STAFF REPORT TO COUNCIL

Council Meeting: FEBRUARY 20, 2019
500 Matterson Drive, Ucluelet, BC V0R 3A0

FROM: JOHN TOWGOOD, PLANNER 1 **FILE NO:** 5280-16

SUBJECT: DISTRICT OF UCLUELET FLOOD MAPPING PROJECT **REPORT NO:** 19-17

ATTACHMENT(S): APPENDIX A – GRANT GUIDE AND PROPOSED APPLICATION

RECOMMENDATION(S):

1. **THAT** Council fully supports the District of Ucluelet Flood Mapping Project and directs Staff to allocate time for the overall project including grant management, public engagement and communication.

PURPOSE:

The purpose of this report is for Council to authorize the Manager of Community Planning to proceed with the funding application for the Ucluelet Flood Mapping project to the *Community Emergency Preparedness Fund* through UBCM, and commit the District's in-kind resources (mostly staff time). As part of the application process it is required that Council indicate support for the project and that it will direct Staff to dedicate the appropriate time to provide overall grant and project management.

DISCUSSION:

A detailed project description is included in the draft grant application attached in Appendix A. Briefly, the purpose of the project is to engage a qualified engineering consultant experienced in coastal engineering to develop a flood risk assessment, prepare flood plain mapping, establish flood construction levels, identify sea level rise planning areas and identify flood hazards for the development and refinement of future land use policy in Ucluelet. The 2019 Community Emergency Preparedness Fund grant is an excellent opportunity to harness the resources necessary to complete this specialized work. It is not certain whether similar funding will be available in future years, so staff are strongly supportive of completing this work now. Some adjustment of work plans may be necessary, but with the additional resources being added to the Fire and Emergency Services department we are confident that the project will be a success.

TIME REQUIREMENTS – STAFF & ELECTED OFFICIALS:

Staff have already spent the time to complete the grant application by the submission deadline of February 22, 2019. If the application is successful, the Manager of Community Planning or designate will head/liaise on the project. A provincial response on funding decisions is expected within 90 days.

Moderate staff time will be required to manage this project and its required public engagement and reporting to the funding agency. The main participation will be in the Community Planning and Emergency Services departments. The grant requires that the project be completed within one year of approval.

FINANCIAL IMPACTS:

This grant available for the project is 100% of eligible expenses up to a maximum of $150,000. The District's commitment is for the equivalent of $15,000 in-kind contribution of resources including staff time, meeting space for public engagement activities, etc. The project would not proceed at this time without external funding.

OPTIONS REVIEW:

1. **THAT** Council fully supports the District of Ucluelet Flood Mapping Project and directs Staff to allocate time for the overall project including grant management, public engagement and communication.
   (Recommended)

2. THAT Council not support this grant application.

Respectfully submitted: John Towgood, Planner 1
Bruce Greig, Manager of Community Planning
Mark Boysen, Chief Administration Officer

UBCM

Community Emergency Preparedness Fund

Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning

2019 Application Form

Please complete and return the application form by **February 22, 2019**. All questions are required to be answered by typing directly in this form. If you have any questions, contact cepf@ubcm.ca or (250) 387-4470.

SECTION 1: Applicant Information	**AP** *(for administrative use only)*
Applicant: District of Ucluelet	Date of Application: February 21, 2019
Contact Person*: Bruce Greig	Position: Manager of Planning
Phone: 250 726 7744	E-mail: bgreig@ucluelet.ca

* Contact person must be an authorized representative of the applicant.

SECTION 2: Project Summary

1. **Name of the Project**:

   District of Ucluelet Flood Mapping Project

2. **Type of Project.** Please identify each component you are applying for:

   ☒ Flood Risk Assessment

   ☒ Flood Mapping

   ☐ Flood Mitigation Planning

3. **Project Cost & Grant Request:**

   Total Project Cost: $165,000.00 Total Grant Request: $150,000.00

   Have you applied for or received funding for this project from other sources (i.e. National Disaster Mitigation Program or Gas Tax)?

   No

4. **Project Summary**. Please provide a summary of your project in 150 words or less.

   The District of Ucluelet, being surrounded on three sides by the Pacific Ocean and its proximity to the Cascadia subduction zone, is a community that is acutely affected by the incremental and sudden changes to ocean conditions like storm surges, king tides, storm waves, climate change, sea level rise, and coastal erosion. The purpose of the “District of Ucluelet Flood Mapping

Project" is to engage a qualified professional engineering consultant experienced in coastal engineering to develop a flood risk assessment, flood plain mapping, establish a flood construction level (FCL), identify sea level rise planning areas, and identify flood hazards for the development of future land use policy.

SECTION 3: Detailed Project Information

5. Project Area. Describe the proposed project area (location, size, population, land use, etc.).

Map indicating the location of the proposed project must be included with this application.

The District of Ucluelet is located on the west coast of Vancouver Island at the southerly most end of the Ucluth Peninsula. The village is surrounded by ocean on three sides. To the west is the Pacific Ocean and the Cascadia Subduction zone fault line. To the east is the First Nations community of Hitacu located across the Ucluelet inlet. This inlet contains extensive harbour facilities and sensitive ecologically areas. To the north is the Long Beach unit of Pacific Rim National Park Resreve, the First Nations Community of Esowista, and the community of Tofino located further north at the tip of the Esowista Peninsula. To the south is Barkley Sound and the Broken Group Islands also within the Pacific Rim National Park Reserve.

Geologically, the town-site of Ucluelet is situated on a rocky section of the peninsula. However, many areas are also comprised of pleistocene sediments, including sand and other unstable materials. Approximately 57% of the District is located below 20m above datum which is consider in the District of Ucluelet's emergency plan as our community's Tsunami inundation zone.

Ucluelet has a population of 1717 people (Census, 2016), but during summer seasons the visitor population brings the overall population to approximately 3,000 to 5,000 people. This larger population is now becoming the norm for winter months as Ucluelet develops as a winter surf and storm watching destination.

6. Proposed Activities.

a. What <u>specific</u> activities will be undertaken as part of the proposed project? Please refer to Section 4 of the Program & Application Guide for eligibility and note that activities must align with the required workplan and budget.

1. Define the Designated Storm(s) and the associated winds and storm surge.

2. Determine a flood risk assessment and the Designated Flood Level, considering sea level rise, tide conditions, and storm surge.

3. Characterize the incident wave climate approaching the shoreline.

4. Determine Wave affects and overtopping rates at the shoreline.

5. Calculate the Flood Construction Levels.

6. Determine the location and quantity of structures, people, and assets that might be affected in the District of Ucluelet.

7. Written report capturing the above described deliverables with identification of concerns for data quality, data gaps and assumptions for all these models. The report should also include steps to address these issues on a next phase of the project.

8. Delivery of the information to the community by the team running the models at a public and expert level of information during a workshop where public and managers questions can be addressed.

9. Update District of Ucluelet polices and bylaws such as the Official Community Plan and Zoning Bylaw; create new policies and/or bylaws such as a Flood Control Bylaw utilizing flood mapping and data; and complete a National Disaster Mitigation Plan Risk Assessment Information Template (RAIT) with the new data (the timing of the two projects are such that they may run concurrently).

b. List any potential implementation risks that may impact the ability to deliver on the project, and explain what mitigation measures are in place to address them (e.g. staff capacity, procurement, etc.).

We don't anticipate any major risks to the implementation of this project.

7. Rationale. What is the rationale and evidence for undertaking this project? This may include local flood hazard and/or seismic vulnerability as identified in the Emergency Plan or flood mapping, threat levels identified in completed flood risk assessments and/or recent flood history (e.g. evacuation order and/or disaster financial assistance).

Copies of any relevant documents that support the rationale for this project must be included with this application.

Ucluelet's coastline is vulnerable to the impacts of storm surges, high tides, and waves; climate change, sea level rise and coastal erosion; and subsidence, soil liquefaction, and tsunamis. Mapping areas at risk from coastal flooding could help identify areas and coastal conditions of concern for all residents and visitors to the District of Ucluelet, as well as contribute to planning, design and mitigation efforts to minimize impacts.

On October 14, 2016 an HF Radar system operated by Ocean Networks Canada in Ucluelet triggered automatic alerts when it detected a tsunami (Dzvonkovskaya et al, 2017). As a precaution and independent of the alert to Ocean Networks Canada, the local authorities in Ucluelet, Tofino and the Pacific Rim National Park closed all beaches on the Esowista Peninsula. This event was caused by the remnants of Typhoon Songda approaching BC from the Pacific. The data from tidal buoys from the Canadian Hydrographic Service and meteorological information from Weather Canada confirmed this event as a combination of multiple tsunami waves of meteorological origin, together with other hazardous waves (seiches and infragravity waves) and about 60cm of storm surge (Rabinovich et al., 2017). The currents generated by theses events are a serious hazard for navigation and these tsunami waves can affect coastal regions in a destructive way. The detection of this event (Guerin et al. 2017, Dzvonkoskaya et al. 2017), indicates the high risk of hazardous waves and storm surge in Ucluelet. The currents generated by these events are a serious hazard for navigation and the tsunami waves observed can affect coastal regions in a destructive way.

Again, on October 19, 2017, hazardous waves, high tides, and storm surge forced the closure of all beaches on the Esowista Peninsula (from Ucluelet to Tofino). These conditions resulted in flooded beaches, floating logs, large waves breaking high up on shore and extremely hazardous surf conditions.

Modelling and mapping is required to better understand these hazardous coastal processes and the joint probability of all of the processes occurring at the same time. This mapping project will help to establish quantitative criteria for the restriction or closure of public beaches due to hazardous coastal flooding conditions. The District of Ucluelet has many residences and resorts adjacent to its outer coast and inlet areas. Currently the District of Ucluelet Zoning Bylaw No. 1160, 2013 contains regulations requiring buildings to be 15 m away from the natural boundary of the sea. There is currently no regulation within the Ucluelet's Zoning Bylaw to regulate the flood construction level for buildings. The District of Ucluelet wishes to utilize the flood mapping data to comply with best practices including accounting for climate change and local conditions.

The District of Ucluelet is also at risk from both earthquakes and tsunamis. Traditional knowledge from coastal First Nations and sediment records indicate the recurrence of earthquake and tsunami events in this area. Due to natural erosion processes, there are only deposits from 3 tsunamis in the Ucluelet area: the Alaska 1964 tsunami, the Cascadia 1700 event and a tsunami from an unknown source between 500-800 years ago (Clague and Bobrowsky 1994a, b). The probability of a damaging tsunami with more than 1.5m run-up in the West Coast of Vancouver Island is between 40-80% for the next 50 years (Leonard et al, 2013). Ucluelet has activated it's Emergency Operation Center on a number of occasion in recent years, all in response to distant and regional tsunami alerts. The community's proximity to the Cascadia Subduction Zone leaves it vulnerable to notifying both residents and tourists in the event of a locally generated Tsunami.

Current protocol is to move to high ground if shaking is felt and not to wait for an official warning. A safe planning level has been designated to be above 20 metres, however, preliminary tsunami modelling and mapping is required to confirm this, identify high ground (safe areas), and help in determining the most effective evacuation routes. In the case of a significant earthquake from the Cascadia subduction zone, Ucluelet could suffer strong subsidence making it more susceptible to the tsunami. The permanent inundation after the event of subsided areas should also be considered as a long-term issue related to sea-level rise (SLR). The scientific literature based on numerical models and sediment records indicates that such subsidence would rapidly elevate the sea-level 30 to 200 cm on the west coast of Vancouver Island (Thomson et al, 2008). Rates of SLR for BC have been estimated at a 1m rise between 2000 and 2100 and a further 1m by the year 2200 (Ausenco Sandwell 2011a), but further adjustments to SLR are required in Ucluelet to account for uplift and subsidence of the land surface.

8. Engagement & Collaboration

a. Describe how the proposed project will contribute to a comprehensive, cooperative and regional approach to flood planning.

The District of Ucluelet is looking at the risks from coastal flooding from a comprehensive perspective including; emergency planning, community sustainability, land use planning, engineering and management of infrastructure assets, and public policy.

Historicallt, the District of Ucluelet and the communities within the west coast region (see s. 8 below) have worked together and consulted each other on a range of important issues; this project would be an important continuation of that cooperative spirit.

We plan to share our experience and the information collected to increase our region's collective knowledge on coastal flooding. As flood mapping is completed for the peninsula’s entire coastline, we anticipate that the region will work together to develop a unified approach to mitigate the risks associated with coastal flooding. This work builds on the spirit of mutual community assitance as evidenced by protocols for mutual aid between the Ucluelet Volunteer Fire Brigade (UVFB) and Tofino Volunteer Fire Department, and servicing agreements which extend the UVFB area of response to the Yuułuʔiɬʔatḥ village of Hitacu and the unincorporated areas of the Alberni Clayoquot Regional District which together comprise the eastern side of the Ucluelet Inlet.

b. List current and potential stakeholders and partnerships, and describe their level of engagement and commitment to the project.

The potential stakeholders for our region are; Yuułuʔiɬʔatḥ Govenrment (YFN), the Tla-o-qui-aht First Nation (TFN), the Toquaht First Nation, the Pacific Rim National Park Reserve, the Alberni Clayoquot Reginal District (ACRD) and the District of Tofino (DoT)

The TFN, the ACRD the Toquaht Nation and the DoT are all engaged in pursuing flood mapping and climate adaption. If the District of Ucluelet is successful with this grant the project will provide one part of a regional solution. The project area includes land within the

ACRD and the YFN, and this project will support work these entities pursue toward flood mapping and climate change adaption. The District of Ucluelet will engage with all partners and support their efforts towards flood assessment and mitigation. Tofino and TFN are actively creating flood mapping and it is hoped that the Pacific Rim National Park Reserve will also complete flood mapping so that collectively the west coast region can plan coordinated approaches and solutions. Regional stakeholders will be invited to be information-sharing participants in the Ucluelet Flood Mapping project, but are not expected to contribute funding support for this project.

9. Proposed Deliverables & Outcomes

a. What specific deliverables will result from this project?

The specific deliverable for the District of Ucluelet Flood Mapping Project is to engage a qualified professional engineer consultant experienced in coastal engineering to develop a flood risk assessment, flood plain mapping, establish Flood Construction Levels (FCL), identify sea level rise planning areas, and identify flood hazards for the development of future land use policy.

b. Describe how the proposed project considers climate change in the project methodology and mitigates the impacts of climate change through the final deliverables.

The District of Ucluelet has many residences and resorts adjacent to its outer coast and inlet areas. Currently the District of Ucluelet Zoning Bylaw No. 1160, 2013 contains regulations requiring buildings to be 15 m away from the natural boundary of the sea and there are currently no regulations within the Ucluelet's Zoning Bylaw to regulate the elevation or flood construction level for buildings. Based on the findings of this project and its final delverables, the current bylaws and policies will be updated.

c. To what extent will the proposed project increase understanding of the social and economic impacts of flood events to the community?

The proposed flood mapping is meant to serve as a communication piece with the community to increase understanding of the social and economic impact of flood events. The community is becoming more educated on tsunami risks thanks to increased efforts of the District of Ucluelet staff and its Emergency Network through events such as Community Shakeout events and stakeholder meetings. A component that requires further attention is the understanding of risks associated with increases to sea level rise and instances of storm surge, and the impacts of climate change. The project includes two public consultation components: one to gather community input at the data collection stage and another to review the results of the mapping project. The project also includes presentations to District of Ucluelet Council in a public meeting setting. Future consultation opportunities will also arise from having this data available once the District proceeds with utilizing the information to update/ create polices and bylaws surrounding flood hazards.

d. How does the project align with other work by your local authority in meeting Provincial Flood Hazard Area Land Use Management Guidelines, including existing or future amendments to local plans, policies, building codes, floodplain zoning bylaws, and/or public awareness/education?

The guidelines have recently been updated by the Province predicting significant sea level rise for coastal communities, and the District of Ucluelet wishes to utilize the flood mapping data to comply with best practices including accounting for climate change and local conditions. The data can then feed into updated policy and bylaws with the purpose to mitigate risk to vulnerable properties by possibly establishing future no build areas, flood construction levels that account for future sea level rise, and future growth areas located out of current and future hazardous areas. The draft Ucluelet Official Community Plan (OCP) introduces new Development Permit (DP) Area regulations for hazardous conditions

	including shoreline areas that may be subject to flooding. The draft DP area mapping is considered a placeholder until proper flood risk mapping and detailed FCL data is available. The draft OCP points to ongoing improvement of local mitigation strategies, explicitly pointing to future bylaw amendments to incorporate better shoreline data as it becomes available; this grant application is a citical opportunity for the District to harness the necessary capacity to improve community preparedness for flood emergencies.
10.	**Monitoring & Performance Measures.** Describe how the project will be monitored and what performance measurements will be used (e.g. work progress reports, timeline review, resource planning, procurement plan and roll out, etc.). 1. Proposal evaluation criteria and evaluation procedures have been developed for the procurement process. 2. A contingency fund of 15% will be allocated for the project. 3. Project milestones will be developed to ensure deliverables are being met on time/schedule. 4. The RFP will include a summary of the proponent's understanding of the work, methodology and work plan, project team and resumes, relevant project experience, budget table, and proposed schedule for the work. 5. A project consultation group made up of subject matter experts will review and assess the quality of the deliverables.
11.	**Qualified Professionals.** Outline the procurement process and how you will select a qualified professional to complete this project. The procurement process will follow the District of Ucluelet's Purchasing Policy. A project of this scale will require a formal tender or Request for Proposal advertised nationally using the Provinces of British Columbia's BC Bid Service.
12.	**Additional Information.** Please share any other information you think may help support your submission**.**

SECTION 4: Required Application Materials

Only complete applications will be considered for funding. The following separate attachments are required to be submitted as part of the application:

- Local government Council or Board resolution, or Treaty First Nation resolution, indicating support for the current proposed activities and willingness to provide overall grant management.
- Detailed workplan and budget for each component identified in the application. This must include a breakdown of work activities, tasks, deliverables or products, resources, timelines (start and end dates), and other considerations or comments. The budget must clearly identify the CEPF funding request, applicant contribution, and/or other grant funding.
- Map identifying the location of the proposed project.
- If applicable, copies of any relevant documents that support the rationale for this project must be included with this application.

SECTION 5: Signature	
I certify that: (1) to the best of my knowledge, all information is accurate and (2) the area covered by the proposed project is within our local authority's jurisdiction (or appropriate approvals are in place).	
Name: Bruce Greig	Title: Manager of Community Planning
Signature: *An electronic or original signature is required.*	Date: February 21, 2019

Submit applications to Local Government Program Services, Union of BC Municipalities

E-mail: cepf@ubcm.ca

Mail: 525 Government Street, Victoria, BC, V8V 0A8

B. Detailed Workplan

District of Ucluelet Flood Risk Assessment, Flood Mapping & Mitigation Planning - CEPF Grant

Activities	Tasks	Deliverables/ Products	Resources	Timelines Start and Dates
Request for proposal	Work with District of Tofino (DoU) staff to develop RFP.	Request for Proposal.	DoU Lead and staff assistance as required.	June 2019
Review proposals and award contract	Review of applications, development and award of contract.	Contract awarded to Consultant.	DoU Lead and staff assistance as required.	July 2019
Meet consultant	Discuss scope of work, project deliverables and timelines.	Commencement of works.	Consultant, DoU Lead, and staff assistance as required.	July 2019
Coastal Flood Data Collection	As identified in the contract.	Data collection and analysis, MET coastal ocean study, wave modelling.	As required by consultant.	August to September 2019
Project Management	Regular review and reporting of progress.	Progress reports for project milestones.	DoU Lead, and staff assistance as required.	July 2019 to February 2020
Stakeholder Engagement	Engage stakeholders for input through a community workshop.	Community workshop.	Consultant, DoU Lead, and staff assistance as required.	October 2019
Coastal Flood Mapping	Creation of deliverables.	Creation of flood mapping.	As required by consultant.	September 2019 to January 2020
Completed Mapping	Review of deliverables.	Completed flood mapping that meets APEGBC professional practice guidelines.	Consultant, DoU Lead, Emergency Program Coordinator, and staff.	February 2020
Stakeholder Engagement	Engage stakeholders to share results from mapping.	Community workshop. Distribution of Coastal Flood Risk Assessment report.	Consultant, DoU Lead, and staff assistance as required.	February 2020

Integration	Review relevant policies and bylaws for alignment with	Updated and or new policies and bylaws such as OCP	DoU Planning staff, and staff assistance as required.	February to May 2020
Risk Assessment	Update NDMP risk assessment.	Utilize completed mapping data to complete Risk Assessment Information Template.	DoU Emergency Program Coordinator, and staff assistance as required.	February to May 2020
Project Reporting	Submit final report to grantor.	Completed Final Report Form & Financial Summary.	DoU Lead, and staff assistance as required.	June 2020

C. Detailed Budget

District of Ucluelet Flood Risk Assessment, Flood Mapping & Mitigation Planning - CEPF Grant

Budget Item	Amount	Source
Consultant Fees for coastal flooding data collection and mapping	$150,000	CEPF Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning 2019 Grant
DoU Staff wages: • Emergency Program Coordinator • Planner • Manager Community Planning	$13,000 (In kind contribution)	District of Ucluelet
Office supplies / Meeting venue rentals / Public consultation materials	$2,000 (In kind contribution)	District of Ucluelet

D. Location Map

District of Ucluelet Flood Risk Assessment, Flood Mapping & Mitigation Planning - CEPF Grant