ANDREW CALDERWOOD, EIT

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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
- **Field work:** Planning and installing farm field and in-stream channel instrumentation to measure the effects of Flood-MAR and in-stream recharge
- **Groundwater-surface water modeling:** Building groundwater-surface water models from publicly available data sets using Python to improve model adaptability and reproducibility
- **Geospatial analysis:** Analyzing and transforming geospatial data in R, Python, QGIS and ArcGIS with an emphasis on reproducibility through programming in Python and R
- **Numerical methods:** Basic numerical groundwater flow model building with FORTRAN 90/95 using both Finite Difference and Finite Element methods and the ability to make changes to existing sources FORTRAN codes for MODFLOW to test new methods

WORK EXPERIENCE

Larry Walker Associates **Davis**
Groundwater Intern *Nov 2020 to Present*
- Developed a groundwater flow model to create historical and projected water budgets for GSP completion
- Data management and visualization of groundwater level data to inform water level trends and surface water-groundwater interconnection
- Worked with stakeholders to develop groundwater flow model scenarios to test recharge project scenarios
- Stream gaging and installation of field equipment for stream and groundwater monitoring

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 and other various sensors to capture on-farm recharge
- Developed a groundwater-surface water model with the Cosumnes River to investigate regional seepage and floodplain recharge
- Adjusted the base MODFLOW code and recompiled the exeecutable to include an analytical streambed conductance developed by Morel-Seytoux et al.

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

Ph.D. Student in Physical Hydrology **UC Davis**
Hydrologic Sciences Graduate Group *Expected June 2023*
- Specialization: Surface water-groundwater interactions
- Advisors: Laura Foglia and Helen Dahlke

B.S. Civil Engineering **UC Davis**
Department of Civil and Environmental Engineering *Jun 2019*

- Specialization: Water Resources
- Related coursework: ECI 141 Engineering Hydraulics, HYD 144 Groundwater Hydrology, HYD 146 Hydrogeology and Transport, ECI 142 Engineering Hydrology, ECI 146 Water Resources Simulation

TEACHING AND MENTORING EXPERIENCE

- Spring 2020, 2021 - 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

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.

CERTIFICATIONS

State of California Certified **Engineer-in-Training** since June 24, 2020 - Certificate No. EIT 171128

AWARDS

- Jaime Amorocho Memorial Fund Scholarship

CONFERENCE PRESENTATIONS

- Soil Science Society of America Conference 2020: Recorded a slideshow presentation on modeling the effect of levee removal on groundwater recharge that will be available to view online during the conference
- Geological Society of America Conference 2020: Recorded a poster video on modeling the effect of levee removal on groundwater recharge that will be presented during the conference
- 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

OTHER SKILLS

Communication Software Latex/Overleaf, Microsoft Word, Excel, and PowerPoint
Programming Languages Python, R (RStudio), FORTRAN (F90), MATLBAB, and Excel VBA
Professional Software AutoCAD, ArcMap, QGIS, MODFLOW, Hydrus-1D
Languages English: Native. Spanish: Advanced writing and intermediate speaking. French: conversational.