OBSERVATION OF SNOW PROCESSES THROUGH TIME-LAPSE PHOTOGRAPHY

CAITLIN BUSH
PROJECT SUMMARY

- Increase understanding of the effects of the mountain pine beetle

- Snow as a component of the hydrological processes in the No Name watershed

- Methods for quantifying snow processes
PROJECT SUMMARY

- Cameras systematically placed in three sites throughout the No Name watershed

- Cameras capture fluctuations in snow depths

- Time-lapse photography

- Photographic analysis

- Complimentary ongoing research
PREVIOUS RESEARCH

• Methods adopted from Garvelman et.al. (2013) & Farinotti et.al. (2010)
  • Differences in camera use
  • Photographic analysis
  • Snow stake improvement
CONTINUOUS DATA COLLECTION

- Monitor fluctuations of snowfall, snow melt, and redistribution on site

- Cameras at three locations, record data in 2-hour increments

- Elucidate surface water and groundwater connections
PHOTOGRAPHIC ANALYSIS

• Image-J allows for efficient photographic snow survey analysis

• Pixel analysis

• Compared with other data

• Method for long-term data acquisition
QUANTIFYING SNOW PROCESSES

- Current methods expensive in both time and money
- High resolution photography
- Understanding the watershed interactions post-mountain pine beetle
WHY IS THIS IMPORTANT?

• Snow is primary contributor to hydrological systems

• Snow quantification onerous due to topography

• Modeling to understand snow yields to environment and role in water budget
WHY IS THIS IMPORTANT?

- Photographic analysis less expensive, less time consuming
- Previous research has not assessed the use of game cameras
- Image-J improves on previous programs
WHY THIS IS IMPORTANT

• Snow stake accuracy

• Assessing new methods for potential use in future endeavors

• Effects of mountain pine beetle on No Name watershed
DESIGN/METHODS

• Cameras placed at three sites in the No Name watershed

• Cameras powered by local battery

• Data downloaded to local SD card

• Snow stake measurements
DESIGN/METHODS

• Data collection at each site

• Photographic data assessment

• Special precautions
PRELIMINARY DATA
PRELIMINARY DATA
CONCLUSION

• Snow processes contribute to hydrological and energy budgets

• Current methodology dangerous and expensive

• Photographic analysis accurate and inexpensive
ACKNOWLEDGEMENTS

- Daniel Beverly
- Heather Speckman
REFERENCES

