WHATCOM COUNTY CONTRACT INFORMATION SHEET

Whatcom County Contract No. 201909005

Originating Department:	Public Works
Division/Program: *(i.e. Dept. Division and Program)*	Natural Resources (907010)
Contract or Grant Administrator:	Gary Stoyka
Contractor's / Agency Name:	City of Bellingham

Is this a New Contract? Yes ◉ No ○ If not, is this an Amendment or Renewal to an Existing Contract? Yes ○ No ◉
If Amendment or Renewal, (per WCC 3.08.100 (a)) Original Contract #: _____

Does contract require Council Approval? Yes ◉ No ○ If No, include WCC: _____
Already approved? Council Approved Date: _____ (Exclusions see: Whatcom County Codes 3.06.010, 3.08.090 and 3.08.100)

Is this a grant agreement?
Yes ○ No ◉ If yes, grantor agency contract number(s): _____ CFDA#: _____

Is this contract grant funded?
Yes ○ No ◉ If yes, Whatcom County grant contract number(s): _____

Is this contract the result of a RFP or Bid process?
Yes ○ No ◉ If yes, RFP and Bid number(s): _____ Contract Cost Center: 169119

Is this agreement excluded from E-Verify? No ○ Yes ◉ If no, include Attachment D Contractor Declaration form.

If YES, indicate exclusion(s) below:

- ☐ Professional services agreement for certified/licensed professional.
- ☐ Contract work is for less than $100,000.
- ☐ Contract work is for less than 120 days.
- ■ Interlocal Agreement (between Governments).
- ☐ Contract for Commercial off the shelf items (COTS).
- ☐ Work related subcontract less than $25,000.
- ☐ Public Works - Local Agency/Federally Funded FHWA.

Contract Amount:(sum of original contract amount and any prior amendments):
$ 125,000

This Amendment Amount:
$ _____

Total Amended Amount:
$ _____

Summary of Scope:

Council approval required for; all property leases, contracts or bid awards **exceeding $40,000**, and professional service contract amendments that have an increase greater than $10,000 or 10% of contract amount, whichever is greater, **except when:**

1. Exercising an option contained in a contract previously approved by the council.
2. Contract is for design, construction, r-o-w acquisition, prof. services, or other capital costs approved by council in a capital budget appropriation ordinance.
3. Bid or award is for supplies.
4. Equipment is included in Exhibit "B" of the Budget Ordinance.
5. Contract is for manufacturer's technical support and hardware maintenance of electronic systems and/or technical support and software maintenance from the developer of proprietary software currently used by Whatcom County.

Interlocal funding agreement between Whatcom County and the City of Bellingham for support of the US Geological Survey's development and implementation of the COastal Storm MOdeling System (COSMOS) across the Whatcom County shoreline.

Term of Contract: 2 years	Expiration Date: 7/31/21

Contract Routing:

1. Prepared by:	Gary Stoyka	Date: 8/20/19
2. Attorney signoff:	Christopher Quinn	Date: 8/21/19
3. AS Finance reviewed:	M Caldwell	Date: 8/21/19
4. IT reviewed (if IT related):		Date:
5. Contractor signed:		Date:
6. Submitted to Exec.:	✓	Date: 9-3-19
7. Council approved (if necessary):	✓	Date: 9/10/19
8. Executive signed:	✓	Date: 9/11/19
9. Original to Council:	✓	Date: 12-27-19

Last edited 04/11/19

INTERLOCAL FUNDING AGREEMENT BETWEEN WHATCOM COUNTY AND THE CITY OF BELLINGHAM FOR SUPPORT OF US GEOLOGICAL SURVEY'S DEVELOPMENT AND IMPLEMENTATION OF THE COASTAL STORM MODELING SYSTEM ACROSS THE WHATCOM COUNTY SHORELINE

THIS INTERLOCAL FUNDING AGREEMENT ("**Agreement**") is entered into by and between the City of Bellingham (the "**City**") and Whatcom County (the "**County**"), collectively the "Parties."

RECITALS

WHEREAS, the City and the County have a mutual interest in identification and reduction of hazard risks associated with sea level rise and storm surge; and

WHEREAS, the City is prepared to enter into a collaborative agreement with the U.S. Geological Survey ("**USGS**"), substantially in the form attached hereto as Appendix 1 ("**Collaborative Agreement**"), for the purpose of developing and implementing a Coastal Storm Modeling System ("**CoSMoS**") across the Whatcom County shoreline to evaluate impending coastal hazards and inform hazard mitigation and adaptation planning for property, infrastructure, habitats and restoration actions (the "**Project**"); and

WHEREAS, the CoSMoS is a comprehensive coastal hazards modeling system that simulates the combined physical interaction of changes in the magnitude, frequency and timing of sea-level rise, storm surge, wave, and stream runoff events to predict sea level rise and storm-induced flooding and erosion; and

WHEREAS, the CoSMoS will help answer complex questions related to how natural hazards are likely to evolve as changes in sea level, coastal storms, fluvial sediment loads, and groundwater interact in the coming decades/century; and

WHEREAS, the CoSMoS will help inform, identify, prioritize and implement land-use actions and adaptation strategies that mutually benefit hazards risk reduction and where possible, habitat/ecosystem restoration for enhanced resilience and cost-efficiencies; and

WHEREAS, the total cost of the Project is anticipated to be approximately $500,000; and

WHEREAS, the City's entry into the Collaboration Agreement is contingent upon securing funding commitments for the Project from other governments and stakeholders in Whatcom County who are interested in, and will benefit from, the development and implementation of a CoSMoS for the Whatcom County shoreline; and

WHEREAS, the City has secured preliminary funding commitments, pending final agreement, from the following stakeholders: USGS, Whatcom County, the Port of Bellingham, the City of Blaine, Lummi Nation, private industry; and

WHERES, the County is interested in and will benefit from the Project and, therefore, desires to provide funding and other support to its development and implementation, as provided herein.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

TERMS AND CONDITIONS

1. TERM

(a) This Agreement shall be effective August 1, 2019 and shall continue through July 31, 2021, unless terminated pursuant to part (b) below.

(b) This Agreement shall be terminated by provision of written notice from the City to the County if the City does not enter into the Collaborative Agreement with USGS.

2. CITY'S RESPONSIBILITIES

(a) The City shall make a good faith effort to obtain funding commitments for the Project from other stakeholders and enter into funding agreements with said stakeholders, similar in form and substance to this Agreement.

(b) The City shall enter into the Collaborative Agreement with USGS, substantially in the form attached hereto as Appendix 1, provided the City secures enforceable funding commitments with other stakeholders sufficient to allocate the costs equitably across the participating stakeholder group, as determined by the City.

(c) The City shall pay all costs invoiced by USGS pursuant to the Collaborative Agreement and, in turn, invoice each participating stakeholder for such entity's allocated share.

(d) The City shall provide the County and other participating stakeholders with the opportunity to participate in meetings to receive interim finding reports and discuss

information needs. The City shall also provide the County and other participating stakeholders with the opportunity to assist in identifying pilot sites for the assessment of projected change in potential bluff erosion and retreat rates, bluff hazards, and sediment production to beaches expected with sea level rise and higher wave energy.

3. COUNTY'S RESPONSIBILITIES

(a) The County shall contribute the following amounts to the Project: $10,000 in year 2019 and $115,000 in year 2020.

(b) The City will invoice the County quarterly. The County shall promptly review and process invoices in accordance with its usual procedures. Invoices not paid within sixty (60) days of the date of invoicing shall accrue interest at the rate of 12% per annum. A short program update shall accompany each invoice.

4. PERSONS RESPONSIBLE FOR ADMINISTRATION OF THE AGREEMENT

The persons responsible for administration of this Agreement shall be:

Clare Fogelsong
Natural Resources Policy Manager
Public Works Department
City of Bellingham
2200 Nevada Street
Bellingham, WA 98229
Phone: (360) 778-7965
Fax: (360) 778-7801

Gary Stoyka
Natural Resources Manager
Public Works Department
Whatcom County
322 N. Commercial St., Ste 110
Bellingham, WA 98225
Phone: (360) 778-6218
Fax: (360) 778-6231

5. LEGAL RELATIONS

In performing the services outlined in this Agreement, neither party is acting as the agent or employee of the other; rather, each party is acting as an independent contractor.

6. LIABILITY

The City agrees to release, defend and indemnify the County from any claims, damages or liabilities arising out of the acts or omissions of the City, its staff members and its contractors in the performance of this Agreement. Likewise, the County agrees to defend and indemnify the City from any claims, damages or liabilities arising out of the acts or omissions of the County, its staff members and its contractors in the performance of this Agreement.

7. MODIFICATIONS

The terms of this Agreement may be changed, modified, amended or waived only by written agreement executed by the Parties hereto. Waiver or breach of any term or condition of this Agreement shall not be considered a waiver of any prior or subsequent breach.

8. APPLICABLE LAW

In the performance of this Agreement, it is mutually understood and agreed upon by the Parties hereto that this Agreement shall be governed by the laws of the State of Washington, both as to interpretation and performance, and the venue of any action arising herefrom shall be in the Superior Court of the State of Washington in and for Whatcom County.

9. SEVERABILITY

In the event any term or condition of this Agreement or application thereof to any person or circumstances is held invalid, such invalidity shall not affect other terms, conditions, or applications of this Agreement that can be given effect without the invalid term, condition, or application. To this end the terms and conditions of this Agreement are declared severable.

10. ENTIRE AGREEMENT

This Agreement contains all the terms and conditions agreed upon by the Parties. All items incorporated herein by reference are attached. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the Parties hereto.

11. RECORDATION

Upon execution of this Agreement, the County shall file a copy of it with the office of its County Auditor pursuant to the requirements of RCW 39.34.

EXECUTED this 11th day of Sept, 2019 for **WHATCOM COUNTY**:

Jack Louws
County Executive

DEPARTMENTAL APPROVAL:

Jon Hutchings
Public Works Director

APPROVED AS TO FORM:

Christopher Quinn
Prosecuting Attorney's Office

EXECUTED this 3rd day of Dec., 2019 for **CITY OF BELLINGHAM**:

Kelli Linville
Mayor

ATTEST:

Finance Director

DEPARTMENTAL APPROVAL:

CC. RL

Eric Johnston, Interim PW
Director

APPROVED AS TO FORM:

Office of the City Attorney

APPENDIX I

COLLABORATIVE AGREEMENT

This Collaborative Agreement ("Agreement") is entered into by and between the U.S. Geological Survey (USGS), a bureau of the Department of the Interior, through the offices of its **Pacific Coastal and Marine Science Center**, hereinafter referred to as the "USGS" and **City of Bellingham, Public Works, Bellingham, Washington**, hereinafter referred to as "Collaborator." USGS and Collaborator are sometimes herein referred to as a "Party" and collectively as the "Parties." Any inconsistency between the standard terms of Articles 1 through 16 of this Agreement and any attachments to this Agreement shall be resolved by giving precedence to Articles 1 through 16.

Whereas, the USGS is authorized to perform collaborative work and prosecute projects in cooperation with other agencies, Federal, State or private, pursuant to 43 USC §36c; and

Whereas, the USGS is authorized to receive payments in arrears from any State, Territory, Tribe, possession, or political subdivision by 43 USC §50b, and;

Whereas, the USGS has a mission to conduct research and advance understanding, modeling capacity, and decision-support tools to aid in the assessment of natural hazards to property, infrastructure, industry and ecosystem services that communities depend upon and has the need of gathering empirical and validation data to support this mission; and

Whereas, Collaborator has the mission to conduct studies that support identification, evaluation and implementation of natural hazard risk (e.g., flooding) and habitat management measures and has the need of USGS expertise in measuring and modeling hydrodynamics, sediment transport and natural hazards risk; and

Whereas, the Project entitled **PS-CoSMoS to Inform City of Bellingham Adaptation Planning** is intended by the Parties to be mutually beneficial and to benefit the people of the United States;

Now, therefore, the Parties hereto agree as follows:

1. **Statement of Work.** See the attached Statement of Work (SOW) (Attachment A), incorporated by reference herein.

2. **Principal Investigator.** The USGS principal investigator (PI) for this Project is **Eric Grossman, 360-650-4697, egrossman@usgs.gov, WWU Dept. of Geology, 516 High St., MS9080, Bellingham, WA 98225**. The PI for the Collaborator is **Clare Fogelsong, 360-778-7965, Natural Resources Policy Manager, Bellingham Public Works, Bellingham, WA 98225**. In the event that a PI is unable to continue in this Project, the sponsoring agency will make every effort to provide a replacement acceptable to the other Party.

3. **Title to Equipment.** There will be no joint property purchased as a result of the collaborative effort outlined in the SOW. Each Party will provide its own equipment necessary to support its participation in the SOW.

4. **Term.** The collaborative effort contemplated by this Agreement will commence on the effective date of this Agreement. The effective date of this Agreement shall be the later date of (1) July 1, 2019 or (2) the date of the last signature by the Parties. The expiration date of this Agreement shall be two years from the start date.

5. **Funding/Resource Share.**
(a) The Collaborator will provide an estimated $340,000 in funds-in to the Project. The Collaborator is providing in-kind services and or resources with an estimated value of: $15,000 in the form of equipment aiding the collection of data and City staff time to help access existing GIS data maintained by the City. (b) If the Collaborator is a non-governmental organization, the USGS requires an advance of $**[0]**. (c) If the Collaborator is a government organization such as a State, Territory, Tribe, possession or political subdivision thereof, the following shall apply: The USGS will submit invoices on a **quarterly** basis. Invoices not paid within **60 days from date of bill,** will bear Interest, and other fees required by Federal law, at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury. (d) The USGS is providing in-kind services and or resources with an estimated value of: $126,000 to the Project that include salary support for Dr. Eric Grossman ($31,225), Patrick Barnard ($20,740), Li Erikson ($14,770) and operational expenses, principally equipment costs ($12,500), contracts ($15,000) and travel ($2,500).

6. **Amendments/Termination**. This Agreement can be changed or amended only by a written instrument signed by the Parties. This Agreement may be terminated by either Party on thirty (30) days written notice to the other Party. In the event of an early termination, USGS shall be reimbursed for any completed work or work in progress on the effective date of termination (i.e., when the Agreement actually terminates following the receipt of written notice from the other Party). Any unspent advanced funds will be returned to Collaborator. The USGS shall provide a copy of the outcomes completed as of the effective date of termination in the event of an early termination of the Agreement.

7. **Scientific Information/Data**.
Each Party is free to publish the information and data developed in the performance of the statement of work (SOW) and data management plan (DMP). Before a Party submits the information and data for publication or otherwise intends to publicly release or disclose scientific information and data that is jointly developed, the other Party will be provided thirty (30) days for review of the proposed release or disclosure, prior to submission for publication. The Parties acknowledge that scientific information and data developed using USGS funds as a result of the SOW are subject to applicable USGS Fundamental Science Practices (FSP) review, approval, and release requirements, which are available in Survey Manual Chapter (SMC) 502.4, Fundamental Science Practices: Review, Approval, and Release of Information Products. The USGS is required to provide timely public access to the results of scientific information and data associated with federally funded research that does not contain sensitive protected information. Data and associated metadata will be open format and publicly accessible. The data and metadata will also be open access and machine readable in accordance with USGS FSP requirements available in SMC 502.7, Fundamental Science Practices: Metadata for USGS Scientific Information Products Including Data and SMC 502.8, Fundamental Science Practices: Review and Approval of Scientific Data for Release.

8. **(Reserved)**

9. **Notices.** Any notice required to be given or which shall be given under this Agreement shall be in writing and delivered by first-class mail to the Parties as follows:

USGS:

Technical:
Eric Grossman
WWU Dept. of Geology
516 High St., MS9080
Bellingham, WA 98225
egrossman@usgs.gov
360-650-4697

Administrative:
Paulette Zamora
USGS/PCMSC
2885 Mission St.
Santa Cruz, CA 95060
pzamora@usgs.gov
831-460-7431

Collaborator:

Technical:
Clare Fogelsong
City of Bellingham Public Works
104 W. Magnolia St.
Bellingham, WA 98225
mailto:cfogelsong@cob.org
360-778-7965

Administrative:
Clare Fogelsong
City of Bellingham Public Works
104 W. Magnolia St.
Bellingham, WA 98225
mailto:cfogelsong@cob.org
360-778-7965

Financial Contact Information for Collaborator:

Amy Butler
City of Bellingham Public Works
104 W. Magnolia Street
Bellingham, WA 98225
Phone: 360-778 7747
abutler@cob.org
FAX 360-778 7901
[DUNS No.] 010211977
[Tax ID No.] 91-6001229
https://www.cob.org/gov/dept/finance

10. **Independent Organization.** For purposes of this Agreement and all research and services to be provided hereunder, each Party shall be, and shall be deemed to be, an independent Party and not an agent or employee of the other Party. Each Party shall have exclusive control over its employees in the performance of the SOW. While in field locations, a Party's employees must adhere to the safety and technical requirements imposed by the Party controlling the work site.

Neither Party has authority to make any statements, representations, or commitments of any kind, or take any action, which shall be binding on the other Party, except as may be explicitly

provided for herein or authorized in writing. Neither Party has authority to use the name of the other in advertising or in other forms of publicity without the written permission of the other.

11. **Governing Law.**

(a) This Agreement is subject to interpretation under State and Federal law. If there is inconsistency between the laws, then Federal law is controlling. Each Party agrees to be responsible for the activities, including the negligence, of their employees. Responsibility of the USGS for the payment of claims for loss of property, personal injury, or death caused by the negligence or wrongful act or omission of a USGS employee, while acting within the scope of their employment, is limited to provisions of the Federal Tort Claims Act, 28 USC §§ 2671-80. USGS warrants that it is self-insured for the purposes of Worker's Compensation.

(b) The USGS and the Collaborator make no express or implied warranty as to the conditions of the research, merchantability or fitness for a particular purpose of the research, data, or resulting product incorporating data developed and exchanged under the SOW.

12. **Force Majeure.** Neither Party shall be held liable for any unforeseeable event beyond its control, not caused by the fault or negligence of such Party, which causes such Party to be unable to perform its obligations under this Agreement, and which it is unable to overcome by the exercise of due diligence including, but not limited to, flood, drought, earthquake, storm, fire, pestilence, lightning, and other natural catastrophes; epidemic, war, riot, civil disturbance, or disobedience; strikes, labor disputes, or failure, threat of failure, or sabotage; or any order or injunction made by a court or public agency. In the event of the occurrence of such a force majeure event, the Party unable to perform must promptly notify the other Party. It shall further use its best efforts to resume performance as quickly as possible and shall suspend performance only for such period of time as is necessary as a result of the force majeure event.

13. **Entire Agreement.** This Agreement contains all of the terms of the Parties and supersedes all prior Agreements and understandings related thereto. Due to the specialized nature of the collaborative work, this Agreement is non-assignable by both Parties.

14. **Disputes.** The signatories to this Agreement shall expend their best efforts to amicably resolve any dispute that may arise under this Agreement. Any dispute that the signatories are unable to resolve shall be submitted to the Director of the USGS or his/her designee and the Director of the Whatcom County Public Works, John Hutchings or his designee for resolution.

15. **Miscellaneous Provisions.** Pursuant to the Anti-Deficiency Act, 31 U.S.C. §1341 (a)(1), nothing herein contained shall be construed as binding the USGS to expend in any one fiscal year any sum in excess of its appropriations or funding in excess or what it has received for the collaborative work outlined in the SOW.

16. **Survivability.** The following provisions shall survive the termination of this Agreement: 7. Publications/Reports/ Data, and 14. Disputes.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed on the last date listed below.

ACCEPTED AND AGREED

The USGS signatory certifies that:

- **The USGS signatory is consistent with the delegations of authority to sign agreements, SMC 205.13.**
- **The Collaborator is a U.S. owned organization.**
- **The COI form has been coordinated with the Ethics Office, as applicable.**
- **This Collaborative Agreement contains standard terms only or, if it contains non-standard terms, it was sent to OPA for review.**

U.S. GEOLOGICAL SURVEY	COLLABORATOR
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

EXECUTED, this the ____ day of _____, 2019, for the **CITY OF BELLINGHAM**:

Approved as to Form:

_____ _____

Office of the City Attorney *Mayor*

Attest:

_____ _____

Finance Director *Department Head*

Attachment A: Statement of Work between USGS and City of Bellingham Public Works

PS-CoSMoS to Inform City of Bellingham and Whatcom County WA Adaptation Planning

Proposal for collaborative research between US Geological Survey, City of Bellingham, Whatcom County, Port of Bellingham, City of Blaine

Dr. Eric Grossman and Patrick Barnard

May 31, 2019

INSERT STATEMENT OF WORK HERE

I. Proposal

We propose to develop and implement the Coastal Storm Modeling System (CoSMoS) across the Whatcom County shoreline to evaluate impending coastal hazards and inform hazard mitigation and adaptation planning for property, infrastructure, habitats and restoration actions.

Problem Statement:

The Cities of Bellingham and Blaine and Whatcom County like many coastal communities across the Nation are actively planning adaptive management strategies to accommodate development and population growth and protect investments in infrastructure and ecosystems from natural hazards risk associated with climate change and sea level rise. Along with Whatcom County, the Port of Bellingham, and City of Blaine, the City of Bellingham is concerned with more frequent storm surge and wave impacts expected with sea-level rise and their compounding effect on stream flooding which is also projected to increase with more intense rainfall. Significant investments in storm/waste water, coastal development, Model Toxics Control Act (MTCA) cleanup, habitat restoration, and transport corridors (e.g., rail, roads) are already experiencing periodic impacts and are projected to respond in complex ways as these processes change, accelerate and compound impacts. A hydrodynamic model that simulates the combined physical interaction of changes in the magnitude, frequency and timing of sea-level rise, storm surge, wave, stream runoff events, is identified as an important tool to assess vulnerabilities, identify mitigation and adaptation strategies, and prioritize resilient actions including habitat restoration where it can benefit hazards (flood) risk reduction. The U.S. Geological Survey proposes to implement the PS-CoSMoS (Puget Sound Coastal Storm Modeling System) across Bellingham Bay and Whatcom County to help assess impending risks and opportunities for resilient investments.

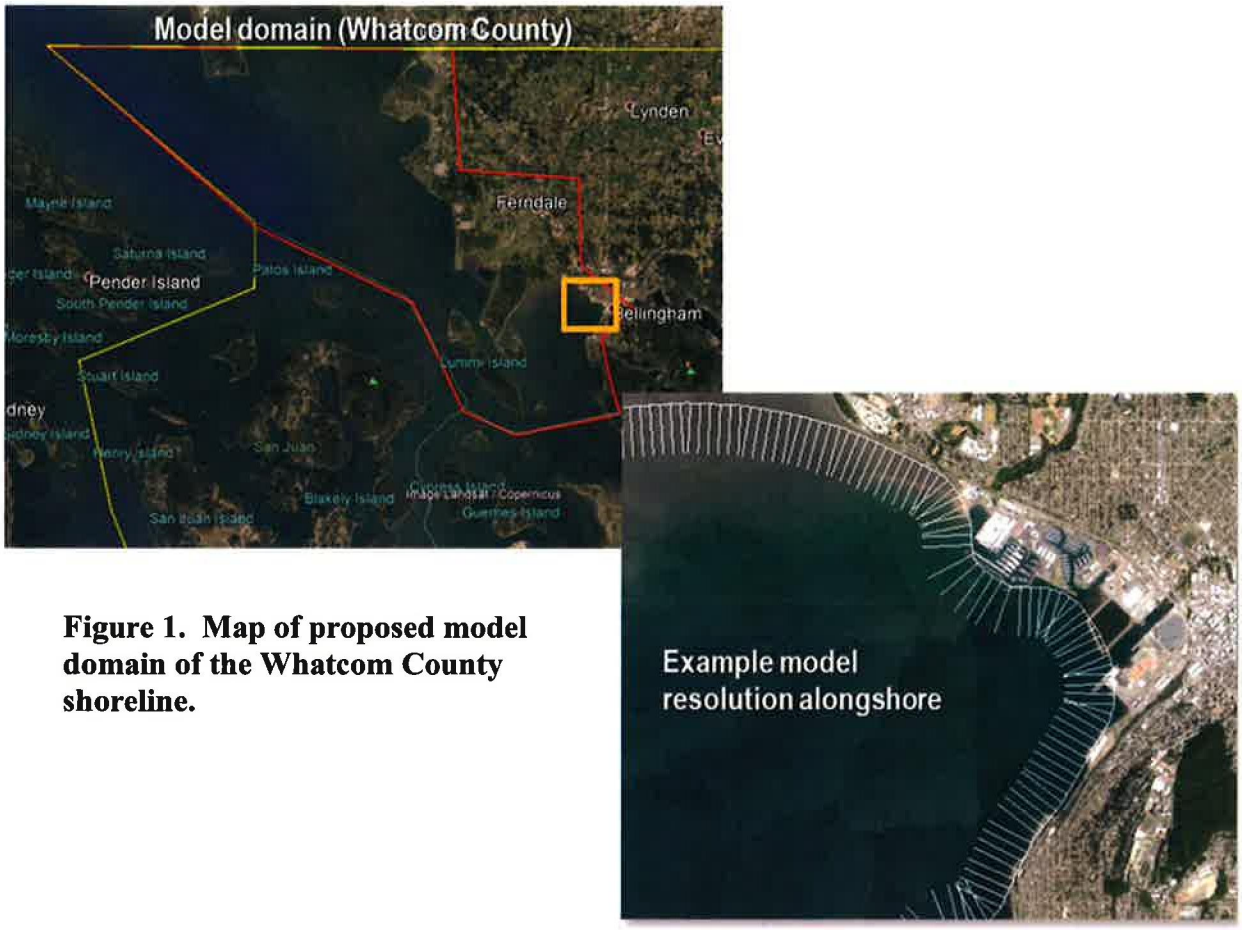


Figure 1. Map of proposed model domain of the Whatcom County shoreline.

PS-C0SMoS

PS-CoSMoS is a comprehensive coastal hazards modeling system that predicts SLR and storm-induced flooding and erosion (e.g., beach erosion) that are important for assessing impending physical damage and the geomorphic and habitat responses to climate change (walrus.wr.usgs.gov/coastal_processes/cosmos/puget/). PS-CoSMoS couples coastal storm processes including surge, waves and wind-wave setup with sea-level rise, tides/King tides, stream flow and circulation to predict flooding extent and physical processes that influence erosion and sediment transport out to the year 2100. Model outputs are designed to assess projected coastal climate change impacts along shorelines at a scale useful for planning (e.g., ~50 m to 2 m, depending on the management questions and are served via an interactive, web-based tool (www.ourcoastourfuture.org) that allows managers to evaluate and visualize flooding scenarios (maps). CoSMoS is based on 10 years of research and development with international partners and guidance from US Army Corps of Engineers and FEMA. It has been implemented across California in partnership with diverse federal, state, and local agencies and integrated with other tools including the USGS socioeconomic assessment tool HERA (https://www.usgs.gov/apps/hera/) that quantifies coastal flooding impacts. PS-CoSMoS can be coupled to ground water models to help inform changes to coastal aquifer salinity intrusion, retardation of watershed runoff and drainage processes associated with higher coastal water levels and changes in coastal processes. USGS is testing the skill of coupling CoSMoS to shoreline evolution, bluff retreat, turbidity-light attenuation, habitat availability (eelgrass), and larval dispersal/recruitment models. USGS seeks partnerships to build PS-CoSMoS to improve evaluation of the magnitude,

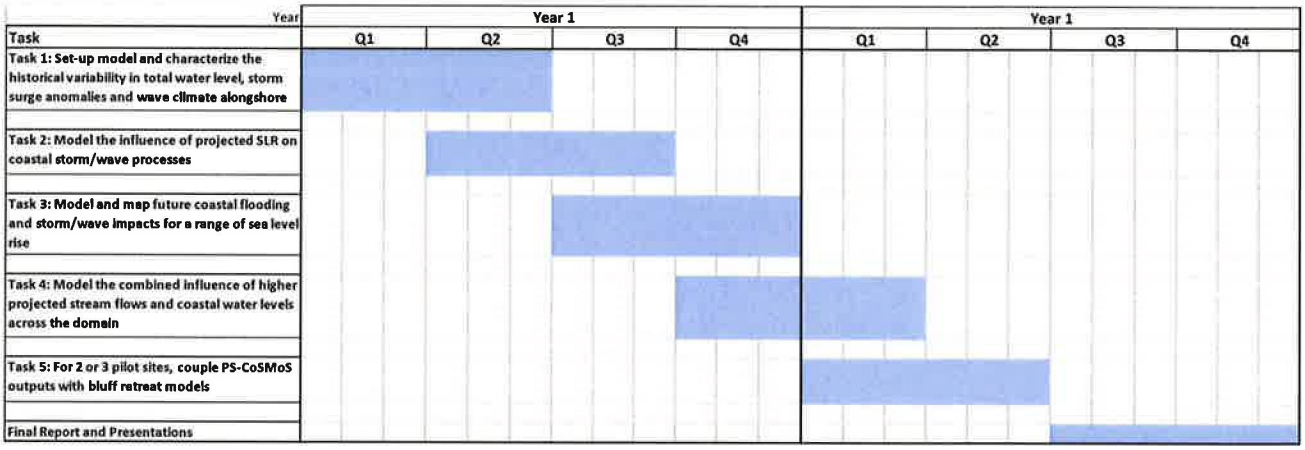
frequency, timing and probability of impacts to property, infrastructure, habitat suitability, ecosystem structure and function, restoration outcomes and ultimately community resilience.

Project Goals/Objectives:
The goals of the project are to:

1. Develop and implement PS-CoSMoS across the entire Whatcom County shoreline from end to end including Point Roberts and Lummi Island
2. Integrate information and data needs of City of Bellingham and Whatcom County into the assessment to inform priority hazard concerns
3. Work closely with project participants and community members to understand the utility and applicability of PS-CoSMoS for planning.

II. Term and Proposed Project Schedule/Milestones

Timeline: All deliverables completed by Dec 2021.



III. Collaborator's Role and Expertise

The Collaborator has 20+ years of experience conducting public works, infrastructure management and natural resource planning and co-managing lands and resources with federal, tribal, state and regional agencies to protect, restore lands, infrastructure, and habitats important to the City and County and society in general. The Collaborator works closely with many agencies to develop strategies and plan for improving ecosystem functions and flood and natural hazards management. The Collaborator conducts diverse research to assess and monitor changes in infrastructure performance and habitat structure and function for salmon, shellfish and other valued resources, and formulates strategies for habitat restoration and adaptive management. As such, Collaborator will coordinate several tasks that help gather important data, define science priorities, and communicate research objectives broadly to constituents and decision makers.

Specific Collaborator Tasks

- Collate and provide existing data including empirical data and past model results, reports
- Convene meetings with partners to share interim findings and identify information needs
- Coordinate science meetings among ongoing and new research teams
- Distribute results to stakeholders

IV. USGS' Role and Expertise

USGS leads multi-disciplinary research in the coastal zone addressing natural hazards and ecosystem science. USGS emphasizes research and development of decision support tools that help inform, identify, prioritize and implement land-use actions that mutually benefit hazards risk reduction and where possible, habitat/ecosystem restoration for enhanced resilience and cost-efficiencies. Institutional knowledge, infrastructure and expertise allow the USGS Pacific Coastal and Marine Science Center resourcefully conduct interdisciplinary science to help answer complex questions related to how natural hazards are likely to evolve as changes in sea level, coastal storms, fluvial sediment loads, and groundwater interact in the coming decades/century and affect land use, planning and adaptation strategies.

Specific USGS Tasks:
The USGS Pacific Coastal and Marine Science Center proposes to construct and implement PS-CoSMoS across Bellingham Bay and Whatcom County shorelines (Fig. 1) to assess the combined influence of SLR and climate change on future coastal flooding hazards and impacts through the following tasks:

- Task 1: Characterize the historical variability in total water level, storm surge anomalies and wave climate alongshore, including an extreme value analysis, based on available UW NNRP historical reanalysis over the period 1950-2010.
    - Rationale: ***Outputs provide quantitative data characterizing wave energy through time that can then be related to observed historical impacts, damages and costs to infrastructure, habitats and management actions. Extreme events and extreme event recurrence intervals (e.g., 20-yr event) will be defined and to provide baseline and context for assessing natural variability and impending changes in magnitude and frequency of extreme events (Task 2).***

- Task 2: Model the influence of projected SLR on coastal storm/wave processes alongshore including extreme event magnitude and recurrence frequency (e.g., how today's 20-, 100-yr event will change).
    - ***Rationale: Estimates the change in magnitude, frequency and duration of coastal impacts including extreme events to help identify thresholds and timing for planning and cost-benefit analyses. Understanding the influence of SLR (independent of climate change) provides flexibility to adjust (future) risk assessments as SLR estimates (i.e., rates) are revised with new science.***

- Task 3: Model and map future coastal flooding and storm/wave impacts for a range of sea level rise (e.g., 0 to 2 m in 0.5 m increments) and storm scenarios (e.g., background, annual, 1-yr, 20-yr, 100-yr and 500yr) as desired by City of Bellingham to cover planning horizons of concern, and assess socioeconomic impacts.
    - Rationale: ***Maps of the extent, depth and duration of flooding as well as the timing, frequency and location of impact threshold exceedances (e.g., daily tidal flooding, annual storms, 20-yr events, etc.) that can be used to evaluate impacts of critical infrastructure (e.g., buildings, transport corridors, facilities).***

- Task 4: Model the combined influence of higher projected stream flows and coastal water levels across the study domain.
    - Rationale: ***Maps and assessments of low topographic points, discharges (e.g., volumetric estimates of flood events), and analyses of flow routing facilitate evaluation of physically-based flood paths, vulnerable areas, and opportunities for stormwater capture/drainage infrastructure modifications to accommodate and reroute thresholds of flooding.***

- Task 5: For 2 or 3 pilot sites, couple PS-CoSMoS outputs with bluff retreat models to assess the projected change in potential bluff erosion and retreat rates, bluff hazards, and sediment production to beaches expected with SLR and higher wave energy. Potential sites could be Squalicum Beach Park, Little Squalicum Creek Beach, Locust Beach (Entire Whatcom County with Option 2).
    - Rationale: ***Maps inform hazard zones, quantitative data defines safer and more cost-effective setbacks, and metrics inform important shoreline and habitat protection, enhancement, and restoration opportunities.***

Anticipated Outcomes/Expected Results (Joint Outcomes and Results:

1. Gridded (raster) and feature GIS data layers of for 40 scenarios of future projected flood events including spatial extents, flood depth over land surface elevation, flood duration, wave heights and uncertainty for all scenarios modeled.
2. Feature class (polyline, point) GIS data layers of the change in recurrence frequency of extreme events and exceedance thresholds at specific times in the future, for example how will the recurrence frequency of today's 20-yr event increase by 2050 - will it occur multiple times each year?
3. Model plots of Generalized Extreme Value (GEV) analyses and projected change in recurrence frequency of extreme events for discrete stations along the Bellingham Bay and Whatcom County shoreline.
4. Model plots and GIS data layer of projected change in potential beach and bluff erosion at select pilot sites and future dates.
5. Report summarizing methods, data, model and skill, results and implications for coastal change and hazards risk across the study domain.

WHATCOM COUNTY
PUBLIC WORKS DEPARTMENT

Jon Hutchings
Director

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MEMORANDUM

TO: The Honorable Jack Louws, Whatcom County Executive
Honorable Whatcom County Flood Control Zone District Board of Supervisors

THROUGH: Jon Hutchings, Director JH

FROM: Gary S. Stoyka, Natural Resources Program Manager

DATE: August 20, 2019

RE: Interlocal Funding Agreement with City of Bellingham for Support of US Geological Survey's Development of the COastal Storm MOdeling System (COSMOS) across the Whatcom County Shoreline

Requested Action

Enclosed are two (2) originals of an interlocal funding agreement between Whatcom County and the City of Bellingham for support of U.S. Geological Survey's development of the COastal Storm MOdeling System (COSMOS) across the Whatcom County shoreline for your approval. Public Works respectfully requests that the County Executive, acting for the Whatcom County Flood Control Zone District (FCZD) Board of Supervisors, execute this agreement.

Background and Purpose

The US Geological Survey is proposing to develop a COastal Storm MOdeling System (COSMOS) for the Whatcom County shoreline. CoSMoS makes detailed predictions of storm-driven coastal flooding, erosion, and cliff failures that can be visualized using standard map viewers, mappable at scales fine enough to use for planning purposes. The current proposal is part of an effort to model all of Puget Sound. CoSMoS was developed to be useful for exploring past, present, and future coastal hazards: it can be used to perform "hindcast" studies to better understand historical events, support operational (real-time) applications to support emergency response, and generate future scenario-based coastal flooding simulations to support local coastal hazards and sea-level rise vulnerability planning. CoSMoS will provide information that can be used to increase public safety, mitigate physical damages, and more effectively manage and allocate resources within complex coastal settings. This information will likely benefit comprehensive planning, road protection/planning, parks planning, coastal flooding preparation, watershed planning, BBWARM planning, and emergency management planning.

Funding Amount and Source

The estimated budget for this agreement is $125,000.00. This amount will be funded as follows: 40% Road Fund, 30% General Fund, 20% Flood Fund, and 10% BBWARM Fund. The Flood Fund will provide $10,000 in funding in 2019. There are sufficient funds in the 2019 Flood Fund budget for this expenditure. The remaining $15,000 in Flood funding will be included in the 2020 FCZD Budget. Funding from the Road Fund, General Fund and BBWARM will be included in supplemental budget requests for the 2020 budget year.

Please contact Gary Stoyka at extension 6218, if you have any questions or concerns regarding the terms of this agreement.

Encl.