where, you know, you operate under a piece of legislation and your business is built around that legislation. And, you know, introducing new regulations or new requirements under that legislation, especially when we don't have a view to what those might be just creates uncertainty" (IF1).

The Province also acknowledges its high degree of control in terms of water and watersheds, but one interviewee went on to describe that if they could "incorporate land use decisions in with water decisions" (G5) across ministries— like FLNR for water authorizations; Ministry of Transportation and Infrastructure (MOTI) for rural subdivision approvals, crown land resource decisions and private forestry oversight; and ENV for water quality — then that would provide an improved, more holistic approach to land and water management. This is

something that the interviewee desired, but felt was beyond their control as a staff person and that it would require a legislative change.

From the perspective of the Indigenous respondent, "control isn't a healthy word to use… in terms of exerting control over the watershed. Because that's not the intention. What we need to do is to limit or restrict or manage more carefully our activities that relate to the health and well-being of that watershed" (FN1). In other words, the watershed does not need controlling; it is the human practices that need to be more supportive in relation to the biodiversity of the watersheds, and in recognition of traditional values and principles. Control is not the aim of the Indigenous organization that participated in this study; its aim is to have a leadership role, in a collaborative context (FN1).

Well-defined / well-understood. I asked my interviewees to give me their sense if watershed governance and management roles are well-defined and well-understood in their region. Most described that it is a complex landscape in terms of regulation, involvement, ownership and legislation, and, even to professionals involved, it feels fragmented. One respondent suggested: "…maybe it's about clearly establishing management boundaries. You know, like, officially, we will manage this watershed like this, and these are all the groups and all the players and all the sub-watersheds…" (G4). This was described in the sense of formalizing the terms for collaboration on watershed decision-making in a particular basin, and that was seen to provide more clout, more buy-in across parties, and an alignment of tools and language (G4). The provincial government representatives themselves described their organization as siloed, and that decision-making is split or distributed across multiple ministries with no one ministry completely responsible for watershed management (G5, G7). They share

the sentiment that a more holistic approach is desired and would be more successful in achieving

long-term sustainability: "Working from a watershed perspective in a more organized way

maybe, I think would help us manage [land and water] better" (G7). However, the respondents

acknowledge that it is challenging to shift to a holistic approach, given the historic divisions

between ministries that persist to this day. When probed about the benefits of the internally

distributed model, the main strength was seen to be the expertise that can reside within each

ministry or sector, and that it promotes collaboration with a diversity of perspectives within

government itself. The split between federal and provincial jurisdiction when it comes to marine

and freshwater also was raised by a number of respondents in both senior governments and in the

NGO sector (G2, G7, NG6). One respondent in particular pointed out that Nuu-chah-nulth First

Nations peoples don't draw a line between freshwater and marine, and nor do many of the

stakeholders engaged in watershed management or fisheries, but the way the authority is

delineated is counter to that (NG6). The compartmentalization across organizations ends up

being a problem because of the lack of connection, communication, and collaboration between

them. As the Indigenous organization representative described: "there is a disconnect or a gap in

those regulatory agencies effectively collaborating with rights holders and stakeholders" (FN1).

Many respondents understand that watershed health depends on so many issues and therefore

management can't rest with any one group, and that includes financial resources as well as

authority. Yet, it is articulated that when all the components operate in isolation, the heath of the

land and water suffers, and the "possibility of great outcomes can be compromised in the absence

of coordination" (NG6).

One west coast NGO representative pointed out that watershed governance roles are especially not well-defined or well-understood between First Nations and everybody else, and although some Nations are really active in standing up for their rights and defining what needs to be done in certain areas, this is still an aspect that could use more clarity (NG2). Others articulate that there is clarity on definitions of who is responsible for what if you go looking for it, but it's not readily visible, not always understood, and not always what takes place on the ground (NG4, G2). Interestingly, one NGO points out that the fragmented nature of roles is "almost used against the concept of true watershed governance. It's too hard. It's too many resources. It requires too much capacity. It's just too difficult to bring all of those groups together" (NG6).

Unique. Each interviewee was asked to reflect on what they see as the most unique and valuable aspect that their organization can bring to watershed governance. Answers ranged from expertise (senior government); to community engagement and convening networks (NGOs and regional government); to developing policy (government); to being neutral third-party facilitators (NGOs); to doing on-the-ground restoration work (NGOs); to being able to establish service areas and requisition tax dollars for community functions (regional government); to bringing a cultural and spiritual connection to the land and water (Indigenous organization); to being nimble to respond to community interests (NGOs and regional government); to, in the case of the endowment trust, distributing grant funding (NGOs). The non-government groups that do not have authority often cited that very fact as enabling them to think and act differently, to push the conversation, and stretch the dialogue (NG1); whereas the regulators are more constrained in that aspect and potentially cannot get as much authentic participation without detracting from their specified roles and powers (NG6).

Focus on regional districts. To get some perspective from the various organizations on how they see regional districts, I asked the interviewees their views on what could be the most effective role for regional or local governments in watershed governance arrangements.

Regional District staff that were interviewed from each case study region reflected that continuing with their current roles of land use planning, implementing zoning bylaws and official community plans is important but could be more effective by having a heightened focus or emphasis on watershed planning over the long-range (G3, G9). This was reinforced by one NGO representative, who described the most effective role for regional government is "to connect watershed planning with zoning bylaws and land use, bring integrated watershed planning to the forefront of local government planning" (NG5), including coordinating across municipalities that share the watersheds (G6). Consistently, it was reflected that regional government plays an important role in facilitating across stakeholders, bridging the various regional players and provincial higher-level players, and setting up collaborative frameworks or tables as opportunities for learning and creating shared regional vision, essentially providing a collaborative space to discuss watershed issues without bringing the baggage of being the regulators (G6, G9, IA2). One regional government respondent mused that the Province would likely look at regional government-led collaboration for watershed governance or building a policy for collective watershed management as something positive and productive, and something that would compel provincial support and involvement (G9).

Many described this convening role as work that the provincial or federal government can't do, because they're "not actually connected to the people, to the watersheds" (G2) and that the regional level of government operates at the appropriate geographic scale for watershed

governance, as opposed to provincial or municipal (IF1, NG1). As put by one respondent: "the province is looking at the provincial level and regulating everybody all together, but the regions are so distinct and it needs to be seen at that level." (IA2).

An NGO respondent described the advantage of a regional government convening watershed planning as: "they care about outcomes, but not being the main regulatory authority puts them in a bit more of a neutral space" (NG6). One regional government interviewee described this as "we provide a space to talk about it without the threat of making rules about it" (G9). This was echoed by other interviewees from industry and NGOs alike, speaking to this balance the regional government strikes between having some regulatory authority but not being the direct controller of land and water in all areas, and that, combined with local knowledge and connection to community, gives them the "right vista" to be a convener of interests aligning with watersheds (IF1, NG1, NG6). Several mentioned "capacity" being a key factor as to whether regional governments can play that leadership role as a central group that brings people together. In circumstances where resources were lacking, they could have a supporting role if they didn't have the capacity to be the lead (G2, NG6). Respondents agreed that each region has unique capabilities and needs; it's not a one- size-fits-all in terms of the roles that local government should play (G1, G7, NG6). Further, it was observed that if there are other organizations or collectives already filling the space of being the convener of watershed issues across agencies, it could affect whether regional governments decided to inhabit that role or not (NG6).

Beyond convening, it was pointed out by interviewees that regional government is well-positioned to play a role in education, in terms of being an information-sharing conduit to the community and even working with the school districts. Coordinating networks for stewardship

and citizen science was identified as a key role, that is working particularly well in the Nanaimo region (NG3, NG4, G9).

Advocating at the provincial level for change on watershed management, specifically on private forest lands, came up from one Regional District interviewee (G3), and another framed it more as providing input to provincial decision-makers based on local data to inform watershed management (G9). This was corroborated by the provincial staff view that regional government has a role to "make provincial government aware of the issues they're dealing with, being advisors back to the senior levels" (G7).

It was also stressed by a Regional District respondent that "we can't be everything, we only have a limited mandate" (G6). The ACRD interviewee suggested that if money wasn't an issue "we would probably look at purchasing land in our drinking watersheds. Like CRD. Then you could have total control (G3)." The provincial interviewees were also savvy to the increased role of CRD in owning the land in their regional drinking watersheds: "For those that own their own watersheds I think there's definitely a greater role to be played in kind of planning actually as a land manager, whereas I think it's a more difficult role for other local governments to play, and regional government, when they don't own that land" (G7).

In the Indigenous organization representative's view, the most effective role for regional government is to support planning efforts led by Indigenous communities within their region (FN1). One NGO respondent, as well as a provincial representative, mused along the same lines, suggesting that maybe there is a role for regional government to be a partner for First Nations to build their capacity and even fund their participation in watershed governance (NG1, G1).
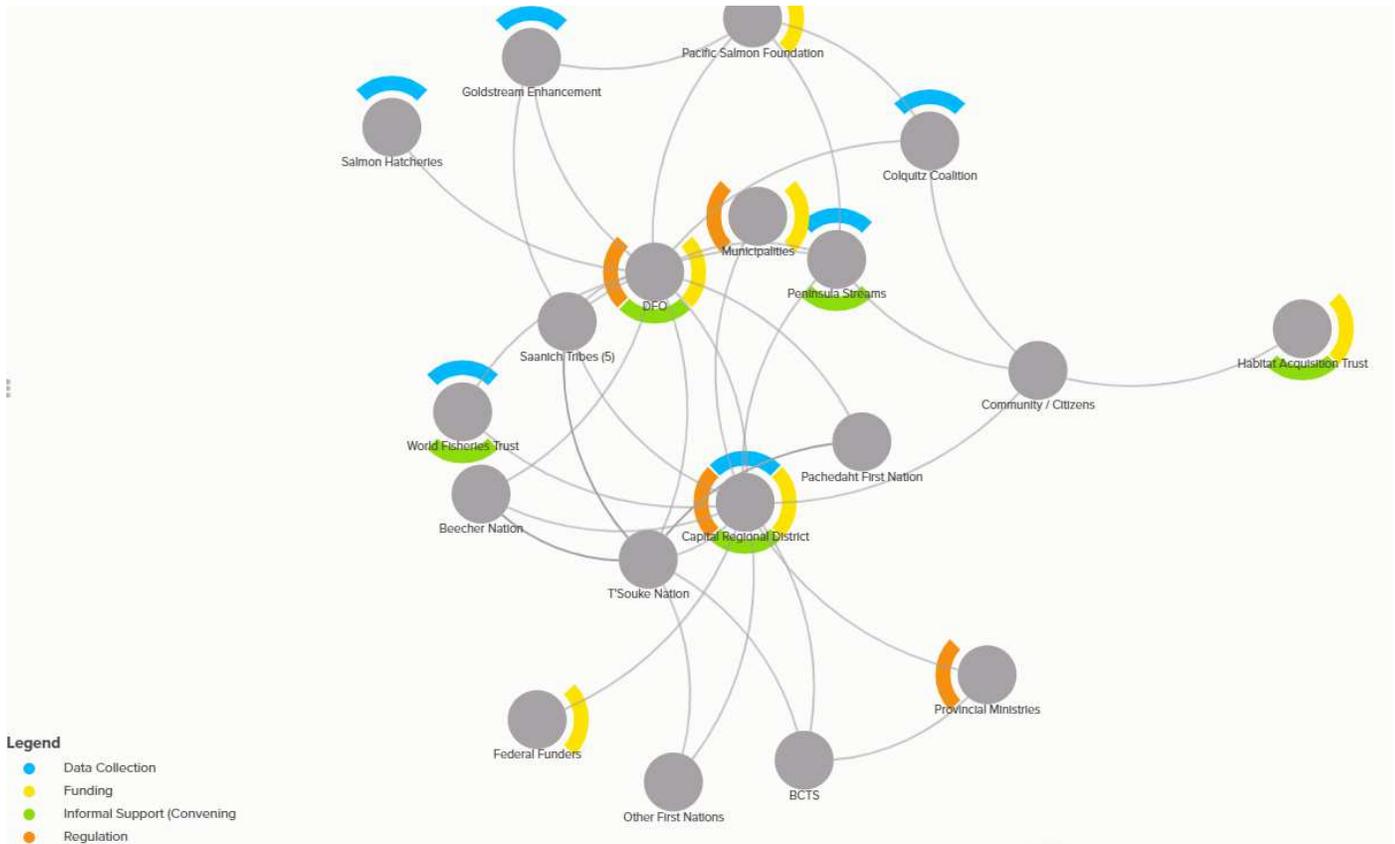
Relationships

Investigating organizational arrangements involves understanding relationships between groups. To look at the interrelationships of particular interest to regional government, my research looked at the organizational field in which they are embedded (Kilduff & Tsai, 2003).

In order to see what relationships were salient in the minds of the interviewees in terms of who is engaged in watershed governance or management in their region, respondents were asked to list organizations they knew of in this space and then visualize the linkages between them based on the predetermined categories of regulation, data sharing, funding, and informal support (such as convening or facilitating).

 The provincial respondents were not able to draw network maps at the case study level, as they work at a broader level, and so their maps reflected higher categorical groupings of organizations and their relationships in a general sense, rather than specific organizations in the case study areas and their nuanced relationships. For this reason, these maps were not used in the aggregated versions for each region. The Capital Region case study had two respondents' network maps factor into the aggregated version as one respondent did not do the mapping exercise due to time constraints. The Nanaimo Region case study had five respondents' network maps that were included in the aggregated version, and the Alberni-Clayoquot Region had seven. The relationships were not validated by literature review, as often these are not formally captured relationships and therefore the maps represent the aggregated perception of the respondents. See Figures 2–4 below for the aggregated network maps, for the Capital region, Nanaimo region, and Alberni-Clayoquot region, respectively. Visit the hyperlinks in the captions to view the maps within the KUMU web interface for added user interaction.
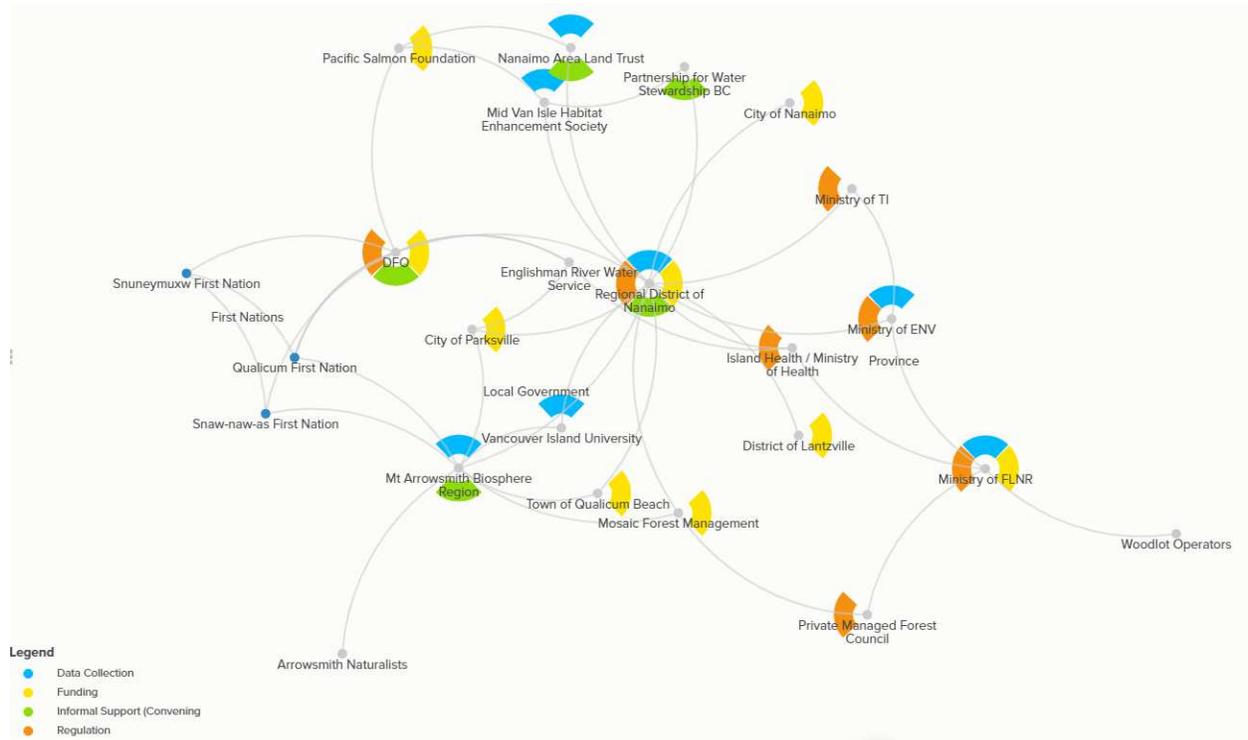
Figure 2

Capital Region Aggregated Network Map

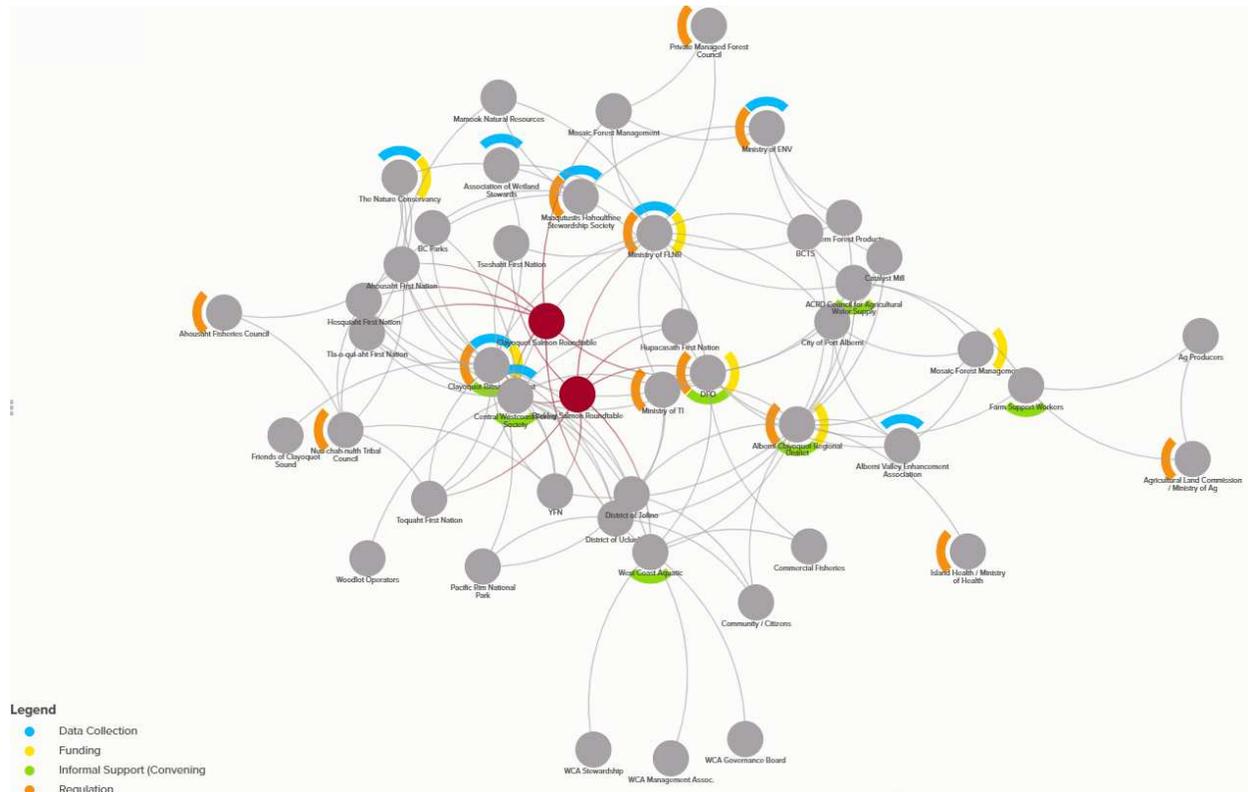*Note.* Visit the following link to view dynamic interactive version: https://embed.kumu.io/1925123da331ded43d4aaf363a18b811

Figure 3

Nanaimo Region Aggregated Network Map

Note. Visit the following link to view dynamic interactive version: https://embed.kumu.io/332ee5f91176d95b814e2e100c82f354

Figure 4

Alberni-Clayoquot Region Aggregated Network Map

Note. Visit the following link to view dynamic interactive version: https://embed.kumu.io/f1a69f72513b47ea5fabcbd1e54ce87a

Data sharing. Across the case study areas, it appears that most NGOs were connected to other groups in terms of data collection and data sharing. Regional governments, in the case of CRD and RDN, also engage in data collection and sharing. In actuality, provincial ministries collect data relevant to watershed management — in particular FLNR (groundwater), ENV (surface water) and Island Health (water quality) — however, the data-sharing aspect seemed diminished in the minds of the interviewees, and as such, flows of data between Ministries and other organizations was not often depicted on their network maps. This may point to gaps in

communication between the Province and the local communities and the need for more research on whether provincial data-sharing translates to perceived benefit for stewardship organizations.

Regulatory. In all regions, there was an overall lack of clarity on the regulatory relationships of First Nations to other organizations; some maps depicted regulatory flows and others didn't. Consistently it was illustrated that regulatory relationships to other groups primarily stemmed from senior government: Provincial Ministries and DFO. Interestingly, there was not a lot of perceived connection *between* those regulatory agencies; their regulation just flowed out to the other organizations. The regional and local government regulatory relationships weren't often drawn as linkages to organizations, more often depicted as a relationship to citizens or developers, which were drawn as categorical entities on some maps.

Informal support. This was a key relationship that some NGOs had with other organizations, while some NGOs were more isolated. For the NGOs that had many linkages in terms of informal support, often it was described as convening a network of other community organizations, loaning monitoring equipment, or facilitating dialogue. Each regional government was seen as having many relationships of this nature as well, for example convening committees or community stewardship networks. The Alberni-Clayoquot case study area had the most linkages of informal support between organizations, all stemming from Clayoquot Biosphere Trust, Central Westcoast Forest Society, West Coast Aquatic, DFO, and ACRD.

Funding. Funding relationships seemed to be dispersed across organizations; yet bear in mind these are observations about connectivity, not dollar amount. DFO funding, sometimes via Pacific Salmon Foundation, appears on all maps. Regional and local government appeared on all maps as funders, sometimes described as small grants-in-aid, other times as long-term funding

sources for programming or land acquisition. For example, the CRD currently has a parcel tax of $20 specifically to fund land acquisition for regional parks (which follows a strategy that uses watershed-based criteria to prioritize properties) (G8), and the RDN currently has a parcel tax of $12 to fund regional watershed education, science and planning initiatives. The Clayoquot Biosphere Trust was the most connected NGO across all case study areas in terms of their funding relationships, which is a function of their endowment and mandate to provide granting for local biodiversity, environmental, and community health related projects. The Province is rarely perceived as providing funding to other organizations, which reflects that they do not provide consistent or widely distributed funding resources to other groups working on watershed management or governance in these case study areas.

　　　　Case study observations.　Unique to the Capital region, the respondents did not identify particular Ministries; rather, they grouped the Province as one organizational entity. This suggests that they do not directly work with provincial staff from any one ministry, but they are aware of the general relationships that the Province has in terms of watershed governance. Perhaps it is because the Province is less involved in the urbanized areas and that the regional drinking watershed is owned by the CRD and is not crown land or private managed forest land. Along the same lines, respondents grouped municipalities into one entity in their network maps, suggesting that individual municipalities are less involved in watershed-scale initiatives and instead are connected as a function of being part of the Regional District, the larger entity that is coordinating, funding, and regulating more on that scale. This is consistent with the observation that municipal jurisdictional boundaries are not well-aligned to watersheds. It was also noted by interviewees in the Alberni-Clayoquot region that the municipalities are fairly disconnected with

watershed governance and management; the convening on water supply, fish-flow, and agriculture is led by the regional government. In the Nanaimo region, the municipalities were listed as active participants in their own rights — largely as water purveyors — and also in terms of the regional initiatives led by the RDN, which they are party to.

All respondents spoke to the need for coordination across levels of government and connection with the community as key roles when considering watershed decision-making. From the network-mapping data and the verbal responses, the organizations that exhibit a combination of all four attributes — the ability to fund, the capacity to collect data, an active and close connection to the community, and having some level of regulatory authority — are the Regional District of Nanaimo (RDN), the Capital Regional District (CRD), and the Clayoquot Biosphere Trust (CBT). Importantly, across all the case study areas, CBT appears to be the most connected with First Nations (local to the Clayoquot area of the region), and this is in terms of providing funding, sharing data, and informal support. This is similarly observed with the Mt. Arrowsmith Biosphere Region (MABR) in the Nanaimo case study area — they are the group most connected to the local First Nations. Of all case study areas, the Alberni-Clayoquot region appears to have the most involvement of First Nations and Indigenous organizations in watershed governance and management initiatives. This is measured by the number and connectivity of groups working in this space, based on interview responses.

When interpreting these network maps from the perspective of complexity theory, the following generalities are offered in the literature: under-connected entities tend to struggle to adapt to environmental changes; partially connected (loosely coupled) entities are more adaptive; and over-connected (tightly coupled) entities can lead to gridlock (Eisenhardt & Bhatia, 2002 in

Kilduff & Tsai, 2003, p.63). Based on this, organizations with more connections have more diverse options for watershed governance resource flows — whether funding, informal coordination or facilitative support, data sharing, or formalized relationships — and inhabit a more adaptive space. However, too many tightly coupled connections between organizations (i.e., formal, regulatory) could serve as more of a barrier to action and minimize nimble response to issues.

Outcomes

Finally, to get a qualitative sense of perceived sustainability outcomes in each case study region, interviewees were asked to recall some examples and describe their or other organizations 'involvement. Below, the comments are summarized in terms of ecological and social outcomes in the case study watersheds, recognizing that the two are very much related, and also often capture economic considerations as well.

Ecological. Respondents from DFO, regional government, and some of the NGOs pointed to watercourse restoration projects, the result of multi-organization collaboration, as being key ecological successes at various locations within all three of the regions. This has involved riparian planting, in-stream habitat enhancement, daylighting piped creeks, and cleaning up pollution. In the CRD and RDN these projects were led by volunteer stream keepers with support from local government and Federal funders, and occasionally funding from Mosaic Forest Management. In ACRD, it seems often these types of projects are led by professionals working for Central Westcoast Forest Society, and involve training and employment of local First Nations, as well as community volunteers. The DFO respondent points to examples where fish are returning or continuing to come up the creeks because of the work that stewards are

doing to care for the streams, empowered by training and equipment from DFO community liaisons as well as by regional government partners. Another ecological outcome, which is not necessarily recent, but has, in the eyes of some respondents, improved watershed health, has been reforms to the Forest Practices Code and increased riparian buffers on forestry land compared to historic practices. Nanaimo and Area Land Trust pointed to successful agreements between the pulp mill (Harmac) and the City of Nanaimo to supply baseflow for fish in the Nanaimo River from their timed dam releases (NG4). West Coast Aquatic and DFO respondents noted a similar outcome on the Somass River with a multi-stakeholder Fish-Flow Committee working collaboratively on timing dam releases for fish flow, flood management, and hydropower (NG6, G2). In the Nanaimo region, respondents also indicated the success of monitoring programs involving citizen science to track surface water quality trends over time, and that data being used to inform action in community, local government, and provincial contexts (NG4, G9). From the perspective of the Indigenous organization respondent, the most important ecological outcome was the Ahousaht Land Use vision, announced in 2016, which "provides a great degree of economic, environmental, and cultural certainty" (FN1). It provides guidance to convert Tree Farm Licenses on crown land into First Nations-governed protected areas and sustainably managed First Nations forestry areas, as well as articulates measures of protection for freshwater, marine, and terrestrial areas across the Ahousaht territory (Maaqutusiis Hahoulthee Stewardship Society, 2016).

Another success, from the perspective of an NGO respondent, was the development of risk assessments for salmon, generated through the Roundtables, to understand underlying root causes of issues, using the process of multiple knowledge systems (NG6). These risk

assessments lead to restoration prescriptions that get support from grant funding so they can be implemented on the ground. That is a great example of both ecological and social outcomes, leading to the next section.

Social. Increasing collaboration and building relationships was often cited as a positive social outcome in all three case study regions. Linked to this, respondents often cited both Roundtables and participation in multi-stakeholder committees as the key vehicle for the collaborative success (FN1, G2, G9, IA2). In particular, the Indigenous organization representative described "growing our organization's capacity to participate in collaborative exercises like the Clayoquot Salmon Roundtable" (FN1) as a successful outcome. Cooperation across local governments in the RDN was mentioned as a positive outcome (NG1, G9), and with private forestry in terms of the Nanaimo River drinking watershed in particular (IF1). In the Alberni-Clayoquot Region one successful outcome, again related to relationships and collaboration, is the recent establishment of an agriculturally focused water committee, supported by senior government grants and the ACRD. Another small but notable success that was described was the trust built around watershed restoration projects that generated positive relationships between local biologists, stream keepers, and farmers (IA2).

Public education and its role in changing mindsets was a success pointed to by a couple of interviewees, along the lines of people in the community beginning to look at creeks as living ecosystems not just as water drainages (G4), and the shift towards the new normal of reduced lawn watering (NG1). This was also echoed in terms of how information sharing at Roundtables gets people thinking differently about the watershed and each other as partners (G2).

Provincial government respondents pointed to the success in building science-based decision making through increased data collection and sharing of information across levels of government to inform water authorizations and land use planning (G5), and supporting other groups ' sustainability outcomes by facilitating across sectors (G7).

Related to the success in increased knowledge transfer is the community participation in citizen science networks within all three of the case study areas. These are convened by regional government and NGOs. One NGO respondent pointed to the success of their organization being able to support smaller (stream keeper) groups because they are a formalized Trust with a bank account and insurance, and they can serve as an umbrella organization for other community non-profits that are small and informal (NG4).

At the regional government level, interviewees cited the positive outcome of "public support through tax requisitions" (G6) related to watershed governance and management, as mentioned previously. This represents a sustainable financial basis for, in the Nanaimo region, a program focused on watershed education, science and planning, and in the Capital region, acquisition of park land that supports protection of watershed function. A sustainability outcome unique to the CRD, linked to the strong resources they have from their tax base and the history of land ownership in their regional water supply area, is their total control over their drinking watershed.

One west coast NGO respondent described a social outcome related to the positive ecological outcome of watercourse restoration work they have been engaged in with First Nations and local and senior government: Nations are getting more recognition for their rights over the land and waters. One specific example shared was that the Ministry of Transportation

and Infrastructure is financially reimbursing Tla-o-qui-aht First Nation for the highway project on Kennedy Hill for the damage that's been caused (NG2).

Discussion

Based on my research findings, it is evident that there are numerous types of organizational arrangements that exist with the aim of watershed decision-making, and some of them have led to sustainability outcomes such as increased collaboration on water release from dams for multiple values, watercourse restoration, long-term funding mechanisms, citizen engagement in monitoring and data collection, and employment for local First Nations. From the results of my study, some key principles have emerged that provide a new lens on organizational arrangements than I had when I started. In this section I will dive further into some of my findings that align with broader literature and begin to shed light on pathways for transformation of organizational roles and relationships to support sustainable watershed outcomes in the context of various social-ecological systems. First, I will offer overall emerging principles, then I will review the context-driven differences between the case study areas, and finally I will discuss the unique roles and relationships that regional government can inhabit in the watershed governance space, based on my analysis.

Emerging Principles

Multiplicity. There are multiple ways of knowing water — as individuals, we know water through experience, through reading and study, through listening to others' experiences. Where I find meaning with water originates in my personal perspective that flows into my professional perspective. How I *know water* versus how I *know about water* is the difference between my connected relationship with water and my abstracted observation of it. I have a role

— in my profession and as a researcher — but that informs only part of my relationship with water. I know water through my mind, I know it through my heart, I know it in my spirit, I know it with my body. Water is a thing of sensory beauty— its sounds, its texture, its appearance, its taste, its smell. It brings life, it heals, it cleanses. It can also cause damage, inconvenience, or discomfort. Water is that multiplicity.

Just as water embodies multiplicity, so do each of us, with our diverse perspectives of water, watersheds, governance, collaboration and what determines success. To arrange our organizations in a way that is coordinated and complementary, we need to understand what we mean by watershed governance, not to homogenize the multiplicity of meanings held by various actors but to seek coherence between them. There is an inherent multiplicity in trying to understand the relevant boundaries for land and water management, a sub-watershed, a basin, a collection of basins. We can look at where water flows, where organizations exist, where jurisdiction exists. But to manage the multiplicity, it may be useful to understand boundaries as places of interaction, not as a hard line of control or attention (Bateson, 2016). As described by Medd and Marvin (2008), "through the metaphors of fluidity, questions about what it will mean to translate sustainable water management from strategy to practice…move away from a focus on integration. Instead, we move to explore processes, flows, movements, open boundaries, informal relations, etc." (p. 297). In other words, it is not about integrating organizational perspectives until they form one unified view, it's about crafting coordinated responses to water governance and management dilemmas with an appreciation of different perspectives (Zurita et al., 2018), and view this as an ongoing process rather than a fixed goal. This includes

appreciation for the view of collaboration and governance as taking place in direct relationship with the land and water itself, not as actions exclusively between people and organizations (FN1).

Multiplicity also is a factor in terms of roles and responsibilities. There is the need to hold this tension between the desire for certainty of knowing who does what in every case and allowing for a multiplicity of roles to serve various contexts. As articulated by Teisman and Edelenbos (2011): "It is not about creating one institutional structure to realize or enforce integration, but to develop an institutionally rich environment (Imperial, 1999) in which roles and actions overlap. (p. 113-114)." Further, they cite Ostrom (2005) in asserting that 'patchworks 'of self-organizing institutions are desirable when considering organizational arrangements for governance, because of the ability to more nimbly reorganize according to the tasks and challenges at hand (Teisman & Edelenbos, 2011, p. 114).

In some contexts, it may make the most sense for a well-resourced NGO to take the role of convener; in others it may be regional government performing that role. In some cases, the Province is best positioned to be the lead regulatory authority; in other cases, it is better to delegate authority to the local First Nations. The conditions that determine which role an organization takes are hyper-contextual and place-based. For example, MHSS and the Ahousaht Nation have developed a land use plan for the watersheds in their ancestral territories. This positions them well to take the role of managing Tree Farm Licenses in these areas and setting out freshwater management criteria (Maaqutusiis Hahoulthee Stewardship Society, 2016). This

in turn provides a strong basis for the Province to recognize the leadership and authority of the First Nation and embrace the fluidity of their own role given the context.

Accepting and productively using the concept of multiplicity and fluidity (Medd & Marvin, 2008) helps us see that governance is not an organization structure, but a set of interactions involving many actors across various scales, with different forms of authority, emerging into processes and results (Teisman & Edelenbos, 2011, p. 114). Having a multiplicity of organizational forms engaged in watershed decision-making means there is a diversity of access points to mobilize action and resources in support of sustainability (Westley et al., 2013). However, Westley et al. (2013) point out that when multiplicity is too great, resources may be fragmented and difficult to amass in large quantities; yet without multiplicity, innovations and improvements in the system will be challenged to gain traction. There is a balance to be struck. As summarized by Heikkila (2017), while multiplicity can add to the complexities of watershed governance, organizational and institutional diversity can ultimately "foster creative problem solving, social capital and new networks, and adaptability to local conditions" (p. 18).

Capacity. We cannot speak of coordinating the decisions and actions of the many actors and organizations whose interests intersect with watershed boundaries without addressing their corresponding capacity to participate and play their roles in governance (Simms and De Loë, 2010). Collaborative governance arrangements rely on various organizations being resourced to participate in terms of human resources, expertise / technical resources, and financial resources. The distribution of resources and capacity differs depending on the place and on the organization itself. Some organizations may have the staffing capacity and expertise to provide training to others, in terms of technical skills like water monitoring or restoration, as seen with one of the

organizations I interviewed, Central Westcoast Forest Society. Others many have the capacity to

requisition tax dollars to purchase land for watershed protection, as seen with the CRD. Others

yet may have the capacity to facilitate a process that brings groups together based on their earned

trust and credibility, as seen with several organizations I interviewed, including some NGOs as

well as regional government.

Building capacity of organizations to fill multiple roles is an important consideration.

Huitema et al. (2009) describe that "high collaborative capacity" within a social-ecological

system such as a watershed, may be correlated to the presence of an "institutionally rich

environment" where multiple organizations have overlapping roles to play in water management,

engaging in partnerships, and even power-sharing. There can be economies of scale in dividing

tasks across government bodies, having greater citizen involvement (in education and

monitoring, for example), and social learning taking place in collaborative environments, in the

form of increased levels of trust between organizations and greater success in advocating up to

higher-level authorities, as described by a number of my interviewees and reinforced by the

literature on adaptive water governance (Huitema et al., 2009).

In some contexts, my interview respondents referred to "capacity issues" hindering First

Nations' ability to engage in the multi-level watershed governance activities or roundtables,

"amongst everything else those communities are dealing with" (NG4, NG6, NG1). One

provincial respondent noted that sometimes there are funds transferred to First Nations as

"capacity funding; but really it's to support data collection", so not necessarily provided as

ongoing resources to support participation in other governance activities (G5). This seems to be a

key arrangement that needs to be addressed: how Indigenous organizations and First Nations can

gain capacity (in terms of time and resources) to participate and be full partners in decision-making about the lands and waters, beyond a formal consultation process but more in a multidimensional approach that includes stewardship, education, coordination, data collection, monitoring, and policy development.

The provincial respondents described their capacity in terms of expertise, and recognized the varying levels of capacity in local governments and First Nations (G7). One NGO noted the capacity of the Province to provide support, knowledge, and feedback on community watershed initiatives like water quality monitoring and stream restoration had diminished over the years, and feels it is currently a gap (NG3). This illustrates how the Province could be engaged in capacity-building of local groups, which would ultimately help the provincial government deal with their own capacity issues, but it first requires Province having sufficient capacity to distribute that capacity in the first place!

Forums. In all three case study regions, roundtables were mentioned as semi-formal arrangements that bring various watershed stakeholders together in dialogue and serve as a hub for collaboration. In the Alberni-Clayoquot region, these roundtables are salmon-focused and funded by DFO, who routes the funding through First Nations to hire a neutral facilitator — the West Coast Aquatic Management Association. Because the Alberni–Clayoquot region is a large area made up of several watersheds, the roundtables are sub-regional, focused on the basin scale for two in particular: Barkley and Clayoquot.

In the Nanaimo region, there is a roundtable focused on the Nanaimo River Watershed that was initially convened by the Nanaimo and Area Land Trust following a symposium they organized in 2011 which culminated in the shared desire to foster more collaboration across

stakeholders in the watershed to share information and collectively address issues of water quantity, quality, and recreational access etc. It is more broadly focused on the watershed as a whole, the land and the water. The Mount Arrowsmith Biosphere Region also convenes a roundtable for stakeholders with an interest or responsibility within its boundaries. One interviewee from this case study area also noted that there was previously a roundtable focused on the Englishman River Watershed Restoration initiative, but it dissolved following the passing of a key member of the Mid Vancouver Island Habitat Enhancement Society (MVIHES) who facilitated the meetings. The previous roundtable reportedly never had formal terms of reference; participants from senior government, local government, forestry, and academia participated voluntarily. But since it was not formalized, the organizational commitment to participate did not stand the test of time once a dedicated convener was no longer at the table (NG3).

Interviewees from the Capital region did not identify prominent ongoing roundtables, but noted that there was one working with the Gorge Waterway and a few working groups with the Esquimalt and Songhees First Nations. Reportedly there is a "fishery-based roundtable in development for the Sooke area, supposed to be led by the T'Souke First Nations, that is slowly coming together as it happens" (G4).

DFO respondents readily identify roundtables as successful means to share information and develop better relationships with stakeholders in the watershed. Participants in the salmon-focused west coast roundtables described that those forums are an opportunity for their organizations to provide influence but that DFO remains the decision-maker (FN1, NG2). The Indigenous organization interviewee pointed out that there is no regulatory connection from the

roundtable to DFO; the members of the table can provide data and information via that network but DFO is not seen as obligated to act upon it (FN1). The organization tasked with facilitating the roundtables on the west coast described it a bit differently, that "while not legislated, even some government folks will describe the roundtables as a true co-management. Government will set the box: these are the regulations. How you express outcomes and decisions within those bounds is placed at the roundtables" (NG6).

In the Nanaimo region, the Mount Arrowsmith Biosphere Region representative talked about the informal nature of their roundtable as a "very conscious creation of a form of governance where everyone is there because they want to be there" (NG1), which was further described as fragile, echoing the perspective of MVIHES as to why their Englishman River Watershed Roundtable dissolved several years ago. Interestingly, one of the First Nations chiefs that participates on the Mount Arrowsmith Biosphere Roundtable disagreed that it was fragile, and reportedly said to this respondent that it's the most solid group that they sit on (NG1). It is important to note that senior government (Federal or Provincial) are not members of that Biosphere roundtable, so the power dynamics are likely quite different than other tables where DFO, for example, is a strong presence and one that is also funding the table. So, while the fragility of being informal means people are not obligated to show up, the shared purpose in the middle of the table can be enough to pull people together in a flattened hierarchy, especially if the terms of engagement are equitable and First Nations feel empowered as participants. Another respondent backs this up: "it doesn't always have to be that formal… for example some First Nations groups aren't as keen, just one example I've experienced, to have really formalized agreement, but you have an understanding of what people's interests are, what their time

commitments [are], what their focuses [are] and what the expectations are from right off the start, and then you can kind of work towards a shared goal" (G8). This speaks to the potential for informal arrangements to provide more latitude for collaboration and engagement but doesn't preclude the additional value more formal arrangements could bring such as Nation to Nation or Government to Government relationships.

Another watershed-oriented forum that exists in the Nanaimo region is the RDN's Drinking Water and Watershed Protection Technical Advisory Committee (TAC). It is comprised of local government staff, staff from several provincial ministries, a professional hydrogeologist, at-large community representatives, people from academia and forestry and more. This multi-stakeholder committee's role is to advise on the implementation of the RDN's DWWP Action Plan, and to provide guidance and expertise on related projects and initiatives. It currently does not have elected representatives, and operates purely as technical advisors, with meeting minutes going to the RDN Board for information. This committee is potentially less 'fragile 'as it has a reporting structure and terms of reference linked to a local government entity.

Another respondent, from the west coast, described the risk of a roundtable being co-opted by special interests if there is a lack of a science basis or knowledge base to vet information that is presented to the table and [to] guide the direction (NG5). They go on to express that the Clayoquot Salmon Roundtable is, "in effect, a paper table", essentially sharing the sentiment that it's good on paper but not as effective in reality (NG5), because it has been co-opted by the aquaculture sector, according to that same interviewee. This aligns with another respondent's emphasis on the reciprocity of how roundtables must operate in two ways, allowing members to bring concerns forward but then also relying on the powers at the table actually

taking that information away to get something done about it (NG4). Having a forum like a roundtable that brings various stakeholders together to discuss common interests is a valuable way to work on things that individual organizations aren't doing alone (NG6), or can't do in isolation, yet there is frustration with how it is liable to get sabotaged, distracted, or co-opted. The absence of the Province was also noted as a "pinch point" perhaps hindering the Clayoquot roundtable's ability to fully advance effective watershed-based co-management (NG6).

This corresponds to some concerns that were raised by one NGO respondent from the Nanaimo region when considering the Mount Arrowsmith Biosphere Roundtable and the RDN's Drinking Water and Watershed Protection Technical Advisory Committee: are the right people there? Is it at the right scale? The Biosphere Roundtable was not seen by this interviewee as having all the right players (lacking community representation and senior levels of government) and the DWWP TAC was seen as operating at too large a scale, encompassing seven water regions rather than a single watershed or basin as its focus (NG3). Similarly, on the west coast one respondent suggested that if the roundtables moved from the salmon-focus to a full watershed focus and engaged more with local government (and First Nations) land-use planning, it might be more effective and less subject to being steered by the aquaculture industry (NG5). Hints of the same concern with industry swaying the direction of the roundtable was expressed for Nanaimo River Watershed Roundtable as well — in that case the forest industry — however, the overall sentiment expressed by the respondent that spoke to that forum was, more than anything, that the roundtable has allowed a degree of trust to be built between the forest company and the other stakeholders, which has been a benefit for everyone in seeking collaboration in the watershed (NG4).

Roundtables and advisory committees could be described as semi-formal arrangements. They often have terms of reference or guiding principles, sometimes have participation of elected officials, but they are not so formal as to have delegated authority. Another arrangement that was spoken about by my interviewees but does not currently exist in the case study areas, is the more formal Watershed Board. This exists on Vancouver Island in the Cowichan region. It is described by one of my respondents as "strong" and "solid" with all levels of government and the community "buying in" (G4). The respondent goes on to describe that there is an effort to make it an authority, which is interpreted to be delegated authority from senior government for overseeing all activities in the watershed. Something similar is described by West Coast Aquatic, who speak to how the arm of their organization known as the Governance Board is interested in becoming a delegated management authority of aquatic resources on the west coast of Vancouver Island. This is envisioned as a co-governance approach, as the Board is comprised of Nuu-chah-nulth First Nations, federal, provincial, and regional government representatives, as well as industry stakeholders ([West Coast Aquatic, 2017](#)). It was reportedly recognized under the Oceans Act when the group originally formed in 2001, but: "it never quite came to fruition because of changes in DFO's kind of focus and mandate, but people still want to really see that and kind of feel like now if ever there was the time this would be it. When you talk about advancements in Indigenous rights, look at where reconciliation is going, people are starting to understand needing to manage as a system" (NG6). A complicating factor that has been touched on previously in this paper, is the split of authority over marine waters and freshwater between the federal and provincial governments. If authority were to be delegated to a watershed entity, theoretically it would have to not only be authority from DFO over marine but, importantly, it

would need to be authority from the Province over freshwater and land-based resources such as forestry. This would be a truly novel arrangement for decision making: to not only vest the authority with an entity comprised of multiple levels of government including First Nations but to also dissolve that separation of jurisdiction over marine and freshwater that exists with DFO and the Province. Of all three of my case study regions, perhaps the sub-region of Clayoquot is best positioned to have a novel arrangement like this emerge as a possibility, given the entities currently engaged and their trajectory.

Reciprocity. Different motivations generate different outcomes. If organizations are motivated by efficiency, or by avoiding conflict, or by ownership rights or profits, or by legal authority, that is very different than being motivated by giving back to the ecosystems that sustain them, or by protecting or conserving lands and waters for intrinsic or common good, or by being deeply connected to place. Are our organizations motivated to extract value or add value?

Organizational motivations, according to the people I interviewed stem either from a legal perspective (senior government, industry) or from a place-based, community perspective (NGOs, regional government, Indigenous). All describe the ethical motivations behind their work as professionals or community members, but not often is reciprocity an underlying motivator. Including reciprocity as a lens for watershed governance would mean organizations that dish out regulation would also meaningfully receive and integrate input and advice from those affected. It would mean those that are taking from the watershed's resource base are also giving back to that land and water and community in terms of providing needed protections for biodiversity, limits to extraction, and equitable economic and cultural prosperity. It would mean

if local levels of government and community organizations were engaged in important facets of

watershed governance — like data collection, coordination across stakeholders, capacity building

and support for rights holders — that the Province, as the organization with the vested authority,

should reciprocate in terms of providing resources to keep that conduit of information and

communication going, as ultimately it helps them advance their responsibilities around managing

and governing land and water for the benefit of the people in BC.

Context-Driven Differences

Another principle that bears a closer look is the fact that context drives which

organizational arrangements are tenable at a given time in a given social-ecological system. That

said, context is not a prison and it does not always preclude other possibilities, particularly if we

are open to the fact that multiple contexts are always interfacing, and therein lies an opportunity

for creating new potential configurations and relationships. In this section, I will explore four

defining features that presented themselves in the interview data that I analyzed: population, land

ownership, First Nations context, and presence of a UNESCO Biosphere designation.

Population. Contrasting the three case study areas and their varying population base to

land base ratio, Capital region has the largest population (418,000) and the most density, with

Alberni-Clayoquot having the smallest population (31,000) and the least dense distribution of

settlement. With population comes heightened land use pressures and potential for resource

competition; however, a larger population also means a bigger tax base to fund regional

programs and services. This is apparent with the CRD's ability to purchase and manage large

tracts of forest land in their regional drinking water supply area, and the total revenues they are

able to obtain from the parcel tax for land acquisition for parks, for example. The CRD has a strong presence in the community and resources to support stewardship groups' environmental efforts.

The Nanaimo region has a significantly lower population (155,000) and therefore a smaller tax base, yet the RDN has been able to respond to community desire for water sustainability and watershed management across jurisdictions by establishing a service area complete with parcel tax requisition for water-centric education, science, and planning within the region, as described earlier. This community desire for action on water sustainability issues stems from the concerns that the growing population will outstrip water supply and impact water quality as well as aquatic habitat. While the Province is the freshwater regulator, it is easier for community members to advocate for their service desires at the local level, which translates into a request placed on regional government to take an elevated role in ensuring development does not compromise water resources within the added context of climate change.

In the more sparsely populated Alberni-Clayoquot region, the tax base does not support significant land purchases and there has not yet been a move to establish a dedicated service and revenue stream for drinking water or watershed protection. Even if the region were to establish such a parcel tax funded service similar to RDN, its per parcel requisition would have to be much higher in order to reach a similar resource level for programming. That said, there is no one perfect level of resourcing; there could be gains seen with a more modest budget that still provided dedicated funding to a combination of initiatives in water education, local science and data collection, and policy and planning advocacy, with the advantage of having a place to coordinate those efforts on a regional level and a long-term financial support, even if it operates

at a lower service level than neighbouring higher-populated regions are able to enjoy. With less pressure in terms of population growth there may be less urgency from a water supply perspective. Yet it should be noted that the annual tourism draw to the west coast generates seasonal spikes in population — in particular to Tofino, where, in 2018, a normal year pre-COVID, they reached an estimated 600,000 individual visitors (InterVISTAS Consulting, 2019) — simultaneously creating a source of tax revenue and a pressure on limited summer water supply.

Land ownership. As briefly mentioned in the introductory section on Research Context, the historical E&N land grant resulted in privatization of forest resource lands in the upper watersheds of the majority of the Nanaimo region, and the Alberni portion of the Alberni-Clayoquot region. In most other places in the BC, including the Clayoquot portion of the Alberni-Clayoquot region, forest resource lands are owned by the Crown and managed as Tree Farm Licenses where woodlot operators are regulated directly by the Province. On private forestry land, the regulatory mechanism is arms-length from the Province via the Private Managed Forest Council, and it is a voluntary opt-in for private forest landowners. If landowners opt in, they commit to manage their property for long-term forest production, including meeting legislated objectives for key public environmental values, including fish streams and drinking water intakes (Province of BC, n.d.-c). In locations where the upper watershed areas are owned and managed privately, there was a general sentiment expressed by my interviewees that community and ecological values are not prioritized and a general displeasure exists with how little say or control local communities feel they have over land use practices and forestry activities in the watersheds that support their community's drinking water (G3, NG3, IA2).

Roundtables have provided a forum for private forestry to build trust and relationships with local communities and governments. However, influence still was felt to be low by local governments and community organizations. Contrast that to the Capital region, where the CRD owns and manages the upper watershed areas that supply the regional drinking water system. This key contextual difference generates another identity for the regional government: land manager as well as water manager. This context is rare, given the costs associated with this role and the historical milieu that precludes it. Therefore, it cannot be presented as a reasonable 'solution 'to watershed governance in many cases.

First Nations. This is an extremely nuanced and complex contextual piece in each case study region, and for any region in BC. As it was not a focus of my study, I cannot make any in-depth observations, yet I would be remiss to not include mention of how First Nations capacity, engagement, priorities, and history of relationships in a social-ecological system influence the organizational arrangements of other entities working on watershed management and governance.

Treaties are an important piece of context, very different for different First Nations and couched in particular perspectives that will be unique to the various Indigenous communities in the Province. As described on the BC Treaty Commission website: "Section 35 of the Constitution Act, 1982, affirmed that aboriginal title, and the rights that go along with it, exist whether or not there is a treaty. However, Section 35 does not define those rights and [...] Treaties provide certainty and will clarify aboriginal rights and title, ownership of BC's land and resources" (BC Treaty Commission, 2021). It is important to bear in mind this is 'clarity 'in

terms of the colonial perspective; it is already very clear to Indigenous communities where the rights and title rest.

First Nations and Indigenous communities with larger memberships may have more resources in terms of capacity (time) to engage with other levels of government, industry, and the wider community on watershed management issues and co-governance initiatives. The disparity in capacity across various Indigenous communities can be problematic, and sometimes low capacity can preclude their ability to participate. This capacity issue should be addressed prior to watershed governance activities proceeding without meaningful engagement with First Nations.

As well, each Indigenous community and Nation will have its own strategic priorities and community needs to focus on. Imposing priorities from outside the community is not a healthy way to engage, so other organizations would do well to learn about the context that Indigenous communities are existing within, and be prepared to support those issues – health, housing, safety— prior to assuming their focus will be on watershed-related projects.

In some contexts, Indigenous communities will have allies or partnerships outside of the usual community organizations and other levels of government — for example, in the Clayoquot region, Maaqutusiis Hahoulthee Stewardship Society, the Indigenous organization that represents Ahousaht Hereditary Chiefs, has been backed and supported by The Nature Conservancy Canada (TNC) in a technical sense as well as in fundraising a stewardship endowment fund to support the implementation of the Ahousaht Land Use Vision (Maaqutusiis Hahoulthee Stewardship Society, 2017).

UNESCO Biospheres. In two of the case-study contexts, UNESCO Biosphere designations exist for part of the regions of interest. The designations correspond with an

affiliated organization that administers the requirements of UNESCO in order to maintain the Biosphere designation. This appears to open up even more pathways for novel arrangements and relationships among organizations, community members, academia, First Nations, and government bodies. It provides an entity well-suited for neutral third-party convening of networks that are not overburdened by regulatory relationships. However, funding arrangements for these types of organizations are variable and it is not likely that UNESCO will designate many more Biospheres, so its replicability is limited.

All of these variables somewhat describe a path dependency (Pierson, 2000), in that origins and context matter and reveal certain possibilities and pathways for transformation of a social-ecological system. In each SES, it is important to be savvy to these variables and others, so that organizational arrangements for watershed governance can use an understanding of path dependency productively, to intentionally shift to sustainable alternatives, rather than being problematically stuck in a trajectory or fighting it (Ekstrom & Young, 2009).

Niches for Regional Government in Watershed Governance Arrangements

Now I will funnel the discussion of emergent principles and defining contextual features to culminate with a focus on what niches regional government can and do fill in the organizational arrangements for watershed governance in these case study areas and extend those findings in terms of possible application in other regions of BC.

If we think in terms of reciprocity — what can an organization give — we can orient their respective niche in a web of connected groups working towards similar goals according to

what is uniquely in their capacity to provide, to best serve the greater need. It requires self-reflection as well as sensitivity to others. As pointed out by author Adrienne Maree Brown in her book *Emergent Strategy* (2017), which is focused on community organizing: every organization and member of the community holds pieces of the solution, even if they are each involved in different layers of the work. Through my experience and my research, the following are aspects of governance that regional government appear to be particularly suited to, in terms of watershed decision-making in the context of my case study areas on Vancouver Island.

Close connection to community. In contrast to the provincial level of government, and certainly the federal, regional government operates at a scale that is more proximal to the community, more connected at the level of residents 'everyday needs, and more familiar with local places and sense of place. Regional government has more access to civil society leaders, more interface with the public, and arguably more agility to establish informal relationships with community groups, compared with senior government. Additionally, regional government's sphere of interest and influence better aligns with watershed boundaries than either provincial management regions or municipal jurisdictions.

Some regulatory authority and influence. The powers vested in regional government through the *Community Charter* and *Local Government Act* allows for the establishment of services and bylaws that reflect their communities 'needs and desires ([Province of B.C., n.d.-b](#)). So, while they are not the overarching freshwater regulator, regional governments can enact some legally enforceable actions related to freshwater protection, such as sprinkling restrictions in their water service areas, watercourse and/or aquifer protection development permit areas, and

other land development -related regulations. The fact that they hold some regulatory authority, but not all of it — for example, water licensing, source water protection regulations and forest resource land practices are all provincially legislated — gives regional government the credence of authority without the problematic power dynamics of being the superseding level of authority, like the Province.

Reliable long-term funding mechanism. Part of their powers include being able to establish tax requisitions for regional services. This provides regional government with the ability to, through elector assent or alternative approval processes, create funding mechanisms for region-wide programs directly related to watershed protection, beyond just the administration of water service areas for drinking water provision. Two examples were provided earlier in this paper from the RDN and CRD. In comparison to the often fundraising- or grant- reliant NGOs, this is a sustainable way to fund and staff efforts for long-term integrated watershed management and governance. It also provides a funding source that can be further distributed throughout the community by way of transfer to community partners, to assist in some of the activities or delivery of initiatives. It is also a focused funding source that is directed within a particular geographic region, whereas provincial funding pockets often have to rotate to various locations across BC, without a long-term funding stream to any one region in particular.

Convene across levels of government. Because of the three aforementioned aspects, regional governments are suited to a coordinating and convening role, at the individual watershed level or the multi-basin regional level, depending on the local geography. It has been especially shown, at least in the small sample of my case study areas, that regional government has had more success engaging the Province in activities, funding, and committees than the NGO

sector. It is important that the regional government use this ability to convene and coordinate across levels of government in a manner that also includes the community. Regional governments are naturally a convening body for municipalities, given the governance structure of the Regional Board, being comprised of municipal councillors as well as electoral area directors. In particular, committees or boards convened by regional government have a spectrum of formality available to them — from informal working groups, to advisory committees, to commissions or boards with decision-making powers.

Well-positioned to support First Nations leadership. The combination of aspects listed above culminates with the important observation that in many ways, regional government is in a strong position for supporting First Nations leadership on watershed governance. As reported in the results section, several interviewees suggested this as an important arrangement to consider. What might collaborative arrangements for watershed governance look like with Indigenous communities and First Nations leading? That question warrants further research with many more voices contributing; however, I can discuss what has emerged for me in this research to add to a much wider conversation.

Regional governments could use their organizational position to convene across government levels and establish a service area with the funding and staffing to support data collection, community engagement, and policy advocacy, including in direct support of Indigenous community watershed planning efforts. This would likely require additional funding and capacity-building to support First Nations leadership, from both NGOs — who can access unique endowments, grant funds and fundraising opportunities — and from senior government in the sense that if they truly want to commit to reconciliation with First Nations, they should be

obligated to assist those communities in building capacity to participate. However, as a neighbour on the ground, sharing the land and using the water within the traditional territories of Indigenous peoples, regional governments and their communities have an important role to play as allies and can provide access for First Nations at their governance tables, if that is a chosen mode of engagement.

For example, in Alberni-Clayoquot, the Huu-ay-aht First Nations and Yuułuʔiłʔatḥ Government have joined the ACRD Regional Board, and are now formally part of that existing regional governance structure, and formally recognized by way of Treaty as having their own governing constitutions. (It should be noted that there are several First Nations in that region that have not chosen to, or not been able to, take that route yet). This is a unique arrangement that is currently not seen in either the Nanaimo Region or Capital Region. It comes back to the discussion on context-driven differences in SES: the varying circumstances result in different arrangements that exist and are possible.

For regional governments to beneficially use these niches within the interconnected web of organizations working within the watershed context, there would need to be corresponding actions taken by other organizations in other niches within the system. Senior government would need, to a certain extent, to concede, and empower, legally recognize, and rematriate (R. Wall Kimmerer, Personal Communication [Webinar], January 29, 2021) First Nations peoples to their ancestral lands and waters. Currently it is just Crown Land that is considered under negotiations for Treaty Settlement Lands, and private property (fee simple land) is not on the table except on a willing-buyer, willing-seller basis (BC Treaty Commission, 2021b). This provides an added

layer of complexity in the case study regions where the historic E&N Land Grant has resulted in vast swaths of forest resource land in the upper watersheds being owned by private companies. Perhaps the private forest industry landowners could be compelled by provincial regulations to co-manage with First Nations. Or perhaps certain watershed areas could be co-purchased by regional governments and First Nations to co-manage for the benefit of both communities, assuming there were financial resources to support that and they were dealing with a willing-seller. NGOs play an important role that cannot be overlooked in the discussion of regional government niches in watershed governance; this research has shown that when regional government is not playing a role in convening, data collection, funding or supporting community watershed initiatives, well-resourced NGOs can perform well in this space. Further, NGOs add value by being able to access diverse funding sources and provide an organizing structure for community volunteers (NG3, NG4, NG5).

Ultimately, each organization has a multiplicity of possible roles, identities, and perspectives they can lend to collaborative watershed governance arrangements. With the key elements of capacity, forums, and reciprocity, aligned with the contextual nuances of population, land ownership, Indigenous communities, and unique NGOs such as UNESCO Biospheres, each organization can find a balance of a consistency and fluidity, based in place.

Conclusions

Often complexity is spoken about as an impediment to effective governance, including by many whom I interviewed for this research. There seems to be this compelling human drive to simplify in order to improve operations, coupled with an aversion to complexity because it's not

straightforward, requires ongoing effort to manage, and doesn't offer the reward of being

'figured out 'because it is endlessly dynamic. In complexity, if balance is struck, it is not

guaranteed to be lasting, as inputs, drivers, and conditions change. Systems thinker Nora Bateson

describes it thus:" every time we look to simplify what is really necessary, we merely find out

that we have not sufficiently understood" (Bateson & Ward, 2017). She goes on to argue that we

need to add complexity to deal with complexity itself; complexity is a resource, not a problem

(Bateson & Ward, 2017).

Consistent with the CCRN framework for analysis of governance in social-ecological

systems (Berkes et al., 2014), this research explores the importance of meaning, motivation, and

outcomes related to organizational arrangements for watershed sustainability. Since watersheds

are complex social-ecological systems, it follows that analysis of organizations within this

complex system should meet that complexity with "flexibility to accommodate multiple

descriptions of each variable in that system" (Bateson, 2016, p.170). These multiple descriptions

have been presented with the interview results and network-mapping visualizations, and then

refined in the context of the literature and by my own experience and thinking as a practitioner

embedded in this space.

I set out to answer the question: *What types of organizational arrangements can support

sustainable watershed decision-making in the Vancouver Island context?* However, through the

course of this research my understanding of 'arrangements 'has evolved, understanding them to

be less fixed and mechanistic, and more dynamic and fluid: a set of relationships rather than a

structure. Relationships have proven to be a defining feature in my research results, extending

beyond relationships within and between organizations, to include our relationships with the

watersheds themselves. I set out to ask how can we sustainably manage our impacts on lands and waters, but in asking, discovered it is more about how we can be in relationship with our lands and waters in a way that honours the gifts rather than extracts the resources; in a way that fosters stewardship rather than privileges ownership; in a way that amplifies collective responsibility rather than promoting centralized power. It is not what can we sustain but what can we learn; not what we can maintain of the status quo but what unimagined potential can we express. It is less a question about the boundaries and extent of our control, and more about the interfaces of collaboration. It is less about criteria and more about principles. It is about holding this tension between certainty of lines of accountability and allowing for a multiplicity of roles. Indeed, our governance arrangements require a balance of consistency (for reliability, accountability, and clarity) as well as fluidity (for adaptation, evolution, and humility).

Place-based factors are essential in influencing what role or identity each entity plays or inhabits in a governance network and what set of relationships and responsibilities come into the situation. The reflexive practice for organizations in this space to consider aligns nicely with a sentiment from author, botanist, and Indigenous knowledge holder, Robin Wall Kimmerer (Personal Communication [Webinar], January 29, 2021): *know what your gifts are and how to give them in this world in the given context.* For organizations that would mean knowing: your funding mechanisms, your capacity to convene, how connected you are with the community, what regulatory authority you can exert, and how you can contribute to knowledge generation and transmission (i.e., data collection and communication). All of this self-knowledge must be grounded in an understanding of the other organizations that exist within your social-ecological

context in order to responsively arrange your activities and relate within the collective space of land and water management.

In particular, regional government can occupy an important niche in a multi-level framework for watershed governance in the Vancouver Island context, as revealed by interview data, literature, and embedded observations. As detailed in the discussion section above, this includes a unique combination of abilities: effective bridging to community; exercising some regulatory authority and influence; establishing reliable long-term funding mechanisms; convening across levels of government; and supporting First Nations leadership. Acknowledging these roles and relationships as core services provided by the regional level of government can result in a productive sense of identity that serves to further collective objectives to manage land and water in a harmonious way, to the benefit of regional communities and ecosystems.

Further research on watershed governance would do well to transcend the limited concept of contemporary sustainability when speaking about aims and outcomes, and shift to a focus on *regenerative capacity* of our social ecological systems to thrive and tap into their latent potential (Gibbons, 2020). What does it mean for an organization to be in not just a sustainable but a *regenerative* relationship with the land, water, and people? What does regenerative governance look like? In her writing about regenerative sustainability praxis, Gibbons (2020) suggests that "regenerative governance systems based on living systems principles enable purpose-alignment, resilience, and prosperity in organizations […] distribute authority and develop individuals as much as the organization as a whole and the communities they serve" (p. 8).

More work is required to link the organizational arrangements described herein to ecological and hydrological outcomes in the various social-ecological systems. This study set out

to elucidate the organizational roles and relationships at play, and these findings can subsequently inform interpretation of the social factors influencing watershed health from a quantitative lens when coupling these results with ecological data analysis. While this research found interesting examples of organizations leading watershed initiatives without full or formal authority, additional research on policy and legal frameworks available to local or regional government in the context of watershed management would also help extend the findings related to principles of organizational relationships, to further probe the aspect of authority and jurisdiction and how to apply it in watershed context.

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Appendix A – Interview Protocol

Introduction & Permission
This interview is part of a Masters 'Thesis project, for the completion of the Masters of Arts in Environment and Management degree from Royal Roads University. The title of the research is *Organizational Arrangements for Watershed Governance on Vancouver Island: Responding to Sustainability Imperatives.*

The purpose of this research is to identify what types of organizational arrangements exist in different social-ecological systems on Vancouver Island and how these arrangements might support sustainable watershed decision-making. It seeks to, through literature review, social network mapping and interview data, uncover pathways to transform organizational arrangements in response to water sustainability challenges through effective governance at the watershed scale on Vancouver Island.

I am the Principal Investigator, Julie Pisani, MEM student at Royal Roads University. My academic supervisor is Dr. Ann Dale and my thesis committee member is Dr. Laura Loucks, both affiliated with Royal Roads University.

Disclosure: I am an employee of the Regional District of Nanaimo, as the Program Coordinator of the Drinking Water and Watershed Protection Program. I am engaging in this research as a Master's student researcher, to advance the state of knowledge in this domain, not to advance my position or organization in any way. The completion of my degree is not linked to any promotion or increase in wages and was self-instigated, not requested by my employer. In order to minimize influence of bias I will be collecting enough detailed data that is then triangulated across sources to provide a rich description that increases the soundness of the findings.

I have presented you with a Consent Form where privacy and confidentially procedures are outlined, as well as the option to withdraw from the study at any time. Your signing of this Consent Form has granted me permission to proceed with interviewing you for this research purpose.

Opening Prompts

- I am interested to hear about your perspectives on organizational arrangements for watershed governance.

- I am using the regional boundaries of the [ACRD, RDN or CRD – show map image] to limit the geographical area of focus for our discussion. So, when I ask you questions please think about the answers within the context of that area.

- There will also be a section of the interview where you will be asked to draw a network map from your perspective. I will help walk you through that process and provide the materials you need to do so.

- Do you mind if I use a voice recorder? You can ask to pause the recording at any time.

INTRODUCTORY QUESTION

What brought you to work at [ORGANIZATION], and can you tell me a bit about your role there?

MAIN QUESTIONS

Meaning

For the purpose of this research project, I am using the following definition of watershed governance: *"The range of political, social, economic and administrative systems that are in place to make decisions concerning land and water management on the basis of watershed boundaries"* (adapted from De Loe et al. 2011).

1. What does effective watershed governance mean to you?

2. People apply many different meanings to the word 'collaboration'. When you say collaboration what do you mean?

   - Please identify, for the purpose of this interview, if when using the term 'watershed' you are referring generally to all watersheds in the region or if you are just speaking to a particular watershed or set of watersheds within the region [or regions if speaking to multiple cases]?

Motivation

3. What do you think motivates or compels your organization to engage in watershed management and governance?

4. How would you describe your organization's focal goals / objectives when it comes to watershed management and governance?

   - Are these goals and objectives aligned across divisions / departments (if applicable)?

   - Are these written in a guiding document or just understood among staff?

Role

5. What responsibility / power / control does your organization have with respect to watershed management or decision-making?

    ▪ Please speak to your department and to other internal divisions of your organization if you can.

6. What watershed governance aspects are <u>external</u> to the control of your organization? Who controls those aspects?

    a) What influence do you have over activities outside your control?

    b) What would your organization like to control but doesn't currently? And, why?

7. Do you feel like watershed management roles are well-defined / well-understood in your region?

    ▪ *Prompts: Are they flexible or rigid? Clear or nebulous? Fragmented or integrated? Synchronized or out of sync? Collaborative or competitive?*

8. What do you consider to be the most unique and valuable aspects about your organization's role in watershed governance?

NETWORK MAPPING

At this point there will be a change in the interview format.

• I will now walk you through a process of developing a network map of the organizations you see as key players in watershed management and governance in [region / or watershed].

• You will be asked to draw out the connectivity between organizations and characterize the relationships and structures, based on your knowledge and understanding.

• If your organization operates in more than one of the case study regions, then we will do multiple iterations of the network mapping to reflect each region.

Roles continued…

9. Please list organizations that are engaged in watershed governance or management in [REGION / WATERSHED].

These will be written on sticky notes by the interviewer as the interviewee names them, and handed to the interviewee to arrange in front of them on a chart paper. **

**Note: Following the outbreak of due to COVID-19 this was switched to a virtual format using a whiteboard app: inVision.*

Relationships

I will now ask you to draw linkages between the organizations to form a network map. (Optional) Strong linkages should be drawn as a solid line; weak linkages should be drawn as a dashed line.

10. What connections exist between these organizations that you are aware of?

Use the following colour scheme:

- Formal / regulatory (red)

- Flow of funds (green)

- Informal support (blue)

- Flow of information (orange)

As you draw them, could you describe how these flows are facilitated?

Reflection

11. Looking at the network map you have created, what are your initial reflections?

   a. Are there any gaps you see? Where are there opportunities that are not being explored, in your opinion?

Draw these potential future linkages in with purple. Write a descriptor beside the linkage line to describe the relationship (optional).

12. Could you describe for me what you feel is the most effective role for regional government to play in watershed management?

Outcomes

13. How would you describe the overall status of water resources and watershed ecosystems within your region? Can you speak to a particular watershed in more detail?

14. Think about specific sustainability outcomes that have been achieved in your region's watersheds. Can you list any of these outcomes?

   - How have any of the internal arrangements <u>within</u> your organization helped to advance sustainability outcomes? Or hindered the outcomes?

   - In terms of external arrangements <u>between</u> your organization and an/other organization(s), how have any of these arrangements helped to advance sustainability outcomes? Or hindered other outcomes?

WRAP-UP

- That brings us to the end of what I have prepared. Is there anything else you would like to mention?

- If you think of anything after today that you would like to include, please follow up by phone or email.

- I will describe how the research will proceed; next steps and follow up.