ANDREW CALDERWOOD

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SUMMARY

- Civil and Environmental Engineering education provided a strong focus on the physics and applications of water resources engineering which was rounded out by hydrology classes focusing on larger scale natural resources and numerical modeling
- Strong understanding of the foundational concepts, equations, and numerical methods used to model groundwater flow and transport
- Looking to contribute to the use of numerical methods to advance the study of groundwater-surface water interaction on the local and regional scale

TECHNICAL SKILLS

- **Data Visualization:** Cleaning, restructuring and plotting of both spatial and time series data in R and Python
- **Numerical methods:** Numerical groundwater flow model building in FORTRAN 90/95 using both Finite Difference and Finite Element methods
- **Field work and planning:** Developed a field plan to measure stream stage and flood wave arrival times and installed sensors
- **Groundwater-surface water modeling:** Building a groundwater- surface water model from historic geologic data and available geospatial data for river, crop and soild data
- **Geospatial analysis:** Analyzing and transforming geospatial data in R, Python, QGIS and ArcGIS with an emphasis on reproducibility through programming in Python and R

RESEARCH EXPERIENCE

Hydrologic Sciences Graduate Group **UC Davis**
Graduate Student Researcher *Aug 2019 to Present*
- Developed HYDRUS 1D models to estimate potential recharge from a managed flooding project
- Installed sensors to capture stream stage and stream wave arrival times
- Developed a basic groundwater model with the Cosumnes River to investigate regional seepage
- Installed various sensors for a recharge project and assisted in soil coring and characterization

Graham Fogg Lab **UC Davis**
Research Assistant *Mar 2018 to Aug 2019*
- Updated and organized continuous groundwater level data
- Managed pressure transducers in the field and install telemetry equipment
- Programmed and plotted data to create short reports on the field site such as evapotranspiration

Thomas Harter Lab **UC Davis**
Research Assistant *Oct 2017 to Mar 2018*
- Researched government websites for state well codes regarding the annular seals of wells
- Organized well codes into a comprehensive spreadsheet
- Created criteria to sort the data based on commonalities

Hydrologic Engineering Center, USACE **Davis**
Research Assistant *Jul, Sep 2017*
- Digitized historical river depth cross sections
- Performed quality control on cross section data
- Created an Excel VBA program to quantify the occurrence of scours at a set depth

EDUCATION

- Master's, Physical Hydrology, University of California Davis, Expected June 2021
- BS, Civil and Environmental Engineering, University of California Davis, 2019

TEACHING AND MENTORING EXPERIENCE

- Spring 2020 - Teaching Assistant for ESM 108 Environmental Monitoring
  - Taught students about the application of Arduinos in environmental monitoring
  - Held office hours to assist students on homework
  - Created two homework assignments from scratch to teach data analysis and excel
- Fall 2019 - Reader for HYD 144 Groundwater Hydrology
  - Held office hours to explain foundational and advanced concepts of groundwater hydrology to undergraduate students
  - Graded student homework assignments and exams

AWARDS

- Jaime Amorocho Memorial Fund Scholarship

CONFERENCE PRESENTATIONS

- California Irrigation Institute Conference 2019: Presented a poster on the use of stream stage and flood wave arrival times to calculate longitudinal streambed seepage variation

PUBLICATIONS

Calderwood, A.J.; Pauloo, R.A.; Yoder, A.M.; Fogg, G.E. Low-Cost, Open Source Wireless Sensor Network for Real-Time, Scalable Groundwater Monitoring. Water 2020, 12, 1066.

OTHER SKILLS

Software Latex/Overleaf, Microsoft Word, Excel, and PowerPoint, AutoCAD
Languages English: Native. Spanish: Advanced writing and intermediate speaking. French: conversational.