

Supporting Community Resilience: A Portrait of Community-based Responses to Marine Hazards in Canadian Coastal Municipalities

CCL Conference
May 28, 2018

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Introduction



Coastal Communities: Context

- Facing an increasing range of marine hazards:
 - Exhibit particular vulnerabilities
 - Canadian approach to hazards
 - Responsibility for response mostly at the local level
- BUT
- Limited guidance provided to help decision-makers select the best options for their community



Research Questions

- What type of responses are already in place? Do municipalities feel they have access to what they need?
- Decentralization of responsibility for hazards: is this matched with local capacity?
- Do these new responsibilities align with municipalities' priorities?

Methods



Coastal Municipalities: Criteria

- Incorporated
- Touches saltwater
- Participants:
 - Elected municipal representatives & staff
 - Individuals:
 - Key positions related to hazard responses
 - Have insights about or represent groups that could be strongly affected by marine hazards



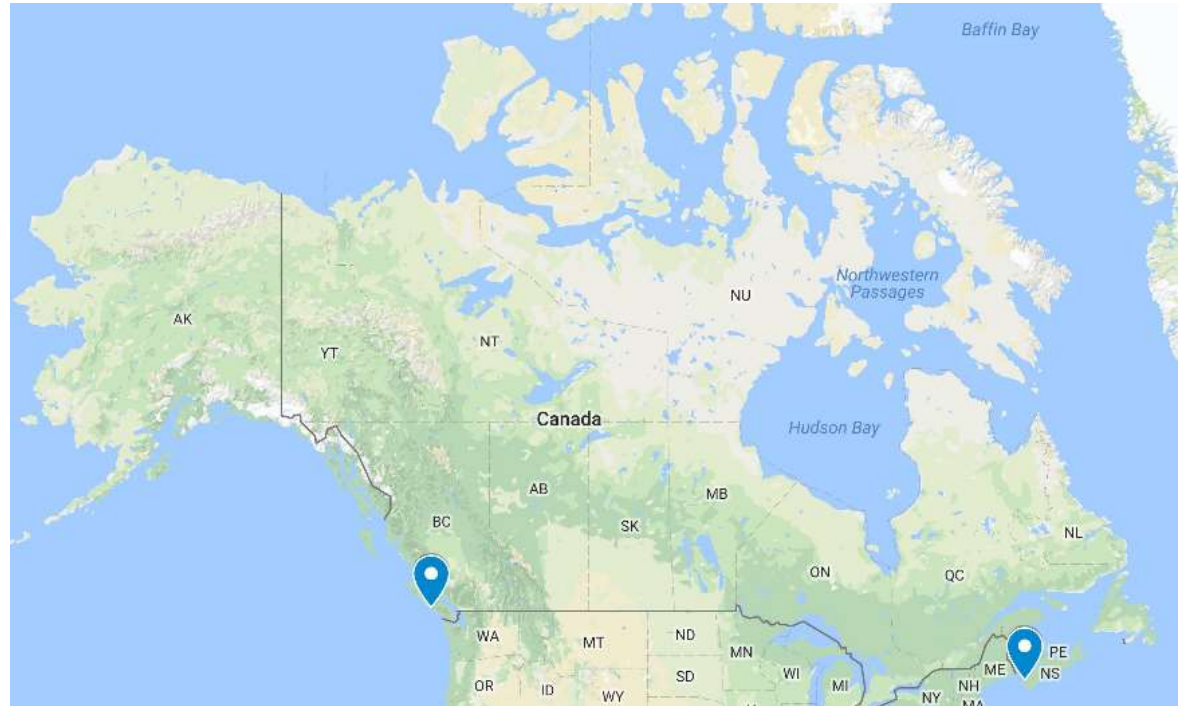
Methods: Questionnaire

- On line (and MS Word or pdf)
- Builds on previous surveys:
 - National Municipal Adaptation Survey (NMAP) (Hanna, 2014)
 - Making Strides on Community Adaptation in Canada (ICLEI, 2016)
- Target: all Canadian coastal municipalities



Methods: Case Studies

- Clare, NS
 - Population: 8018
 - Main economic sector: fisheries
- Tofino, BC
 - Population: 1932
 - Main economic sector: tourism



- Interviews
- Scenario workshops



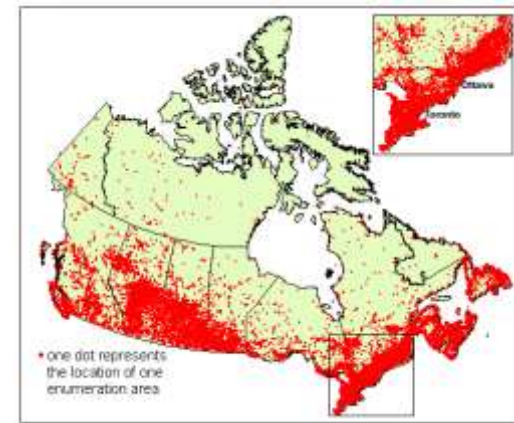
Preliminary Results



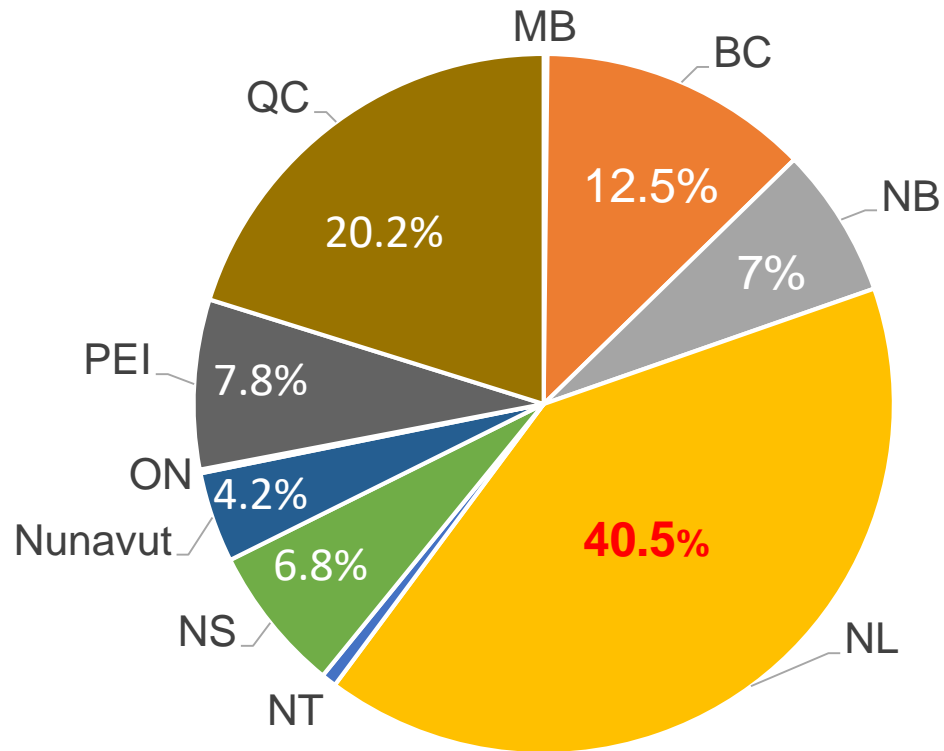
Canadian Coastal Communities:

Who Are They?

Number of Incorporated Coastal Municipalities

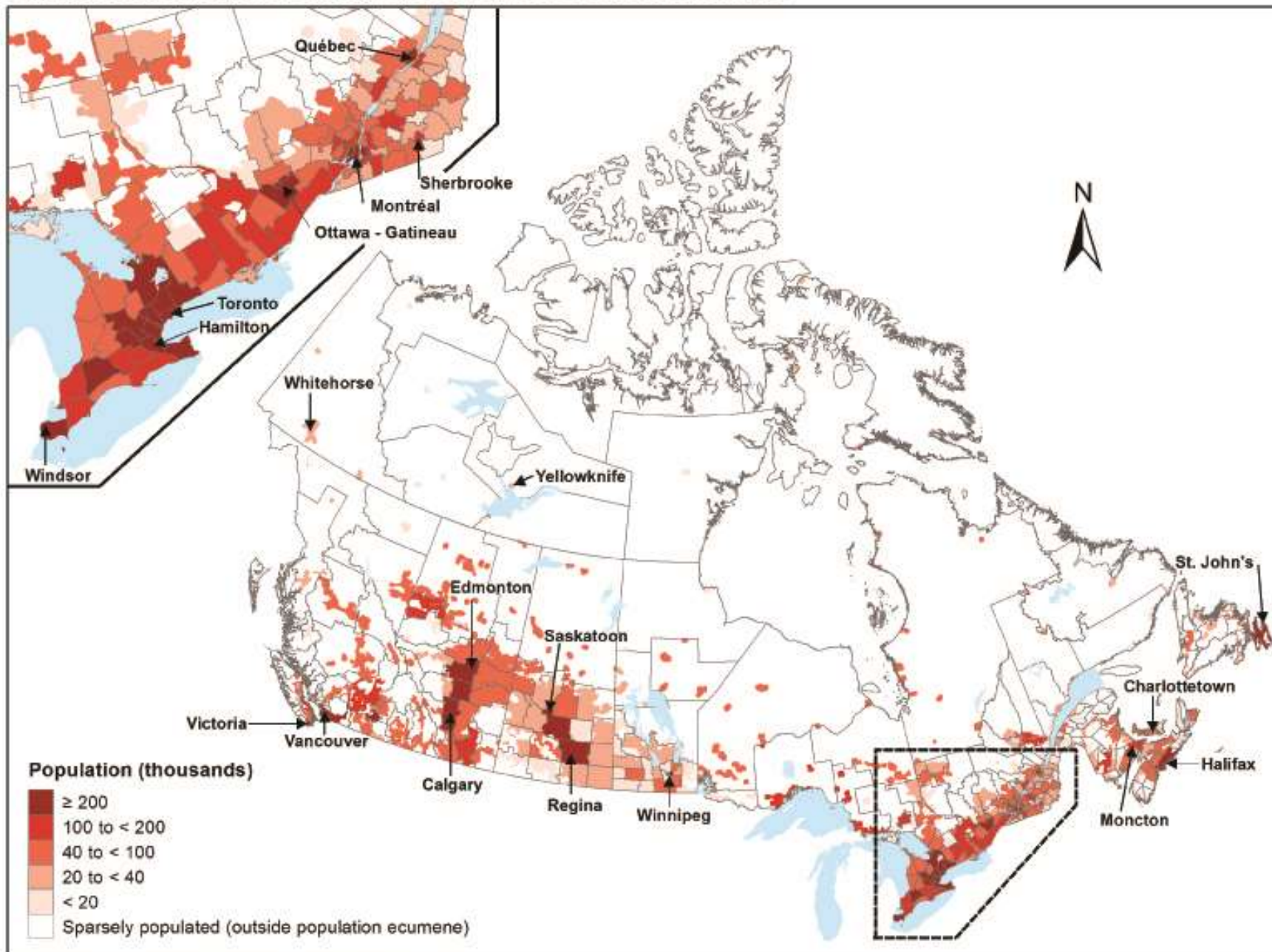


Province	# Coastal Municipalities
BC	72
MB	1
NB	40
NL	233
NT	4
NS	39
Nunavut	24
ON	1
PEI	45
QC	116
CANADA	575



Map 4.1

Population distribution as of July 1, 2017, by census division, Canada



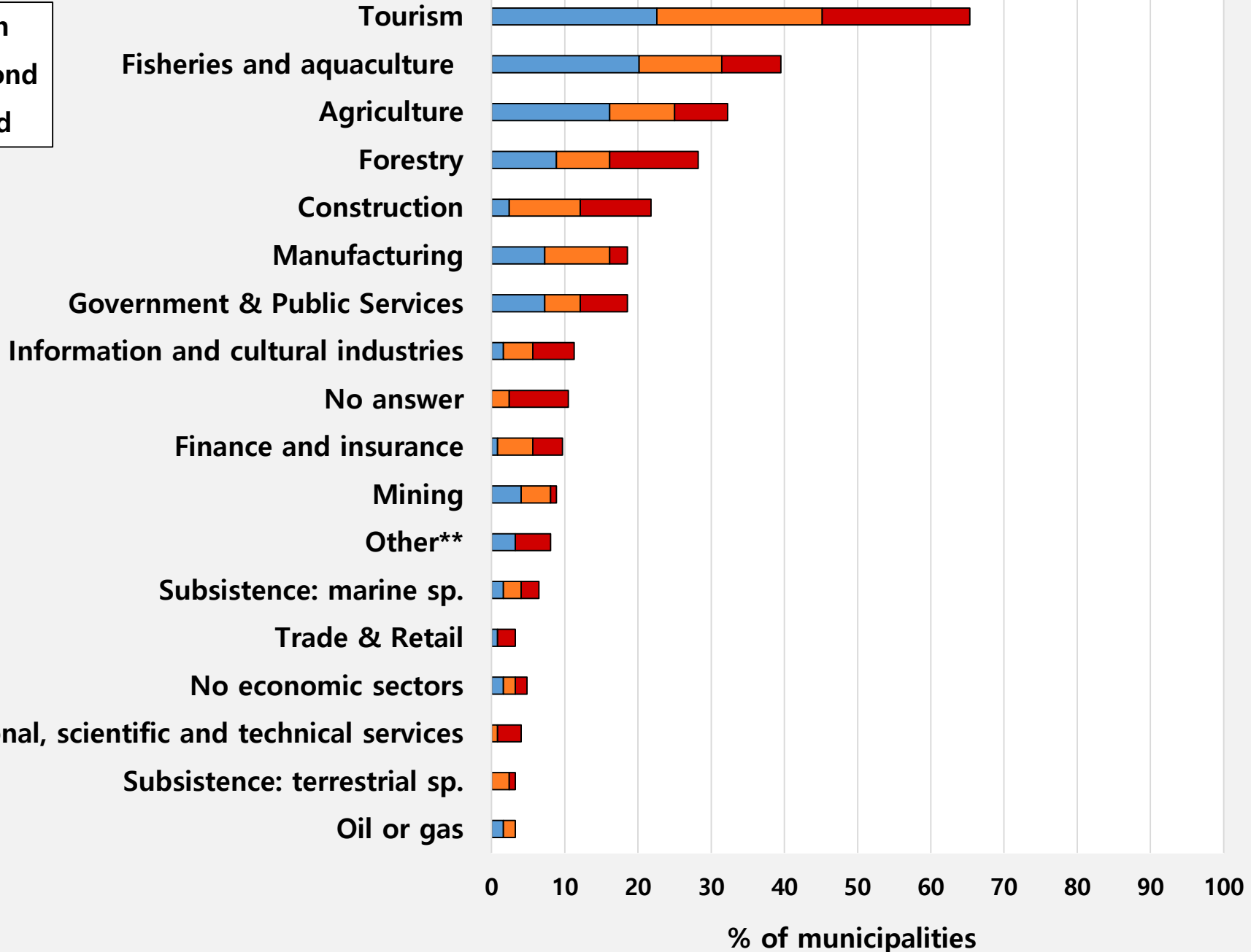
Source: Statistics Canada, Demography Division.



Responses by Province

Province	# of completed	Response rate
BC	21	29.17
MB	0	0
NB	12	30
NL	14	6.01
NT	0	0.0
NS	18	46.15
Nunavut	1	4.17
ON	0	0
PEI	9	20
QC	33	28.45
All of Canada	108	18.78%

Municipalities' Top 3 Economic Sectors

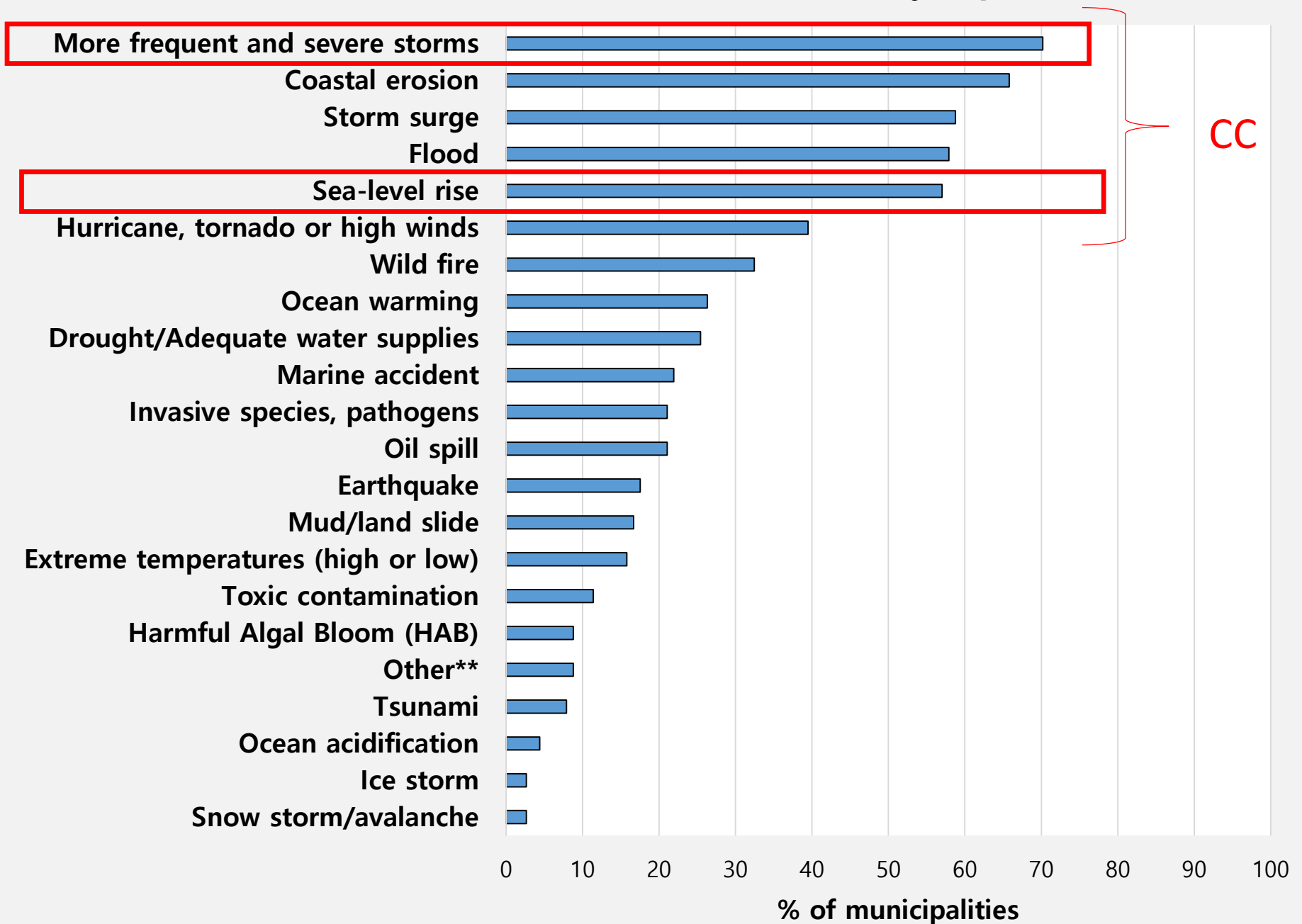




Canadian Coastal Communities:

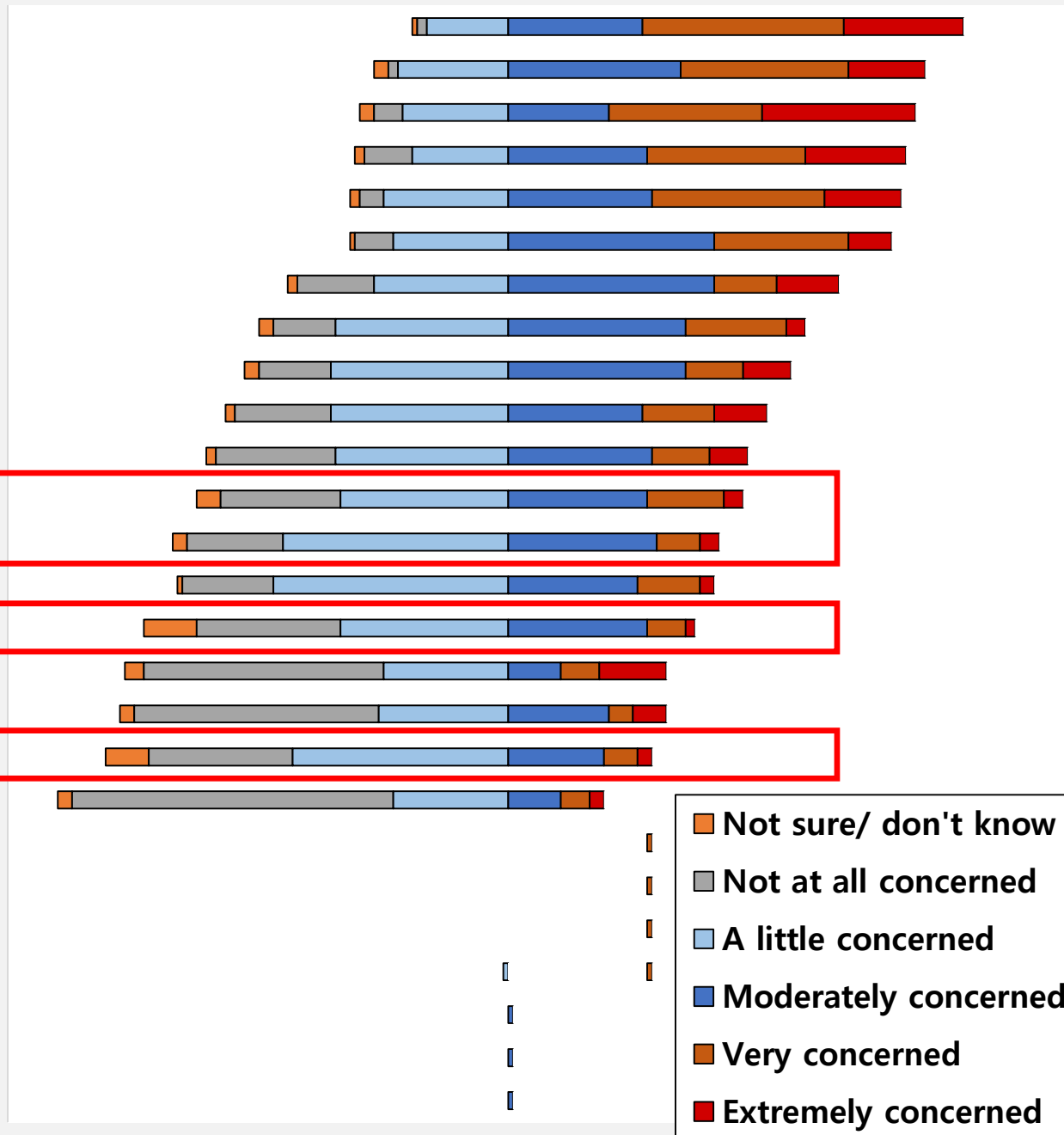
**Which Hazards Are
Relevant to Them?**

Hazards: Currently Experienced

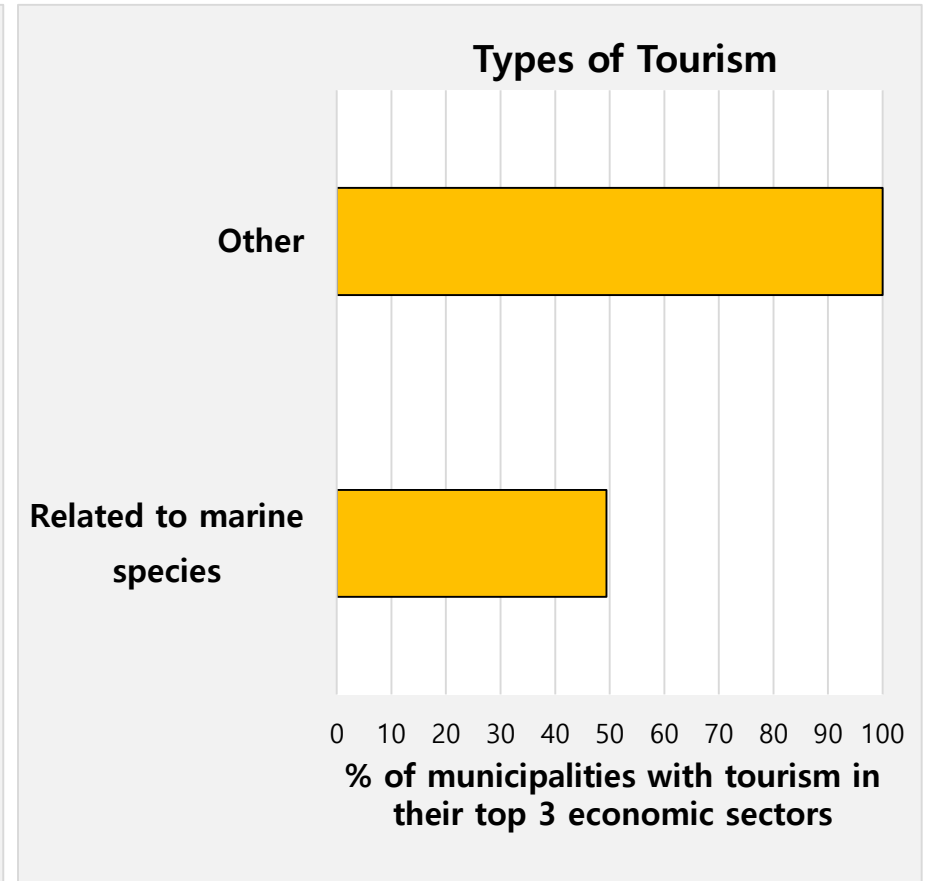
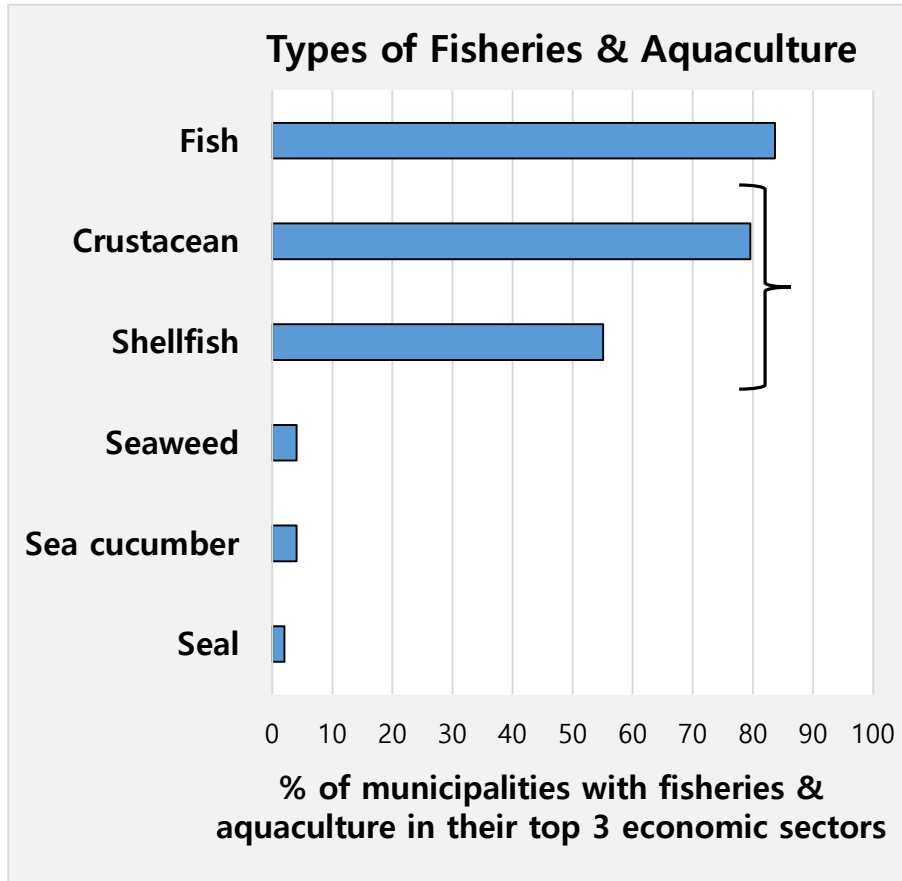


Hazards: Municipalities' Level of Concern

- More frequent and severe storms
- Sea-level rise
- Coastal erosion
- Flood
- Storm surge
- Hurricane, tornado or high winds
- Wild fire
- Ocean warming
- Oil spill
- Drought/Adequate water supplies
- Marine accident
- Invasive species, pathogens
- Toxic contamination
- Extreme temperatures
- Ocean acidification
- Earthquake
- Mud/land slide
- Harmful Algal Bloom (HAB)
- Tsunami
- Debris flow
- High groundwater levels
- Civil unrest
- Ice storm
- Infrastructure failure
- Air quality
- Snow storm/avalanche



Vulnerability



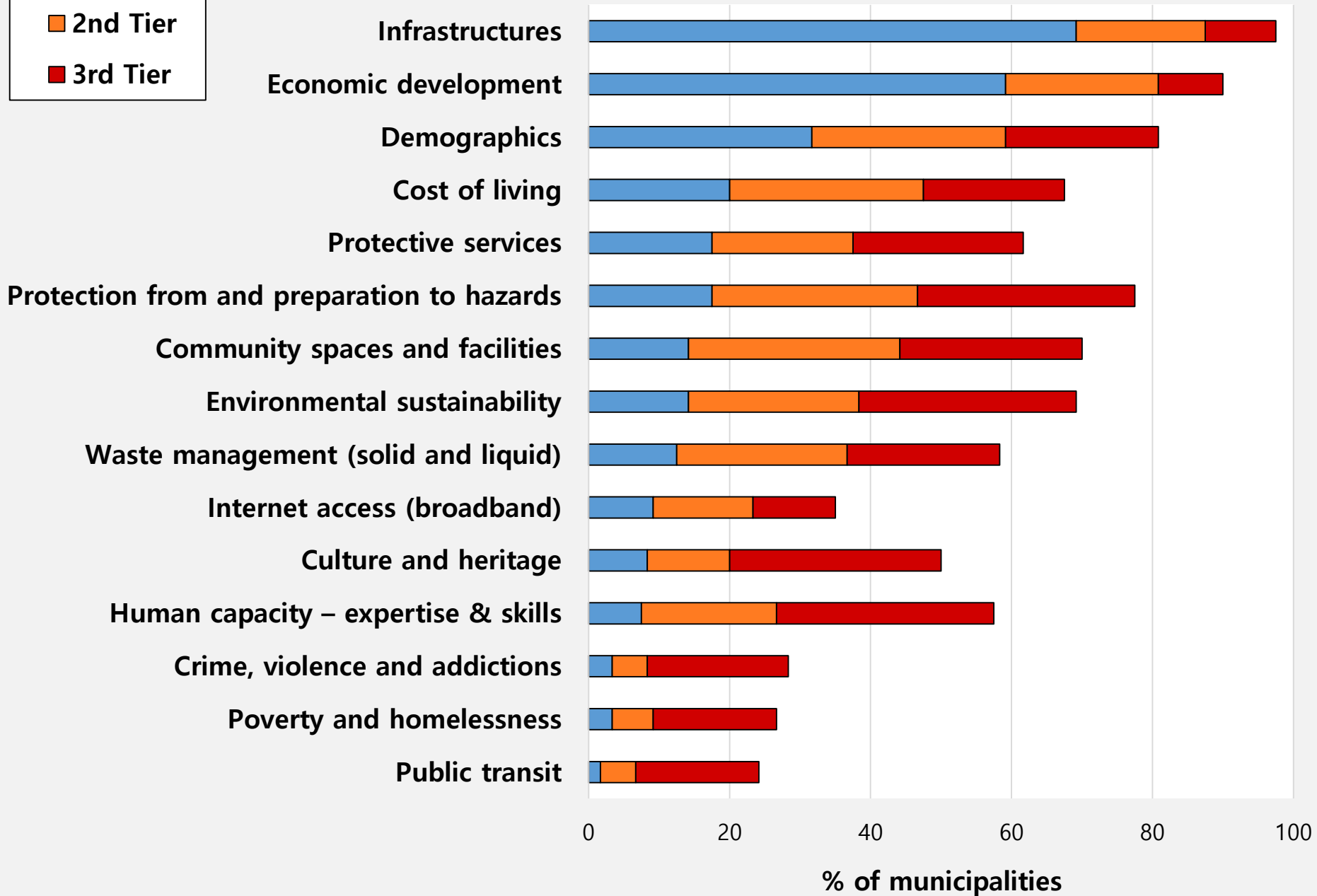
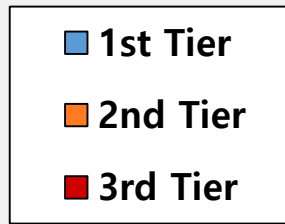
- 81.63% of fishing municipalities harvest shellfish and/or crustaceans
- Nearly 50% of coastal tourism is related to marine species



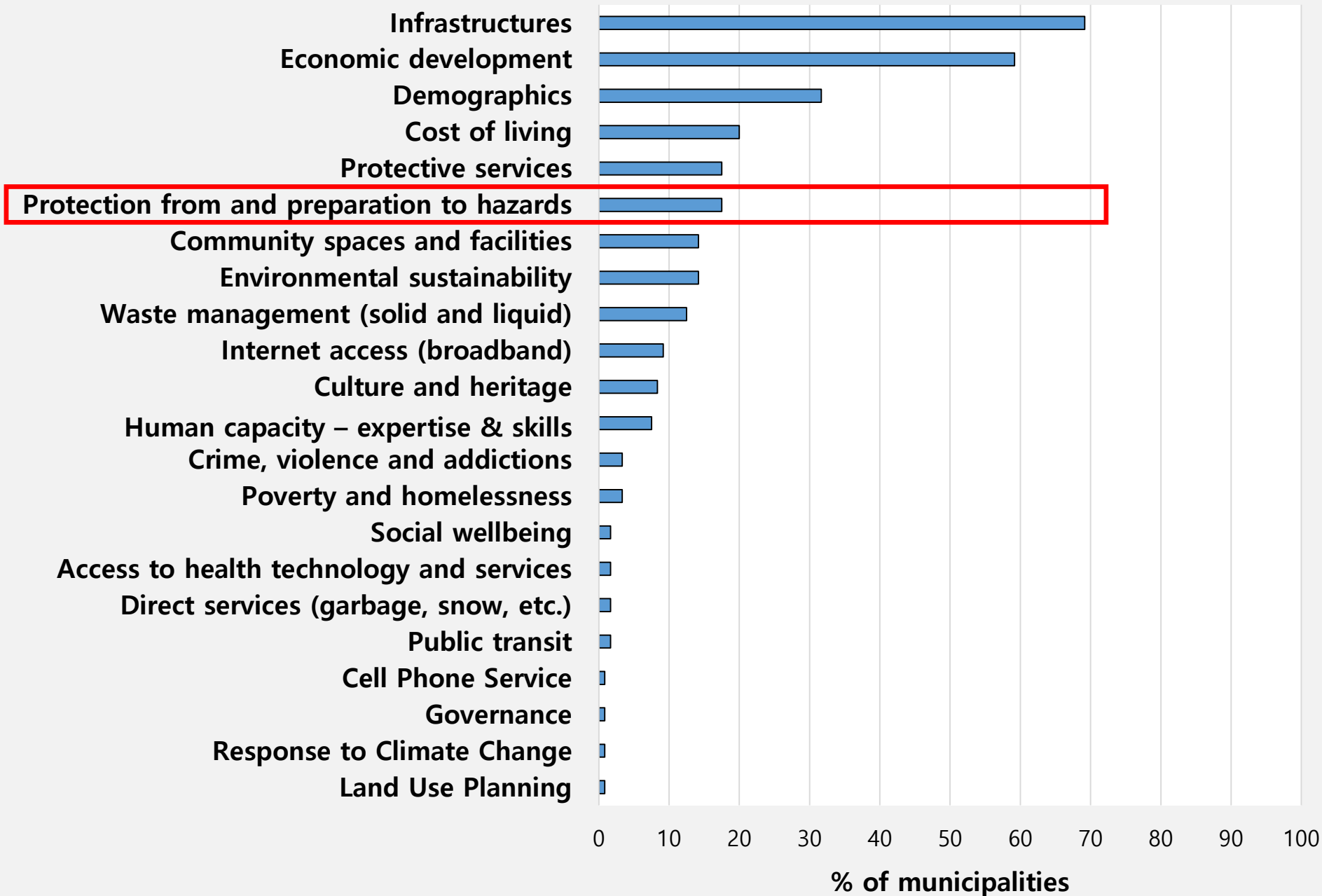
Canadian Coastal Communities:

What Are Their
Priorities? What Do
They Care About?

Municipalities' Top 10 Priorities

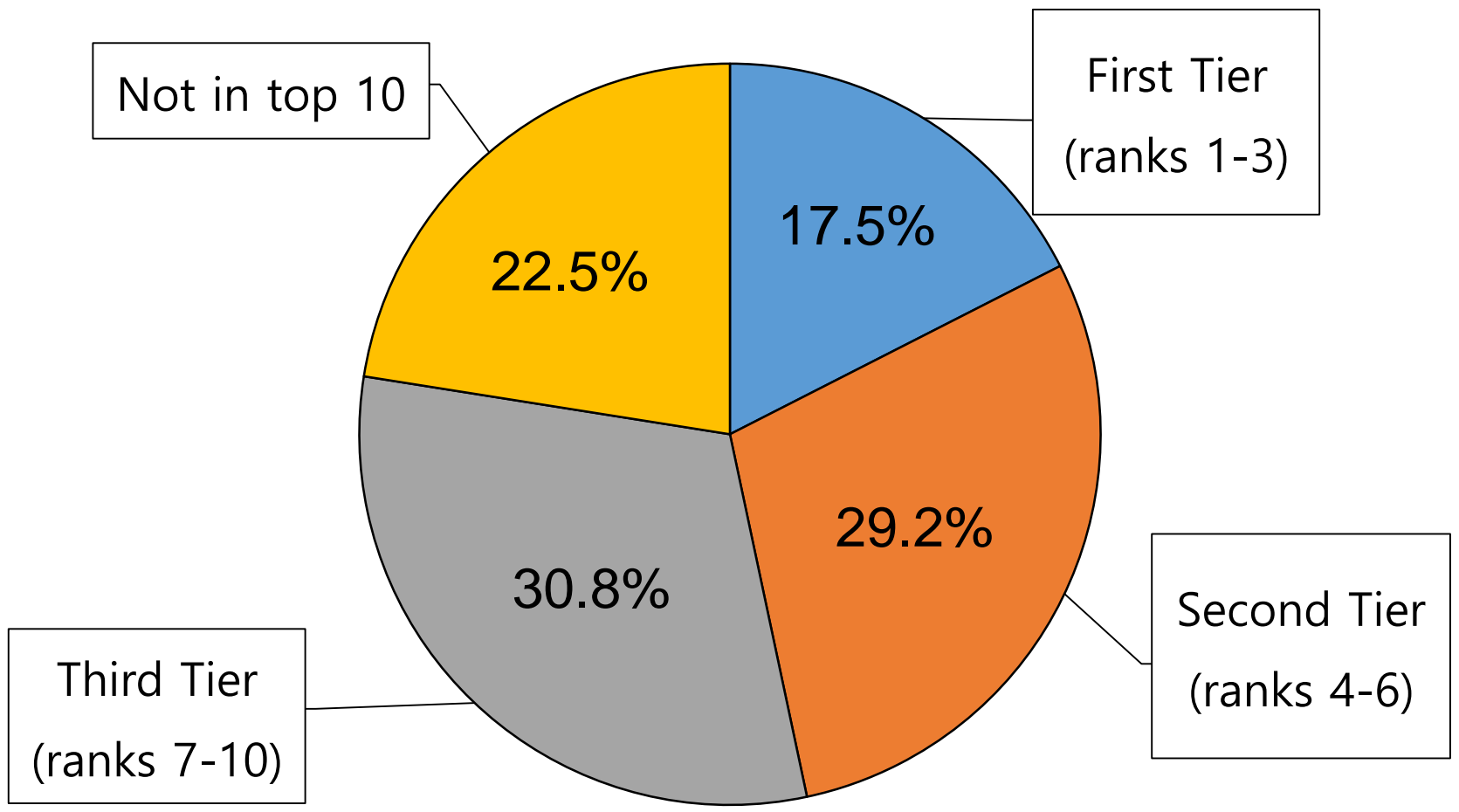


Municipalities' Top 3 Priorities





Protection from & Preparation to Hazards: Rank among Municipalities' Priorities





What People Value: What Makes Life Enjoyable and Should be Protected?

- Clare, NS

- Top priorities:

- Livelihoods (jobs, income, avoiding bankruptcies)
 - Sociocultural activities (e.g. clamming)
 - Ensuring the continuity of fishing as a way of life and for cultural reasons (rather than economic)

- When aggregating:

- Material wellbeing
 - Identity & culture/
Quality of life
 - Community composition
& structure





What People Value: What Makes Life Enjoyable and Should be Protected?

- Tofino, BC

- Top priorities:

- Protection of the environment (ocean, coast, landscapes)
- Livelihood (e.g. jobs) & food security
- Avoiding severe conflict/violence (e.g. civil unrest)

- When aggregating:

- Environment: quality of life, source of resilience & livelihoods
- Material wellbeing
- Human relations and identity & culture
- Community composition & structure

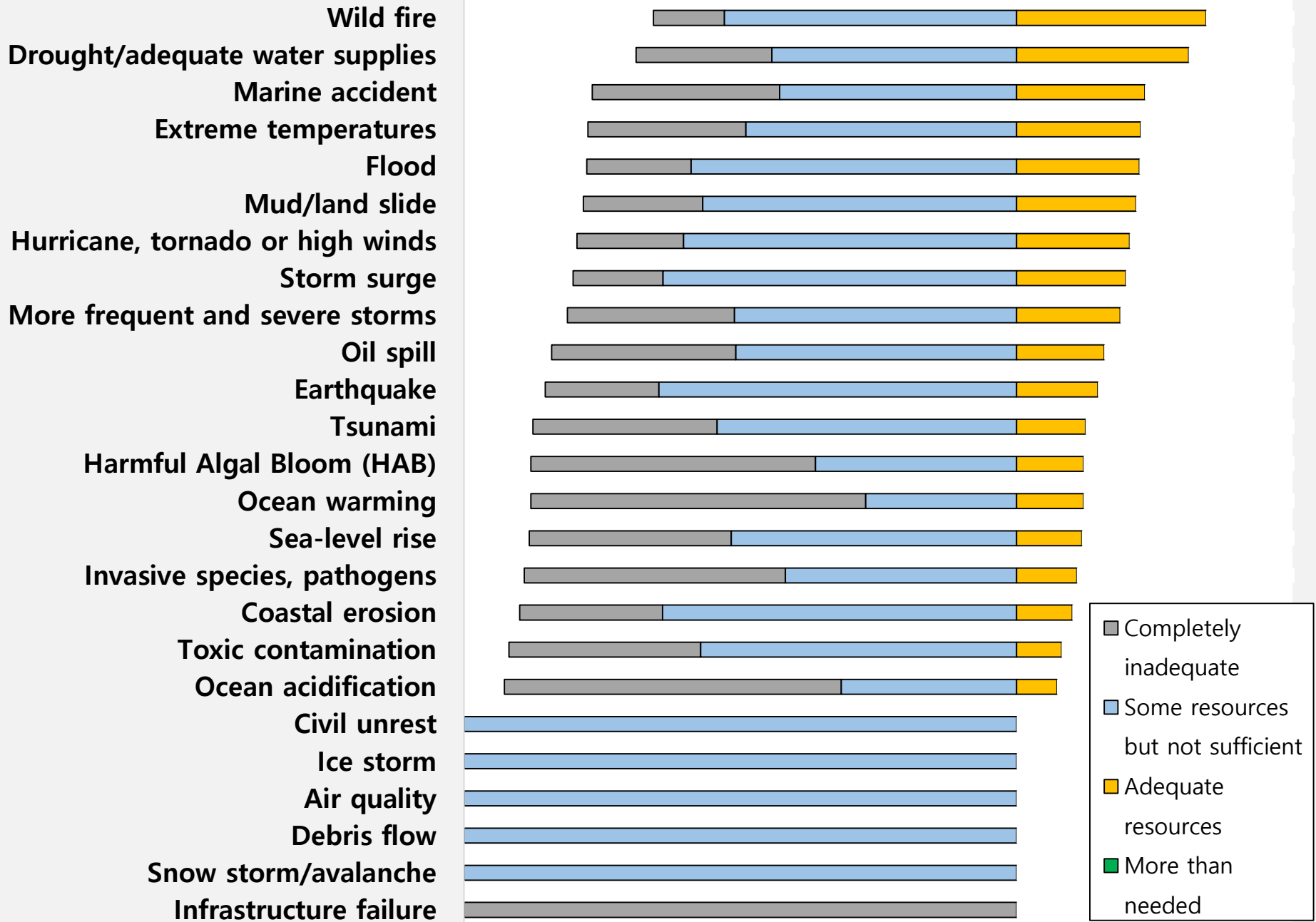




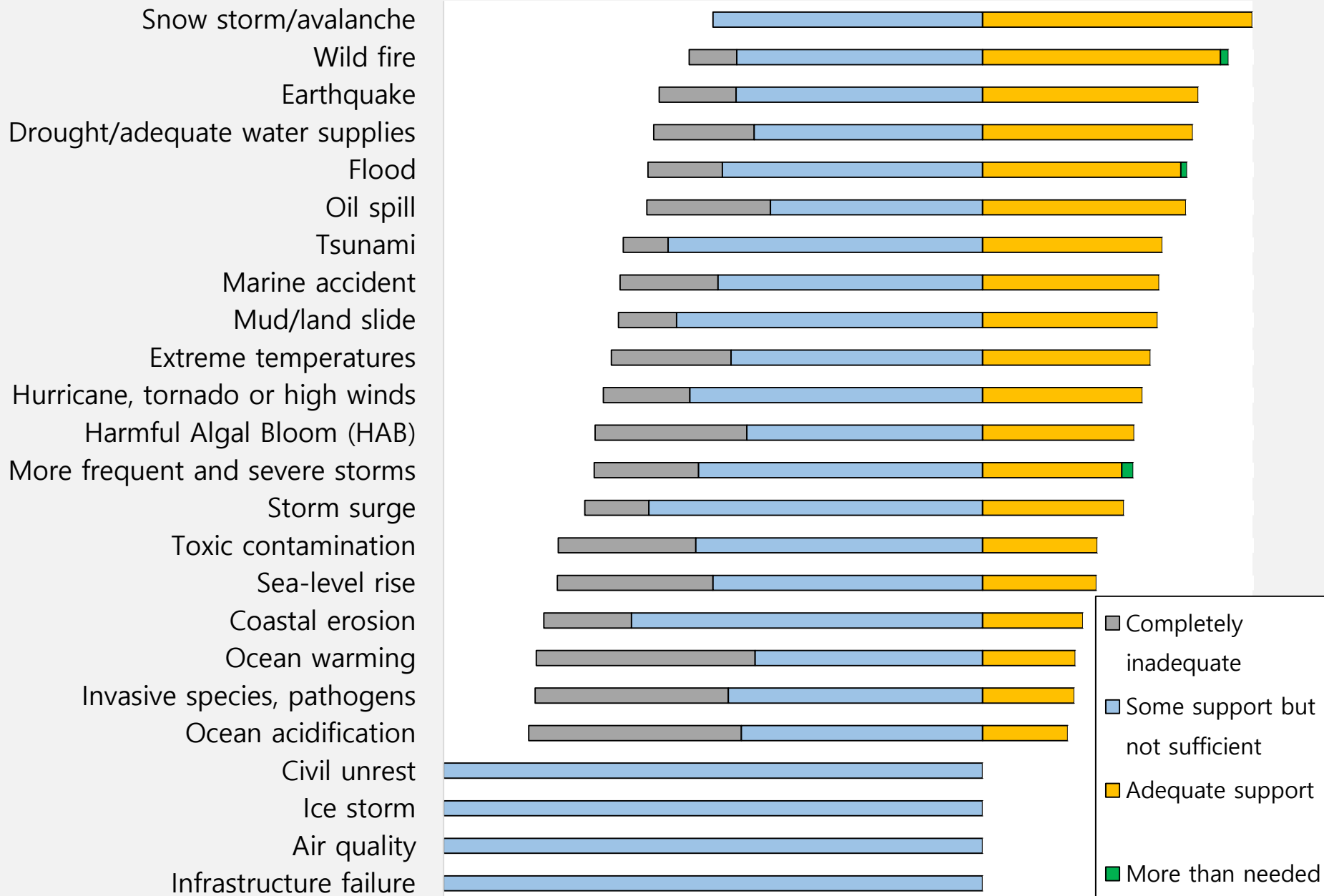
Canadian Coastal Communities:

Do They Have Access to
the Resources and
Support They Need?

Municipalities' Access to Resources to Address Relevant Hazards



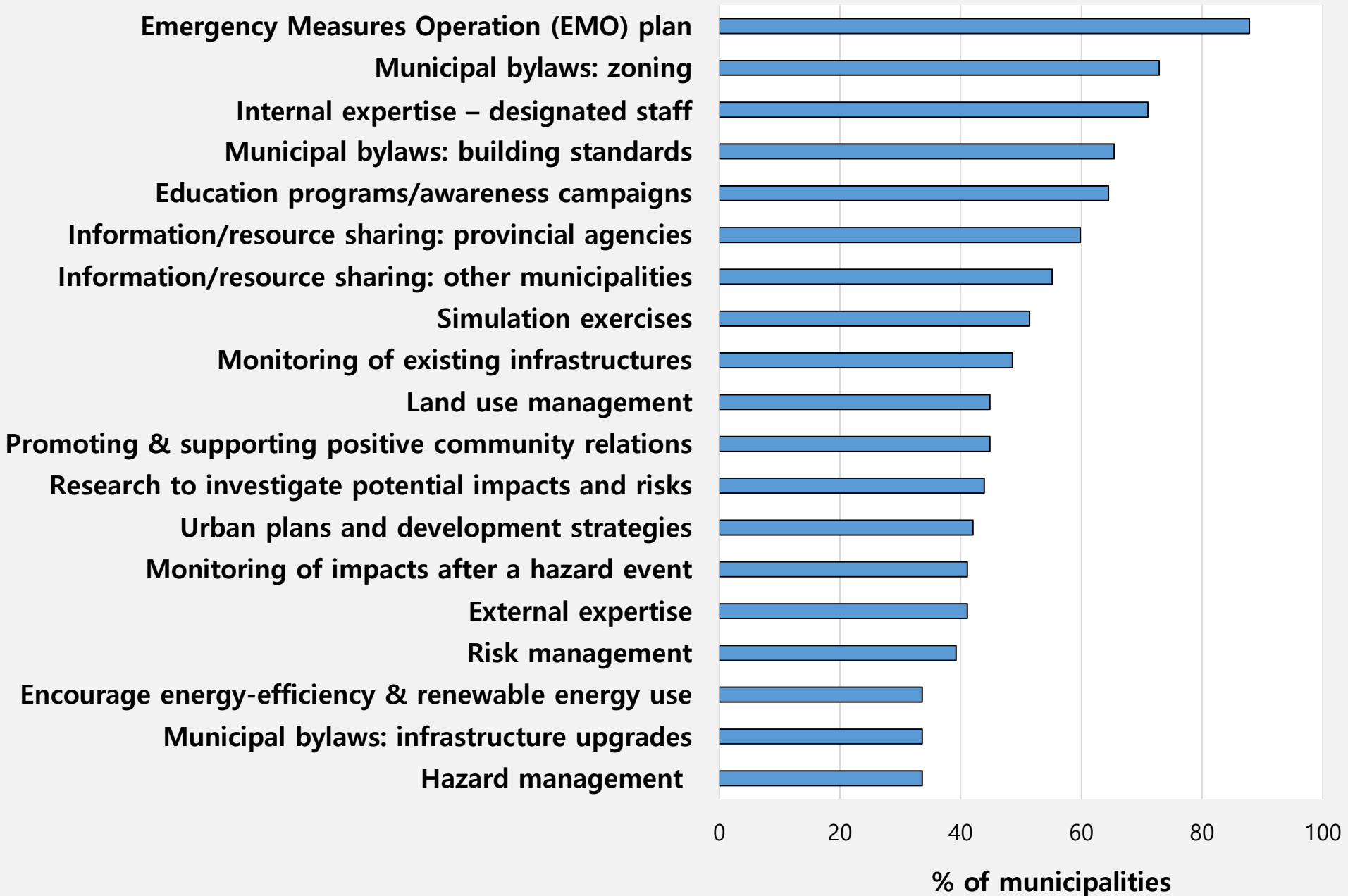
Municipalities' Access to External Support to Address Relevant Hazards





Canadian Coastal Communities:
What Are They Doing?

Municipalities Responses to Hazards (for >33.3% of respondents)



Types of Community Responses



Individual & material wellbeing

- *Food & shelter*
- *Money*
- *Livelihood adaptations*

Relational wellbeing

- *Community interactions*
- *Migration*
- *Relocation*

Guidance

- *Governance*
- *Management*
- *Planning*

Awareness

- *Data & Information*
- *Knowledge*
- *Learning*

Infrastructure

- *Green Protection*
- *Hard Protection*



Responses by Type

Category	% Municipalities
Guidance & governance	95.33%
Awareness	93.46%
Relational wellbeing	49.53%
Infrastructure	43%



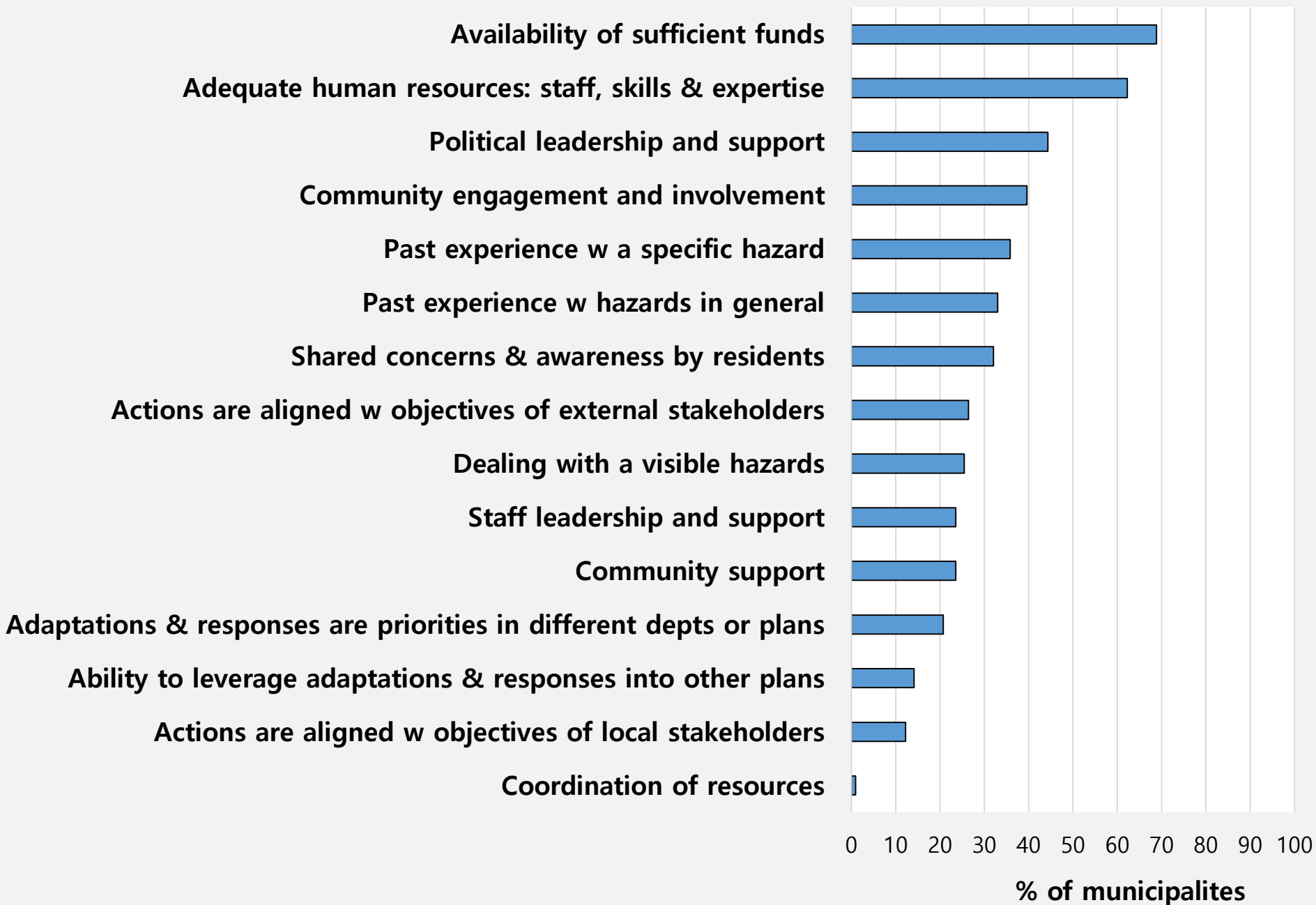
Canadian Coastal Communities:

**What Are the Barriers &
Facilitators to Hazard
Responses?**

5 Greatest Barriers for Devising, Planning and Implementing Hazard Responses



5 Greatest Facilitators for Devising, Planning and Implementing Hazard Responses





Key Points

Municipalities:

- Are aware of hazards and interested in implementing responses
- Are already engaging in a wide variety of responses
 - Mostly focused on awareness and governance
 - Relational wellbeing might be an area to explore
- Need more resources and support in order to address municipal priorities and adequately protect what people value (broader objectives than EM & DRR)



Acknowledgements

A big thank you to:

- Municipality of Clare, NS: Mark Doucet, Stéphane Cyr, Alain Poirier, Pamela Doucet
- Municipality of Tofino, BC: Keith Orchiston, Josie Osborne
- Hubert Saulnier
- Laura Loucks
- Greg Zwicker
- Dufferin Research



More to Come...

- By province
- By designation
- By population size
- Relevant hazards and level of concern
- Departments involved in hazard responses



Recruitment

- Contact List
 - Assistance from:
 - Provincial associations of municipalities
 - Provincial government staff
- Pre-launch Announcement
 - Newsletters
- Email invitation
 - Mostly CAOs
 - EMC and planners when available info
 - Follow-up phone call (ongoing)