

**WHATCOM COUNTY CONTRACT  
INFORMATION SHEET**

Whatcom County Contract No.  
202303025

Originating Department:	Public Works
Division/Program: (i.e. Dept. Division and Program)	Natural Resources
Contract or Grant Administrator:	Chris Elder
Contractor's / Agency Name:	Western Washington University

Is this a New Contract? If not, is this an Amendment or Renewal to an Existing Contract? Yes  No   
 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? Contract \_\_\_\_\_  
 Yes  No  If yes, RFP and Bid number(s): \_\_\_\_\_ Cost Center: 16923

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):  
 \$ 30,054  
 This Amendment Amount:  
 \$ \_\_\_\_\_  
 Total Amended Amount:  
 \$ 30,054

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:**

- Exercising an option contained in a contract previously approved by the council.
- Contract is for design, construction, r-o-w acquisition, prof. services, or other capital costs approved by council in a capital budget appropriation ordinance.
- Bid or award is for supplies.
- Equipment is included in Exhibit "B" of the Budget Ordinance
- 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.

Summary of Scope: WWU staff and students will model the historical and projected hydrology in the Nooksack River to assess the impact of forest cover on winter peak flows.

Term of Contract: Upon approval Expiration Date: 12/31/2024

Contract Routing:

1. Prepared by: <u>Chris Elder</u>	Date: <u>3/16/2023</u>
2. Attorney signoff: <u>Christopher Quinn</u>	Date: <u>3/20/2023</u>
3. AS Finance reviewed: <u>Amy Martin</u>	Date: <u>3/28/2023</u>
4. IT reviewed (if IT related): _____	Date: _____
5. Contractor signed: _____	Date: _____
6. Submitted to Exec.: _____	Date: _____
7. Council approved (if necessary): <u>AB2023-252</u>	Date: <u>4/11/2023</u>
8. Executive signed: <u>Satpal Sidhu</u>	Date: <u>4/12/2023</u>
9. Original to Council: _____	Date: _____

**WHATCOM COUNTY  
PUBLIC WORKS DEPARTMENT**

**Elizabeth Kosa  
Director**



**NATURAL RESOURCES**

322 N. Commercial, Suite 110  
Bellingham, WA 98225  
Telephone: (360) 778-6230  
FAX: (360) 778-6231  
[www.whatcomcounty.us](http://www.whatcomcounty.us)

**MEMORANDUM**

**TO:** The Honorable Satpal Singh Sidhu, Whatcom County Executive, and The Honorable Members of the Whatcom County Council, collectively serving in their capacity as the Whatcom County Flood Control Zone District Board of Supervisors.

**THROUGH:** Elizabeth Kosa, Public Works Director

**FROM:** Gary Stoyka, Natural Resources Manager   
Chris Elder, Senior Watershed Management Planner

**DATE:** March 29, 2023

**RE:** Interlocal Agreement with WWU to assess impacts of forest cover on peak flows

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**Requested Action**

Attached for your review and approval is an interlocal agreement with Western Washington University to assess the impact of forest cover on peak flows in the Nooksack River basin.

**Background and Purpose**

This project includes modeling the historical and projected future hydrology in the Nooksack River with a focus on forest cover impacts in winter peak flows. Hydrologic modeling will employ the Distributed Hydrology Soil Vegetation Model (DHSVM), which uses physical characteristics of the basin and meteorological inputs to simulate snow accumulation and melt, evapotranspiration, soil moisture storage, and runoff. The project will expand upon current DHSVM modeling projects in the Nooksack in which the WWU research group is involved, including assessing projected peak flows based on the 2016 NOAA landcover and examining forest harvest scenarios in the South Fork of the Nooksack River watershed.

**Funding Amount and Source**

This project will be funded using Acme/VanZandt Subzone funding and is supported by the Acme Van Zandt Subzone Advisory Committee. There are sufficient funds in the 2023 budget for this expenditure.

Please contact Chris Elder at extension 6225, if you have any questions or concerns regarding the terms of this agreement.

Encl.  
Interlocal Agreement

Whatcom County Contract No.

\_\_\_\_\_202303025\_\_\_\_\_

**2023 INTERLOCAL AGREEMENT BETWEEN  
WHATCOM COUNTY FLOOD CONTROL ZONE DISTRICT AND  
WESTERN WASHINGTON UNIVERSITY FOR  
ASSESSING THE IMPACT OF FOREST COVER ON PEAK FLOWS IN THE NOOKSACK RIVER BASIN**

This Interlocal AGREEMENT (“AGREEMENT”) is between the Western Washington University (“WWU”) and the Whatcom County Flood Control Zone District (“FCZD”) as public agencies pursuant to the Interlocal Cooperation Act (RCW 39.34) for assessing the impact of forest cover on peak flows in the Nooksack River basin.

WHEREAS, Whatcom County has participated in cooperative watershed planning since at least 1999 through the Watershed Planning Act (RCW 90.82) and the Streamflow Restoration Act (RCW 90.94) as well as through other processes; and,

WHEREAS, Whatcom County participates in natural hazard mitigation planning and response; and,

WHEREAS, the FCZD requests assistance from the WWU for improved understanding of the impacts of forest cover on peak flows in the Nooksack River Basin; and,

WHEREAS, the FCZD has the authority to utilize the services and expertise of other agencies to further efforts beneficial to the residents and citizens of Whatcom County; and,

WHEREAS, WWU desires to provide such services to the FCZD.

NOW, THEREFORE, WWU and the FCZD agree as follows:

- I. *Purpose:* The purpose of this AGREEMENT is to set the terms whereby the FCZD will make available funds to WWU to implement an assessment of the impact of forest cover on peak flows in the Nooksack River Basin, as described in Exhibit A attached hereto.
- II. *Administration:* No new or separate legal or administrative entity is created to administer the provisions of this AGREEMENT.
- III. *Western Washington University Responsibilities:* WWU hereby agrees to conduct the work described in Exhibit A attached hereto.
- IV. *FCZD Responsibilities:* The FCZD hereby agrees to reimburse WWU, not to exceed the total budget amount allocated to WWU as shown in Exhibit B attached hereto, for the costs of providing and performing the services stated.
- V. *Payment:* WWU shall submit itemized invoices in a format approved by the FCZD in accordance with the requirements of Exhibit B. The FCZD will compensate WWU for services rendered within thirty (30) days following receipt of an approved invoice, provided all other terms and conditions of the contract have been met and are certified as such by the Contract Administrator.

- VI. *Term:* This AGREEMENT shall be effective for services performed upon Council approval through December 31, 2024.
- VII. *Responsible Persons:* The persons responsible for administration of this AGREEMENT shall be the Whatcom County Public Works (WCPW) Department Director designee (Contract Administrator) and WWU College of the Environment Dean or their respective designee.
- VII.1.** FCZD Contract Administrator  
Chris Elder, [celder@co.whatcom.wa.us](mailto:celder@co.whatcom.wa.us), (360)778-6225
- VIII. *Treatment of Assets and Property:* No fixed assets or personal or real property will be jointly or cooperatively acquired, held, used, or disposed of pursuant to this AGREEMENT.
- IX. *Indemnification:* Each party agrees to be responsible and assume liability for its own wrongful and/or negligent acts or omissions or those of their officials, officers, agents, or employees to the fullest extent required by law, and further agree to indemnify, and hold the other party harmless from any such liability. It is further provided that no liability shall attach to the Parties by reason of entering into this AGREEMENT except as expressly provided herein.
- X. *Modifications:* 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.
- XI. *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 and regulations of the State of Washington and the federal government, both as to interpretation and performance. The venue of any action arising here from shall be in the Superior Court of the State of Washington in and for Whatcom County.
- XII. *Severability:* In the event any term or condition of this AGREEMENT or application thereof to any person or circumstance 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.
- XIII. *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.
- XIV. *Performance:* The parties agree to satisfy all aspects of this AGREEMENT in a timely and professional manner. The WWU shall notify the FCZD as soon as problems, delays, or adverse conditions become known that will materially impair its ability to meet the deliverables described in Exhibit A.



- XV. *Audit and Inspection:* The FCZD and WWU shall maintain records pursuant to this AGREEMENT in accordance with generally accepted accounting principles and practices consistently applied. Records shall be subject at all reasonable times to inspection and audit and State auditor. The FCZD and WWU shall preserve and make such records available to said parties until expiration of three (3) years from the date of final payment under this AGREEMENT.
- XVI. *Dispute Resolution:* The parties to this AGREEMENT shall first attempt to resolve disputes informally at the staff level. In the event that the dispute cannot be resolved at the staff level, a dispute resolution procedure shall be followed under the guidance of the Whatcom Dispute Resolution Center.
- XVII. *Rights and Remedies:* In no event shall a making by the FCZD of any payment to the WWU constitute or be construed as a waiver by the FCZD of any breach of covenant or any default that may then exist on the part of the WWU. The making of any such payment by the FCZD while any such breach or default shall exist shall in no way impair or prejudice any of the FCZD's rights, which are hereby expressly recognized, to recover payments or portions thereof, to which the WWU has not entitled under this AGREEMENT, or where any payments were made by mistake, or to pursue any other remedy available to the FCZD in respect to breach or default of this AGREEMENT.

This AGREEMENT shall not relieve the FCZD or the WWU of any obligation or responsibility imposed by law except that performance pursuant to this AGREEMENT may, where appropriate, be offered in satisfaction of an obligation or responsibility conveyed to the FCZD or the WWU by law.

- XVIII. *Insurance Requirements:* WWU shall carry for the duration of this AGREEMENT insurance with the coverage and limits as follows:

- A. Commercial General Liability (CGL) Insurance

Property damage	\$500,000.00 per occurrence
General Liability & Bodily Injury	\$1,000,000.00 per occurrence
Annual Aggregate	\$2,000,000.00

- B. Business Automobile Liability

\$500,000.00 Minimum, per occurrence
\$1,000,000.00 Minimum, Annual Aggregate

WWU shall provide auto liability coverage for owned, non-owned and hired autos using ISO Business Auto Coverage form CA 00 01 or the exact equivalent with a limit of no less than \$500,000 per accident. If Contractor owns no vehicles this requirement may be met through a non-owned auto Endorsement to the CGL policy.

- C. Additional Insurance Requirements and Provisions

- 1. WWU shall provide FCZD with a certificate of insurance and endorsements required by the Agreement.

2. For the commercial general liability and business automobile insurance, Whatcom County Flood Control Zone District shall be named as an additional insured.
3. WWU's insurance shall be primary and non-contributory, and shall waive all rights of subrogation against Whatcom County Flood Control Zone District and its coverage. Whatcom County Flood Control Zone District's insurance shall not serve as a source of contribution.

In the alternative, either party to this agreement may fulfill the insurance obligations contained herein by maintaining membership in a joint self-insurance program authorized by RCW 48.62. In this regard, the parties understand that the party to this agreement who is a member of such a program is not able to name the other party as an "additional insured" under the liability coverage provided by the joint self-insurance program.

4. The State of Washington, including WWU, is self-insured for all exposures to tort liability, including general liability, professional liability, property damage liability and vehicle liability, as provided in statute Chapter 4.92 RCW – Action and claims against state, but only as respects the negligence of State. Whatcom County Flood Control Zone District shall be named as an additional insured. The parties agree that this coverage satisfies the insurance requirements shown above.

XIX. *Miscellaneous:* No obligation in this AGREEMENT shall limit the WWU in fulfilling its responsibilities otherwise defined by law. No obligation in this AGREEMENT shall limit the FCZD in fulfilling its responsibilities otherwise defined by law.

XX. *Signatures:* The undersigned representatives accept the provisions of this AGREEMENT. This AGREEMENT shall be in effect when signed by both parties.

IN WITNESS WHEREOF, the parties have signed this Agreement this 4/12/2023 day of \_\_\_\_\_, 2023.

**WESTERN WASHINGTON UNIVERSITY**

DocuSigned by:  
Joyce Lopes 4/12/2023  
1C5850A85B1244B...  
Joyce Lopes, Vice President, Business and Financial Affairs Date

Western Washington University  
516 High Street  
Bellingham, WA 98225

**WHATCOM COUNTY FLOOD CONTROL ZONE DISTRICT**

DocuSigned by:  
**Recommended for Approval:**  
Elizabeth Kosa 4/12/2023  
870E242DD76C408...  
Elizabeth Kosa, Director Date

**Approved as to form:**

/s/ Christopher Quinn by Jessie Smiley 3-29-23  
Christopher Quinn, Senior Civil Deputy Prosecuting Attorney Date

**Approved:**

Accepted for Flood Control Zone District:

DocuSigned by:  
Satpal Sidhu 4/12/2023  
By: 119267C18B664E3...  
Satpal Singh Sidhu, Whatcom County Executive Date

## EXHIBIT A - SCOPE OF WORK

### Overview

Project goals are to model the historical and projected hydrology in the Nooksack River with a focus on forest cover impacts in winter peak flows, using refined gridded historical and downscaled data from global climate models (GCMs) informed by the Weather Research and Forecasting (WRF) model. Hydrology modeling will employ the Distributed Hydrology Soil Vegetation Model (DHSVM; Wigmosta et al., 1994), which is physically based and distributed, and uses physical characteristics of the basin and meteorological (met) inputs to simulate hydrology factors such as snow accumulation and melt, evapotranspiration, soil moisture storage, and overall streamflow. The model has been applied extensively in the Nooksack River basin by the WWU research group (e.g., Dickerson-Lange and Mitchell, 2013; Dickerson, 2010; Murphy, 2015; Truitt, 2018; Knapp, 2018). WWU will use new historical and dynamically downscaled meteorological projections at a 1-hour time step that are processed using the WRF model by the Pacific Northwest National Laboratory data set and bias corrected for regional forecasting by the Climate Impacts Group (CIG) at the University of Washington.

The project will expand upon current DHSVM modeling projects in the Nooksack basin that the WWU research group is involved with, e.g., assessing projected peak flows based on the current, unchanging landcover (2016 NOAA landcover); and examining forest gaps (harvest scenarios) in the South Fork of the Nooksack River watershed. Both modeling efforts are using the DHSVM Version 3.2 that contains canopy-gap shading components (Sun et al., 2018). Forest gaps are known to influence snowpack, soil moisture, and runoff in watersheds (Dickerson-Lange et al., 2015).

The project timeline will be based on the schedule of an incoming M.S. graduate student at WWU that will start in the fall of 2022. Most M.S. projects are at least two years in length.

### Tasks

**Task 1—DHSVM setup.** The model domain will be the Nooksack River basin east of the USGS Cedarville stream gauge (Figure 1). The DHSVM requires digital grids of spatially variable watershed characteristics, including a digital elevation model, soil type, soil thickness, vegetation and landcover, and stream networks. These have been processed and setup for the North, Middle, and South Fork Nooksack Rivers using ArcGIS at a 150-meter resolution. Some modifications will be required, such as breaking the model domain into three basins rather than one large basin, i.e., the South, Middle, and North Forks.

**Task 2— Processing meteorological forcings.** Meteorological variables required by the DHSVM include precipitation, wind speed, humidity, and short-wave and long-wave solar radiation at a predefined time step (e.g., 1-hour to 1-day). A reliable peak-flow analysis will require more accurate short-duration precipitation (e.g., 1-hour) than that used in previous Nooksack modeling efforts (i.e., Livneh and MACA data; Murphy, 2016). New regional climate model historical and dynamically downscaled meteorological projections that were produced by the WRF model by the Pacific Northwest National Laboratory (Chen et al., 2018) will be applied and bias corrected for the Nooksack River basin (e.g., Mauger et al. 2021).

**Task 3— DHSVM calibration.** Calibration and validation of the model to historical conditions will be achieved by adjusting model parameters (e.g., precipitation and temperature lapse rates, snow/rain temperature thresholds, soil thickness and conductivities) and met inputs until the resulting simulated outputs provides a statistically reasonable match to observed historical data. Streamflow will be calibrated to four USGS stream gauges in Nooksack River basins (i.e., North Fork, Middle Fork, and South Fork Nooksack rivers, as well as the mainstem Nooksack River at Cedarville). Statistical tests outlined in Moriasi et al. (2007) and Moriasi et al. (2015) will be used to quantify the model skill (e.g., the Nash-Sutcliffe Efficiency coefficient and Root-Mean-Square Error). Snowpack outputs will be qualitatively compared to regional snow maps and SNOTEL stations.



**Task 4 – Development of forest cover grids.** Informed by Whatcom County, WADNR, the USFS and others, forest cover scenarios will be developed in ArcGIS as a series of canopy gap landcover grids (progressive harvesting about every decade) for the forest harvestable areas in the Nooksack River basin (Figure 1). Landcover grids are generated from 30 meter, publicly available remote sensing data developed by the National Land Cover Database 2016 update and the NOAA Coastal Change Analysis Program (C-CAP; NOAA, 2019).

**Task 5—Model simulations.** Hydrology modeling will employ the calibrated and validated DHSVM and met data from GCMs downscaled to the Nooksack River basin. A series of forest-cover grids and an ensemble of WRF met projections will be simulated and analyzed. Computational resources are available at WWU.

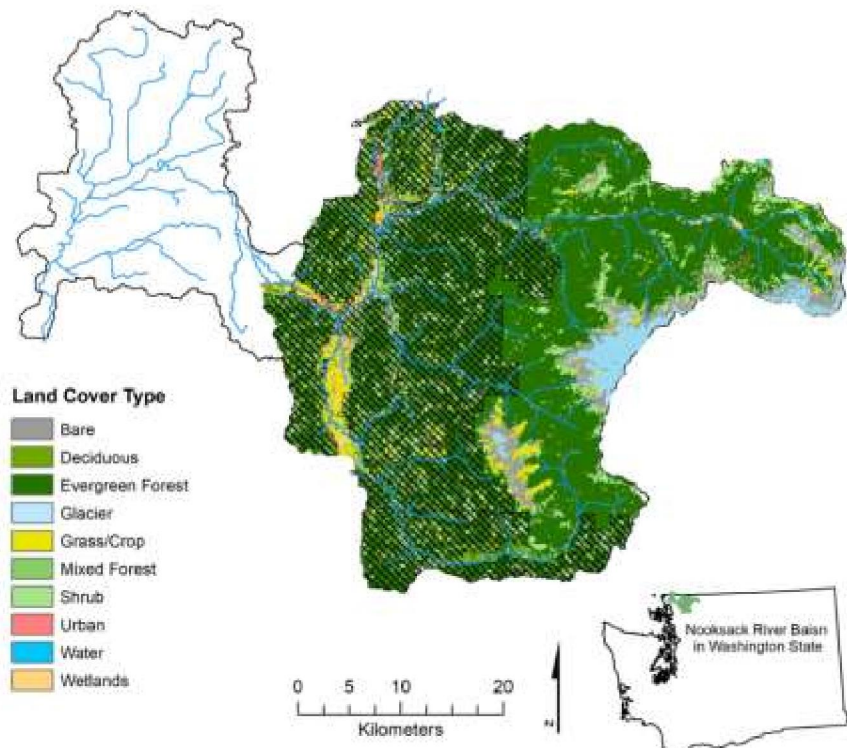
**Task 6—Data analysis.** The statistical package R will be used for all the data analyses and figure generation. Climate change simulation results will be generated and analyzed over 30-year intervals centered on the years 1996 (hindcast), 2050 and 2080. Peak streamflow analyses will be similar to that produced by [Mauger et al. \(2021\)](#) including changes in streamflow and return frequencies (e.g., 20-yr and 50-yr—3-hr and 3-day flows) at key locations in the Nooksack River (e.g., USGS Cedarville stream gauge).

**Task 7 – Reporting and Results Dissemination.** Written quarterly progress reports and any requested presentations will be delivered to Whatcom County Public Works and the Acme/Van Zandt Flood Control Subzone Advisory Committee.

#### Deliverables:

- A draft technical final report will be shared by September 1, 2024.
- A final report for a general audience will be delivered by December 31, 2024.
- Final GIS data rasters developed during project

Figure 1. Nooksack River basin in northwest Washington State. The hatched region represents forested areas that are potentially harvestable public and private lands.



## References

- Chen, X; Leung, R.L.; Gao, Y.; Liu, Y.; Wigmosta, M.; Richmond, M. (2018). Predictability of extreme precipitation in Western U.S. watersheds based on atmospheric river occurrence, intensity and duration. *Geophysical Research Letters*, AGU, Vol 45, Issue 21, p 11693–11701.
- Dickerson, Susan E., Modeling the effects of climate change forecasts on streamflow in the Nooksack River Basin (2010). WWU Graduate School Collection. 65. <https://cedar.wvu.edu/wwuet/65>
- Dickerson-Lange, S.E., and Mitchell, R. (2013). Modeling the effects of climate change projections on streamflow in the Nooksack River basin, Northwest Washington: *Hydrological Processes*, v. 28, p. 5236–5250, doi:10.1002/hyp.10012.
- Dickerson-Lange, S. E., Lutz, J. A., Martin, K. A., Raleigh, M. S., Gersonde, R., & Lundquist, J. D. (2015). Evaluating observational methods to quantify snow duration under diverse forest canopies. *Water Resources Research*, 51, 1203–1224. <https://doi.org/10.1002/2014WR015744>
- Knapp, Kevin, "The Effects of Forecasted Climate Change on Mass Wasting Susceptibility in the Nooksack River Basin" (2018). WWU Graduate School Collection. 807 <https://cedar.wvu.edu/wwuet/807>
- Mauger, G.S., J. Robinson, R.J. Mitchell, J. Won, and N. Cristea (2021). New Flood Projections for Snohomish County: Fine-scale Modeling and Dynamically-Downscaling. [Report](#) prepared for Snohomish County. Climate Impacts Group, University of Washington.
- Moriasi, D. N., Arnold, J. G., Van Liew, M. W., Bingner, R. L., Harmel, R. D., Veith, T. L.; (2007) Model Evaluation Guidelines for Systematic Quantification of Accuracy in Watershed Simulations. *Transactions of the ASABE*, vol. 50, no. 3, pp. 885-900., doi: 10.13031/2013.23153.
- Moriasi, D., Gitau, M., Pai, N., and Daggupati, P., (2015), Hydrologic and Water Quality Models: Performance Measures and Evaluation Criteria: *Transactions of the ASABE (American Society of Agricultural and Biological Engineers)*, v. 58, p. 1763–1785, doi:10.13031/trans.58.10715.
- Murphy, R.D. (2016) Modeling the Effects of Forecasted Climate Change and Glacier Recession on Late Summer Streamflow in the Upper Nooksack River Basin: WWU Masters Thesis Collection, <http://cedar.wvu.edu/wwuet/461>.
- NOAA, (2019). Washington State Landcover Data Set, 2016. Coastal Change Analysis Program (CCAP). Charleston, SC: NOAA Office for Coastal Management. Accessed November 2019 via: <https://coast.noaa.gov/ccapftp/#/>
- Sun, N., Wigmosta, M., Zhou, T., Lundquist, J., Dickerson-Lange, S., and Cristea, N. (2018). Evaluating the functionality and streamflow impacts of explicitly modelling forest–snow interactions and canopy gaps in a distributed hydrologic model: *Hydrological Processes*, v. 32, p. 2128–2140, doi:10.1002/hyp.13150.
- Truitt, Stephanie E. (2018). Modeling the Effects of Climate Change on Stream Temperature in the Nooksack River Basin. WWU Graduate School Collection. 642. <https://cedar.wvu.edu/wwuet/642>
- Wigmosta, M.S., Vail, L.W., and Lettenmaier, D.P. (1994). A distributed hydrology-vegetation model for complex terrain: *Water Resources Research*, v. 30, p. 1665–1679, doi:10.1029/94WR00436.

**EXHIBIT B - BUDGET****Assessing the Impact of Forest Cover on Peak Flows in the Nooksack River Basin**

As consideration for services provided in Exhibit A, Scope of Work, the FCZD agrees to compensate the contractor according to the actual composite hourly rates of personnel working on this project. Composite rates are based on actual wages and benefits, which may vary by month. Estimated hourly composite rates are provided below. Revised Composite Rate forms will be provided to the FCZD for any rate changes upon adjustment. The total budget is not to exceed \$30,054 and will be allocated as described in the table below. Standard WWU overhead is 25% of total direct costs (salaries) for regional governments.

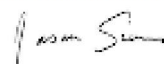
Contractor certifies that all personnel charging to this contract are program personnel and are not also included in the Contractor's overhead rate. Any work performed prior to the effective date or continuing after the completion date of the contract, unless otherwise agreed upon in writing, will be at the contractor's expense.

<b>Budget Items</b>	<b>Total</b>
<b>Personnel Salaries</b>	
<b>PI – Mitchell (Approx 116 hours)</b>	\$6,791
<b>Graduate Students (Approx. 344 hours)</b>	\$12,714
<b>Subtotal, salaries</b>	<b>\$19,505</b>
<b>Estimated Benefits (Fringe)</b>	
<b>PI – Mitchell (18%)</b>	\$1,222
<b>Graduate Students (35%)</b>	\$4,450
<b>Subtotal, fringe</b>	<b>\$5,672</b>
<b>Total Personnel (Salaries &amp; Fringe)</b>	<b>\$25,177</b>
<b>25% TDC (salaries)</b>	<b>\$4,876</b>
<b>Total Costs</b>	<b>\$30,054</b>



## EXHIBIT C - INSURANCE

## Assessing the Impact of Forest Cover on Peak Flows in the Nooksack River Basin

CERTIFICATE OF LIABILITY INSURANCE		Issue Date 3/2/2023		
<b>ISSUED BY:</b> State of Washington Department of Enterprise Services Office of Risk Management PO Box 41466 Olympia, WA 98504-1466		<b>THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE STATE OF WASHINGTON SELF INSURANCE LIABILITY PROGRAM.</b>		
		<b>COVERAGE AFFORDED BY</b> <b>State of Washington Self Insurance Liability Program</b>		
<b>INSURED:</b> State of Washington Western Washington University ATTN: Paul Mueller 516 High Street Bellingham, WA 98225		<b>THE STATE OF WASHINGTON, INCLUDING ALL ITS AGENCIES AND DEPARTMENTS, IS SELF-INSURED FOR TORT LIABILITY CLAIMS. ALL CLAIMS MUST BE FILED WITH THE STATE OFFICE OF RISK MANAGEMENT FOR PROCESSING IN ACCORD WITH STATUTORY REQUIREMENTS.</b>		
COVERAGES				
<b>THIS IS TO CERTIFY COVERAGE DESCRIBED BELOW IS PROVIDED TO THE INSURED NAMED ABOVE FOR THE PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE COVERAGE AFFORDED BY THE SELF-INSURANCE LIABILITY PROGRAM IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH PROGRAM.</b>				
TYPE OF COVERAGE	POLICY NUMBER	EFFECTIVE DATE	EXPIRATION DATE	LIMITS
<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> GENERAL LIABILITY <input checked="" type="checkbox"/> OCCURRENCE COVERAGE	Self-Insured	Continuous	Continuous	BODILY INJURY, PROPERTY DAMAGE & PERSONAL INJURY COMBINED EACH OCCURRENCE \$5,000,000
<b>AUTOMOBILE LIABILITY</b> <input type="checkbox"/> ANY AUTO <input checked="" type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS				BODILY INJURY & PROPERTY DAMAGE COMBINED EACH ACCIDENT \$5,000,000
<b>WORKERS COMPENSATION AND EMPLOYERS LIABILITY</b>	L & I	Continuous	Continuous	WC – STATUTORY
<b>OTHER</b>				
<b>DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS:</b> Coverage applies as respects tort liability claims against the State of Washington as covered by the Tort Claims Act (RCW 4.92 et seq.) The Certificate Holder is named as additional insured, but only as respects the negligence of the State of Washington.				
CERTIFICATE HOLDER:		CANCELLATION		
WHATCOM COUNTY FLOOD CONTROL ZONE DISTRICT 322 N. COMMERCIAL ST, 2ND FLOOR BELLINGHAM, WA 98225		<b>SHOULD THE SELF INSURANCE LIABILITY PROGRAM BE CANCELLED, THE STATE OF WASHINGTON WILL ENDEAVOR TO MAIL 45 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL NOT IMPOSE ANY OBLIGATION OR LIABILITY UPON THE STATE OF WASHINGTON, ITS OFFICIALS, EMPLOYEES, AGENTS OR REPRESENTATIVES.</b>		
<b>CERTIFICATE NUMBER CRT 2023-00464</b>		<b>AUTHORIZED REPRESENTATIVE:</b>  Jason Siems, State Risk Manager		