Flood Warning Analysis

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About me!

Ornie

she/her

Major: Bioengineering
Minors: Applied Mathematics & Chemistry

Internship

EARTHLAB
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EarthLab

Climate Impacts Group

Project Timeline

Week 1-2

Pick a specific gauge location and flow thresholds for testing the methodology using observed flows

Week 3-4

For each water year and each flow threshold, count the number of times flows exceed that threshold

Week 5-6

Investigate relationship between instantaneous and daily avg flows with the model data

Week 7-9

Flood Warning Calculation:
1950-2100
Pick historical and future time periods
Calculate change as future vs historical

Walla Walla Flood

Location Map:

- February 2020 flood caused severe damage to Walla Walla's infrastructure.
- The community faced significant threats from rising water levels.
- My work improves future flood prediction accuracy, helping protect such region.

“In my career, which is going about 27 years now, this is the worst since 1996, I would say,” National Weather Service meteorologist Mary Wister.

Greg Lehman

Methodology

Data Acquisition:

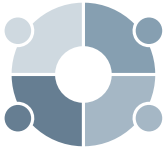
Processed daily streamflow data from NOAA and USGS and CIG datasets.

01

Threshold Analysis:

Calculated flow threshold exceedances per water year in MATLAB.

02



Temporal Projection:

Assessed flood warning changes from 1991-2099 for historical and future time periods.

04

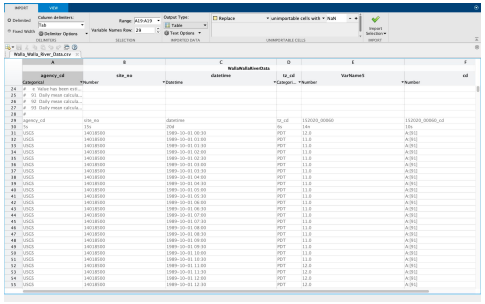
Regression Modeling:

Analyzed relationships between instantaneous and daily average flows.

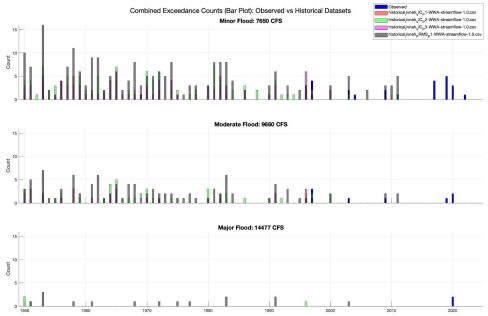
03

Plots

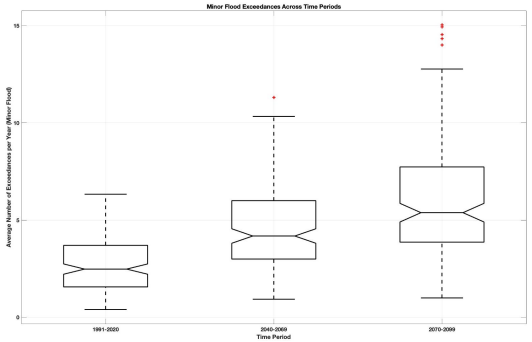
01 Data Acquisition:



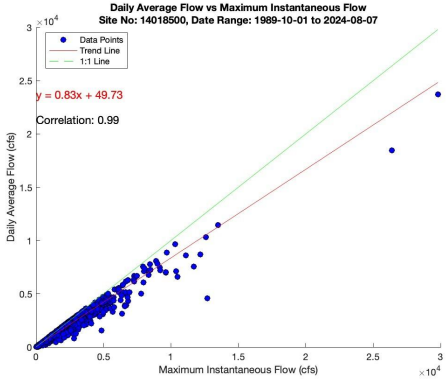
02 Threshold Analysis:



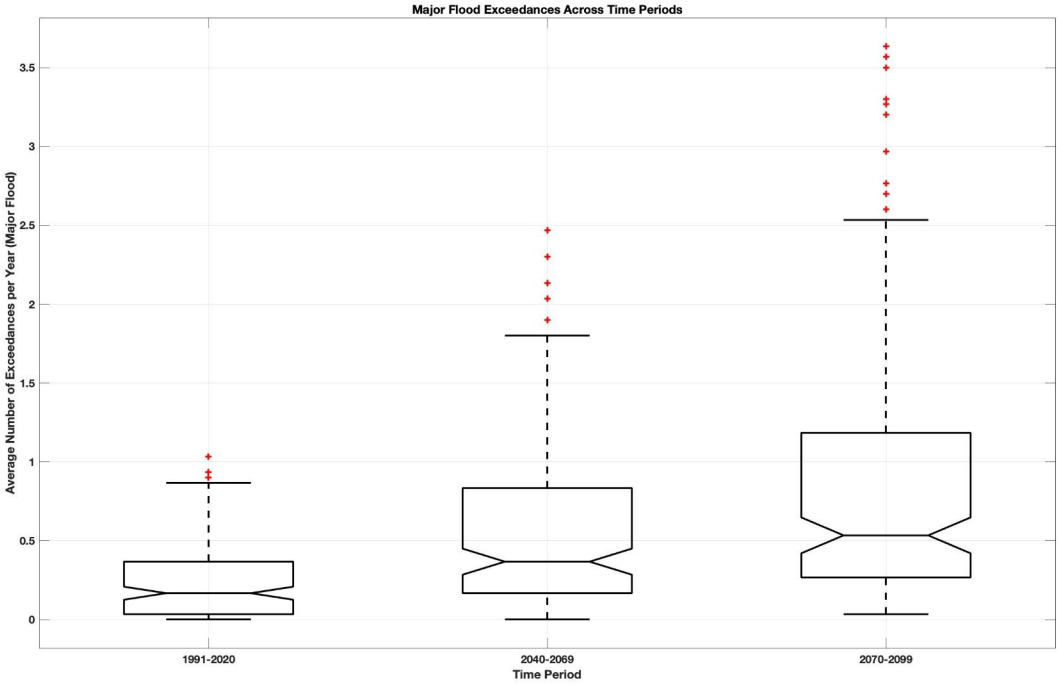
04 Temporal Projection:



03 Regression Modeling:



Results



Rising Flood Risk

More major floods are expected in future periods compared to the past.

Greater Variability

Flood frequency becomes more unpredictable over time.

Extreme Events

Some future years could see a spike in major floods.

Reflection

Skill Development

Enhanced public speaking and scientific communication skills, gained experience in control systems, and applied data analysis to real-world flood predictions.

Leadership Growth

Advocating for myself, set boundaries, and practiced active listening, integrating social justice principles.

Challenges and Solutions

Prioritizing tasks effectively, sought feedback, and navigated technical challenges with adaptive strategies.

Impact and Future Applications

Keep expanding flood prediction accuracy for the PNW, ensuring community preparedness by analyzing threshold exceedances using CIG datasets.

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Thank You!

Questions?