San Bernardino Valley
Water Conservation District
Helping Nature Store Our Water

BOARD OF DIRECTORS SPECIAL MEETING AGENDA

Wednesday, July 24, 2024 – 11:00 a.m.

Location-1630 West Redlands Boulevard, Suite A, Redlands, California

Anyone wishing to listen to or participate in the meeting can join via Zoom:
Call in (669) 900-6833, Meeting ID: 885 6563 1529
To join the Zoom Meeting on https://us06web.zoom.us/j/88565631529

While the District makes every attempt to follow all guidance re COVID-19 safety protocols, the District cannot assure in-person attendees that they will not be exposed to COVID-19 or persons who have been so exposed, and attendees are advised to exercise caution in limiting their own incidences of exposure, particularly those who may be in groups at higher risk of infection, or serious symptoms of COVID-19 if infected.

Note: Copies of staff reports and other documents relating to the items on this agenda are on file at the District office and are available for public review during normal District business hours. New information relating to agenda topics listed, received, or generated by the District after the posting of this agenda, but before the meeting, will be made available upon request at the District office and in the Agenda Package on the District's website. It is the intention of the San Bernardino Valley Water Conservation District to comply with the Americans with Disabilities Act (ADA) in all respects. If you need special assistance with respect to the agenda or other written materials forwarded to the members of the Board for consideration at the public meeting, or if as a participant at this meeting you will need special assistance, the District will attempt to accommodate you in every reasonable manner. Please contact Athena Laroche at (909) 793-2503 at least 48 hours prior to the meeting to inform her of your particular needs and to determine if accommodation is feasible. Please advise us at that time if you will need accommodations to attend or participate in meetings on a regular basis.

CALL TO ORDER
PLEDGE OF ALLEGIANCE
ROLL CALL

1. **PUBLIC PARTICIPATION**

Members of the public may address the Board of Directors on any item that is within the jurisdiction of the Board; however, no action may be taken on any item not appearing on the agenda unless the action is otherwise authorized by Subdivision (b) Section 54954.2 of the Government Code.

2. **ADDITIONS/DELETIONS TO AGENDA**

Section 54954.2 provides that a legislative body may take action on items of business not appearing on the posted agenda under the following conditions: (1) an emergency situation exists, as defined in Section 54956.5; (2) a need to take immediate action and the need for action came to the attention of the District subsequent to the agenda being posted; and (3) the item was posted for a prior meeting occurring not more than five calendar days prior to the date action is taken on the item, and at the prior meeting, the item was continued to the meeting at which action is being taken.

1630 W. Redlands Blvd, Suite A
Redlands, CA 92373
Phone: 909.793.2503
Fax: 909.793.0188
www.sbvwcd.org Email: info@sbvwcd.org

3. **DIVISION 2 INTERVIEW**
   A. Hillary Jenkins, 11:00 a.m. 3

4. **LUNCH BREAK 11:45 A.M.**

5. **RECONVENE 12:15 P.M.**

6. **DIVISION 2 INTERVIEW**
   A. Mark Falcone, 12:15 p.m. 25

7. **ACTION ITEMS**

A. DIVISION 2 APPOINTMENT – 5 Minutes
Presenter: *David Cosgrove*
Recommendation: Review, select, appoint a candidate, administer Oath of Office for vacant Direector's position for Division 2.

B. AMENDMENT TO THE PLUNGE AND OAK CREEK DIVERSIONS AND BASINS FEASIBILITY STUDY PROFESSIONAL SERVICES CONTRACT WITH CASC ENGINEERING – 5 Minutes (M#2039) 29
Presenter: *John Lambie*
Recommendation: Approve the Amendment to Contract Services Agreement for Professional Services for the Active Recharge Transfer Projects (ARTP) Plunge Creek and Oak Creek Diversions and Basins Projects Feasibility Study Support ("Amendment"), and authorize the General Manager to execute an amendment to the professional consultant services agreement in an amount not to exceed $46,300.

8. **ADJOURN MEETING.** The next regularly scheduled Board of Directors Meeting will be on August 14, 2024 at 1:30 p.m., at District Headquarters, 1630 W. Redlands Blvd., Redlands, CA and via Zoom/teleconference.

Dr. Hillary S. Jenkins
Professor of Environmental Studies
Lewis Hall
1200 E. Colton Avenue
Redlands, CA 92374
hillary_jenkins@redlands.edu
909-748-8525

July 17, 2024

San Bernardino Valley Water Conservation District
Board of Directors
1630 West Redlands Blvd. Suite A
Redlands, California 92373

Dear President Henriques-McDonald,

I moved to Redlands during the worst multi-annual drought California has seen in 1200 years. It was the summer of 2014, surface reservoirs were at an all-time low, mandatory water restrictions were in effect, and I was a new Professor at the University of Redlands tasked with teaching field methods in stream hydrology. *How am I going to teach my students about hydrology?!* I found myself asking as I drove up and down the road looking at the dry Santa Ana River Wash. Little did I know then I would craft my professional career around groundwater flux and hydrologic monitoring in the San Bernardino Mountains of the Upper Santa Ana Watershed. This interest and expertise combined with my personal experience as a citizen of District 2 for the past ten years compel me to apply for the position of Director and Board Member at the San Bernardino Valley Water Conservation District.

As a Professor of Environmental Studies at the University of Redlands, I regularly teach courses in Hydrology, Geology, Climate Science, Oceanography, and Environmental Disasters. My research lies at the nexus of Climatology and Hydrology as I use climate data and modeling to understand patterns of water storage and flux in montane meadows and paleoclimate proxies (tree rings) to reconstruct patterns of extreme drought. I currently manage a 68-piezometer network that monitors groundwater changes in threatened meadow ecosystems in the San Bernardino Mountains in collaboration with US Fish & Wildlife, the National Forest Service, the Wildlands Conservancy, and the San Bernardino Mountain Land Trust.

As a result of my teaching and research, I understand how deeply water management and groundwater storage impacts our community. I have been invited to present multiple times at the Redlands Forum, Accelerated Neighborhood Climate Action Series, the University of Redlands Climate Teach-In and Spatial Symposium. I am a Board Member of the Santa Ana Watershed

Symposium Committee and the Headwaters Resiliency Council, and I am a reviewer for the Safe Clean Water Program of Los Angeles.

Given my personal interest in our local community, my professional background, and my passion for teaching, I would be very interested in representing our community by serving as a member of the Board of the San Bernardino Valley Water Conservation District.

Sincerely,

Dr. Hillary Jenkins

HILLARY SANDFORD JENKINS

University of Redlands • Department of Environmental Studies
1200 E. Colton Avenue, Redlands, CA 92373
hillary_jenkins@redlands.edu • 909.748.8525

RESEARCH AREAS

Groundwater Hydrology • Meadow Ecosystem Assessment • Paleoclimatology • Dendrochronology • Isotope Geochemistry • Global Change Research • Remote Sensing

EDUCATION

- **Duke University,** Durham, NC, 2009
  Ph.D., Earth & Ocean Sciences – Paleoclimatology
  Dissertation: *Amazon climate reconstruction using growth rates and stable isotopes of tree ring cellulose from the Madre De Dios Basin, Peru*

- **Wellesley College**, Wellesley, MA, 2004
  B.A., Geology
  Graduated cum laude, received honors in Geology
  Thesis: *Micropaleontology of the Upper Triassic Snyder Quarry, Petrified Forest Formation, North-Central New Mexico*

HONORS & AWARDS

- Hedco Endowed Chair of Environmental Science, *Office of the Provost, University of Redlands, 2023 - Present*
- Career Faculty Fellowship, *Office of Career & Professional Development, University of Redlands, 2023*
- Outstanding Teaching Award Nomination, *Faculty Review Committee, University of Redlands, 2022*
- Outstanding Service Award, *Faculty Review Committee, University of Redlands, 2021*
- Johnston Fellow, *Johnston Center for Integrative Studies, University of Redlands, 2019 – 2020*
- Outstanding Teaching Award, *Faculty Review Committee, University of Redlands, 2018*
- Professor of the Year Nomination, *Mortar Board, University of Redlands, 2017*
- ABLConnect Learning Innovator Prize, *Harvard Initiative for Learning & Teaching (HILT), 2014*
- Harvard Certificate of Teaching Excellence, *Derek Bok Center for Teaching & Learning, 2013 & 2014*
- Estwing Teaching Assistant of the Year, *Duke University, Dept. of Earth & Ocean Sciences, 2009*
- Harvey Fellow, *Harvey Fellows Program, Mustard Seed Foundation, 2006 – 2008*

ACADEMIC EXPERIENCE

Professor & Hedco Chair, Department of Environmental Studies, University of Redlands, 2022 – Present

- Teach Senior Capstone, Honors Research, Climate Science, Great Environmental Disasters, Hydrology, Geology, and Oceanography to classes averaging 25 students. Develop curriculum and assessment materials and advise and mentor students in the Environmental Studies program.

- Current Research Projects: California Mountain Meadow Hydrology, Pollution & Tree Growth, Fire & Carbon Loss in the San Bernardino National Forest, Windthrow Disturbance in the Amazon Basin.

Associate Professor, Department of Environmental Studies, University of Redlands, 2016 – 2022

- Chaired Environmental Studies Program, developed curriculum and assessment materials and advised and mentored students in the Environmental Studies program. Taught Climate Science, Design Studio, Hydrology, Oceanography, Advanced Geology Seminar, Geology of Iceland to classes averaging 25-45 students.

Assistant Professor, Department of Environmental Studies, University of Redlands, 2014 – 2016

- Taught Great Environmental Disasters, Hydrology, Geology, Tropical Rainforests: The Amazon, the Andes & the Inca to classes averaging 35 students. Advised and mentored students in the Environmental Studies program.

Preceptor, Earth & Planetary Sciences Department, Harvard University, 2010 – 2014

- Taught laboratory sections and lecture content for courses across the spectrum of Earth Sciences.
- Created curriculum and laboratory content for undergraduate and graduate level courses.
- Hired, trained, and evaluated departmental teaching fellows and teaching assistants.

Adjunct Professor, Environmental Sciences & Studies Department, Stonehill College, 2013 – 2014

- Taught Environmental Geology course to 24 students.
- Led course field trip and designed guidebook and field exercises to study the geology of Cape Cod.

Laboratory Instructor, Earth & Ocean Sciences Department, Duke University, 2004 – 2009

- Created and taught weekly laboratories, lectures and review sessions in Mineralogy, Historical Geology, Physical Geology, Oceanography and Paleoclimatology.

Contract Editor, American Journal Experts, Durham, NC, 2006 – 2008

- Edited scientific manuscripts for a variety of journals prior to formal review process.

Research Intern, New Mexico Museum of Natural History & Science, Albuquerque, NM, 2002 – 2003

- Analyzed, identified and catalogued microfossils from the Snyder Quarry, Northern New Mexico.
- Organized docents and managed museum special events.

FIELD COURSES

- **Wetlands Assessment**, Big Bear Valley, California (Fall 2022 - Present), University of Redlands

  Design and lead multiple day trips with 25+ research students to monitor the vegetation, soil, mammal habitat, and stream and groundwater hydrology of threatened meadow ecosystems in the San Bernardino National Forest. Trips include data extraction from a 68-piezometer network installed across 5 meadows in the SBNF.

- **Geology of the Grand Canyon**, Arizona (Spring 2024), University of Redlands

  Designed and led a 3 day camping trip to study the stratigraphy and geologic history of the southern rim of the Grand Canyon with over 30 participants.

- **Meadow Hydrology**, Big Bear Valley, California (Fall 2018), University of Redlands

  Designed and led 2 day field trip with 25 students to monitor the hydrology and paleoclimatic history of endangered meadows in the San Bernardino National Forest.

- **The Geology of Iceland**, Iceland (Spring 2017), University of Redlands
  Created, designed, and taught 2 week course to study the geology, glaciology, hydrology, and geothermal energy of Iceland.

- **Tropical Rainforests: The Amazon, the Andes & the Inca**, Peru (Spring 2015), University of Redlands
  Created, designed and led a 4 week trip to the Amazon rainforest and Andean Cloud Forest to study the ecology, climatology, and culture of these two distinct regions.

- **Geology of the Grand Canyon**, Arizona (Spring 2015), University of Redlands
  Designed and led a 3 day camping trip to study the stratigraphy and geologic history of the northern rim of the Grand Canyon with over 30 participants.

- **Environmental Hazards of Southern California**, California (Fall 2014), University of Redlands
  Designed and led daylong field trip with 15 students to study the San Andreas Fault, Landslides in the Cajon Pass, the Rock Candy Mountains, and the Salton Sea.

- **Geology & Biology of the Channel Islands**, California (Fall 2015), University of Redlands
  Designed and led daylong field trip with 18 first year seminar students to study the formation of sea caves and arches and the kelp forests off the shores of Santa Cruz Island.

- **Oceanography Trawling Trip**, California (Fall 2015), University of Redlands
  Designed and led two daylong field trip to examine the biology, geology, chemistry, and physical behavior of the California Current.

- **Tectonics of the Northern Appalachians**, Vermont (Fall 2013), Harvard University
  Assisted during 3 day field trip to study the structural geology of the northern Appalachians with 19 course participants.

- **The Geologic Environments of Cape Cod**, Cape Cod, Massachusetts (Fall 2013), Stonehill College
  Designed and led 24 undergraduates on a day trip to the Cape Cod to examine the Sandwich terminal moraine, outwash plain, and salt marsh wetland environments of the peninsula.

- **Seismic Interpretation in Fold-and-Thrust Belts**, Alberta, Canada (Summer 2013), American Association of Petroleum Geologists
  Assisted as instructor, driver, and field station manager during 7 day field trip to the Southern Canadian Rocky Mountain Foreland to study the structural geology of the Canadian Rockies with 21 course participants.

- **The Geology of Hawaii,** Hawaii (Summer 2011), Harvard University
  Designed and led 40 undergraduates on a 10 day trip to Hawaii's big island to study the formation of hot spot volcanoes, basaltic rheology, seismology of Kilauea, the observatories atop Mauna Kea and Mauna Loa, and the mineralogy of Hawaiian beaches.

- **Atlantic Sailing Trip**, Woods Hole, Massachusetts (Summer 2010), Sea Education Association
  Co-led trip as oceanography instructor and shift leader during 6 day sailing trip in the Atlantic Ocean with 22 undergraduates.

- **The Tectonic Evolution of the Appalachians**, Eastern NY and Western MA (Annually 2010 – 2014), Harvard University
  Assisted and co-led 3 day weekend trip with 35 students to study the tectonic history and evolution of the Taconic and Acadian orogenies.

• **Coal, Gas, and Mineral Resources**, Northeastern Pennsylvania and Northern New Jersey (Bi-annually 2011 – 2014), Harvard University

Co-led 3 day weekend trip with 60 students to study the surface and subsurface coal mines, natural gas rigs, and acid-mine drainage and pollution issues.

• **Dendrochronology of Pine Forests**, Southern Pines, North Carolina (Spring 2008), Duke University

Designed and led daylong field trip with 15 students to study the ecology and climatology of the Weymouth Woods Pine Stand.

• **The Geology of Yellowstone**, Yellowstone National Park, Wyoming (Fall 2007), Duke University

Co-led 9 day field trip with 15 students to study the ecology and geology of the national park.

GRANTS & FELLOWSHIPS

2024	$300,000	**Installing Stormwater Management Features on the University of Redlands Campus**, CASC Environmental Engineering, *in prep*
	$115,000	**SolUR: Increasing Student Engagement in the Installation of a 1.7MW Photovoltaic System on the University of Redlands Campus**, EBSCO Solar, not funded
	$3210	**Hydrologic Monitoring at Little Metcalf (Aspen Glen) Meadow,** Inland Empire Resource Conservation District
2023	$1,000,000	**Establishing a Hydrologic Monitoring Network & Data Repository for the Upper Santa Ana Watershed**, San Bernardino Valley Municipal Water District, deferred
	$19,890	**Monitoring the Hydrology of Bluebird Springs Meadow, Big Bear Valley**, California Department of Fish & Wildlife-Reclamation Funds, deferred
2022	$1000	**Career Faculty Fellowship**, Office of Career & Professional Development, University of Redlands
2021	$65,000	**Monitoring the Hydrology of Threatened Meadow Ecosystems in the San Bernardino Mountains**, US Fish & Wildlife Service Recovery-Endangered Species Conservation Grant (F21AC02886-00)
2020	$5000	**Flying Laboratory - A multi-faceted study at Bearpaw** Faculty Research Grant, Academic Affairs, University of Redlands
2019	$2900	**Fire in the Forest: Quantifying Recovery from Fire in the San Bernardino National Forest,** Faculty Research Grant, Academic Affairs, University of Redlands

	$4000	**EnVRonment: Immersive Environmental Studies with Virtual Reality,** Technology Development Grant, Task Force for Online Learning, University of Redlands
2018	$312,500	**Miles High Chemistry: Exciting Undergraduate Students About Geoscience Through Spatial Research on Endocrine Disruptors in Remote Glacier Deposits,** National Science Foundation, Improving Undergraduate STEM GEOPATHS (NSF17-574), not funded
2017	$2000	**Mapping Outside the Lines: Gender & Disciplinarity in GIS**, Multidisciplinary Faculty Seminar, Office of the Provost, University of Redlands.
2015	$23,000	**Mobilizing Science: Developing Field-Based Spatial Applications,** Spatial Communities of Practice Grant, Center for Spatial Studies, University of Redlands
	$2975	**Assessing the Hydrologic Health of Montane Meadows**, Faculty Research Grant, Academic Affairs, University of Redlands
	$3960	**Shifting Sands and Turning Tides: Using 3D Visualization Technology to Shape the Environment for Redlands Undergraduates,** Technology Development Grant, Task Force for Online Learning, University of Redlands
	$2959	**Coast Live Oak Preservation Grant**, Office of the President, University of Redlands
2014	$767,323	**Capturing Carbon: An Answer to Long-standing Uncertainties in Amazon Forest Biomass Estimates using LiDAR, Landsat and in situ Field Measurements,** Carbon Monitoring System Grant (NNH14ZDA001N-CMS), NASA, 2014, not funded
2006	$45,000	**Harvey Fellowship**, Harvey Fellows Program, Mustard Seed Foundation
2003	$4500	**Sara Langer Award for Research in Geology**, Wellesley College
2002	$3000	**Parents Fellowship**, Parents Internship Program, Wellesley College
2001	$3000	**Service Opportunity Stipend**, Wellesley College

FIELD RESEARCH LOCALITIES

Mountain Meadow Ecosystems, Southern California (Fall 2015 – Present), University of Redlands

- Oversee a 68 piezometer hydrologic monitoring network wells across multiple meadow localities within the Santa Ana Upper Watershed.

San Bernardino National Forest, Southern California (Fall 2014 – Present), University of Redlands

- Coordinate and supervise tree coring and sampling of Ponderosa and Jeffrey Pine trees at multiple locations within the forest.

Iquitos, Amazonian Lowlands, northeastern Peru (Spring 2015), University of Redlands

- Coordinated and supervised tree coring and sampling of a variety tropical tree species within the Puerto Almendras Field Locality.
- Worked with the National University of the Peruvian Amazon to manage student field data collection in both Spanish and English.
- Manage field site on an ongoing basis in cooperation with UNAP.

Wayqecha, Andean Highlands, central Peru (Spring 2015), University of Redlands

- Collected meteorological measurements of the cloud forest.
- Coordinated coring of tree species in and around the Wayqecha Biological Research Station.

Puerto Maldonado, Amazonian Lowlands, southeastern Peru (Summer 2007), Duke University

- Systematically identified and sampled over 60 tropical hardwood tree species within 20+ field sites.
- Created a dendrochronologic sampling to study the rainfall/drought variability in lowland tropics.

Ponderosa Pine Stand, Coronado Forest, southern Arizona (Summer 2007), Laboratory of Tree Ring Research, University of Arizona

- Cored and measured Ponderosa Pine trees for dendrochronological and climatological reconstructions.

Petersen Quarry, Morrison Formation, west-central New Mexico (Summer 2006), New Mexico Museum of Natural History & Science

- Removed overburden, identified and excavated dinosaur and reptilian fossils including mandibular and orbital processes.

Snyder Quarry, Petrified Forest, north-central New Mexico (Summer 2005, 2006, 2007), New Mexico Museum of Natural History & Science

- Identified and excavated numerous sphenosuchidae skulls including mandibular and orbital processes.

Bol'shoi Koty Biological Research Station, Lake Baikal, southern Siberia (Summer 2003), Irkutsk University

- Collected and identified zooplankton and fish samples from Lake Baikal.
- Compiled detailed analyses of vertical migration in golmyanka and omul fish species.

PUBLICATIONS

2024 **Jenkins, H.,** Krantz, T., Crawford, M., Dluzak*, G., and Dimicco*, A., 2024, Hydrologic Restoration of Bluff Meadow. *Atmosphere*, in prep.

2023 **Jenkins, H.S.**, 2023, Groundwater Storage Efficiency in Threatened Meadow Ecosystems of the Upper Santa Ana Watershed. *US Fish & Wildlife Report*, 7.

2022 **Jenkins, H.S.**, 2022, Monitoring the Hydrology of Threatened Meadow Ecosystems in the San Bernardino Mountains. *US Fish & Wildlife Report*, 4.

2021 **Jenkins, H.S.,** 2021, Air Pollution and Climate Drive Annual Growth in Ponderosa Pine Trees in Southern California. *Climate,* 9(5):82. https://doi.org/10.3390/cli9050082

Urquiza Muñoz, J.D., Magnabosco Marra, D., Negrón-Juarez, R.I., Tello-Espinoza, R., Alegría-Muñoz, W., Pacheco-Gómez, T., Rifai, S.W., Chambers, J.Q., **Jenkins, H.S.,** Brenning, A., and Trumbore, S.E., 2021, Recovery of Forest Structure Following Large-Scale Windthrows in the Northwestern Amazon. *Forests, 12*, 667. https://doi.org/10.3390/f12060667

2019 **Jenkins, H.,** and Romack*, E., 2019, Modeling Hydrologic Change in a Californian Meadow: Lessons following the 2012-2015 Drought. *United States Forest Service Report*, 12.

2017 Negron-Juarez, R., **Jenkins, H.,** Raupp, C., da Silva Dias, M., and da Silva Dias, P., 2017, Unexpected high frequency of Southerly Squall Lines In Amazonia. *Atmosphere*, 8, 28. https://doi.org/10.3390/atmos8020028

2016 Zeng, H., Lu, T., **Jenkins, H.,** Negrón-Juárez, R.I., and Xu, J., 2016, Assessing Earthquake-Induced Tree Mortality in Temperate Forest Ecosystems: A Case Study from Wenchuan, China. *Remote Sensing,* 8(3), 252. https://doi.org/10.3390/rs8030252

2015 Cheng, F., Guo, Z., **Jenkins, H.S.,** Fu, S., and Cheng, X., 2015, Initial rupture and displacement on the Altyn Tagh fault, northern Tibetan Plateau: Constraints based on residual Mesozoic to Cenozoic strata in the western Qaidam Basin: Geosphere, v. 11. https://doi.org/10.1130/GES01070.1

2013 **Jenkins, H.S.**, Baker, P.A., and Negron Juarez, R.I., 2013, Extreme drought events in Amazonia revealed from tree ring records in Borma, L. S.; Nobre, C. (Org.) Secas na Amazônia: causas e consequências. São Paulo: Oficina de Textos.

2012 Heckert, A.B., **Jenkins, H.S.,** Lucas, S.G., and Hunt, A.P., 2012, Mandibles of Juvenile Phytosaurs (Archosauria: Crurotarsi) From the Upper Triassic Chinle Group of Texas and New Mexico, USA, Journal of Vertebrate Paleontology.

2009 **Jenkins, H.S.,** 2009, Amazon Climate Reconstruction Using Growth Rates and Stable Isotopes of Tree Ring Cellulose from the Madre De Dios Basin, Peru. Duke University.

2005 Heckert, A.B., and **Jenkins, H.S.,** 2005, The Microvertebrate Fauna of the Upper Triassic (Revueltian) Snyder Quarry, North-Central New Mexico, 2005, New Mexico Geological Society, 56th Field Conference Guidebook, Geology of the Chama Basin, p. 319-334.

2004 **Jenkins, H.S.,** and Heckert, A.B., 2004, Revueltian (early-mid Norian) microvertebrates from the Upper Triassic Snyder quarry, Painted Desert Member, Petrified Forest Formation, north-central New Mexico: Journal of Vertebrate Paleontology, v. 24 (supplement to no. 3), p. 75A.

Heckert, A.B., **Jenkins, H.S.,** Lucas, S.G., and Mutter, R.J., 2004, The Microvertebrate fauna of the Upper Triassic Snyder quarry, from the Painted Desert Member of the Petrified Forest Formation (Revueltian), north-central New Mexico: New Mexico, *Geology*, v. 26, p. 75.

Jenkins, H.S., 2004, Rediscovering the Gila: America's Oldest National Wilderness Area, Rural Property Bulletin (February Edition), p. 16-17.

Jung, J., Hojnowski, C., **Jenkins, H.,** Ortiz, A., Brinkley, C., Cadish, L., Evans, A., Kissinger, P., Ordal, L., Osipova, S., Smith, A., Vredeveld, B., Hodge, T., Kohler, S., Rodenhouse, N. and Moore, M., 2004, Diel vertical migration of zooplankton in Lake Baikal and its relationship to body size. in A.I. Smirnov and L.R. Izmest'eva (eds) Ecosystems and Natural Resources of Mountain Regions, p. 131-140. Proceedings of the first international symposium on Lake Baikal: The current state of the surface and underground hydrosphere in mountainous areas, "Nauka", Novosibirsk, Russia.

Jenkins, H.S., and Heckert, A.B., 2004, Revueltian (earl-mid Norian) microvertebrates from the Upper Triassic Snyder quarry, Painted Desert Member, Petrified Forest Formation, north-central New Mexico: Geological Society of America Abstracts with Programs, v. 36 (5), p. 423.

PRESENTATIONS

2024 **Jenkins, H.S.,** 2024, Buffering Against Whiplash: Groundwater Retention and Storage Capacity in Meadows of the Upper Santa Ana Watershed, Santa Ana River Science & Conservation Symposium, ESRI, Redlands, CA.

Jenkins, H.S., 2024, Climate Whiplash: How Extremes Have Become the Steady Drum Beat of Climate Change in Our Time, Climate Teach-In, Redlands, CA.

2023 **Jenkins, H.S.,** 2023, Climate Projections for Southern California, Climate Teach-In, Redlands, CA.

Jenkins, H.S., 2023, Beneath the Surface: The Hydrology of Threatened Meadow Ecosystems in the Upper Santa Ana Watershed, Santa Ana River Science & Conservation Symposium, ESRI, Redlands, CA.

Dimicco*, A., and **Jenkins, H.,** 2023, Hydrologic Variability of Meadows in the San Bernardino Mountains, Santa Ana River Science & Conservation Symposium, ESRI, Redlands, CA.

Wesel*, M., and **Jenkins, H.,** 2023, Examining the Vegetative Health of Meadows Using Landsat and NDVI, Santa Ana River Science & Conservation Symposium, ESRI, Redlands, CA.

2022 Dimicco*, A., Smith*, K., and Jenkins, H., 2022, Characterizing the Hydrologic Variability of Meadows in the San Bernardino Mountains, Southern California Conference on Undergraduate Research, Pepperdine University - Malibu, CA.

Hernandez, F., and **Jenkins, H.,** 2022, The Lake Fire: Wildfire's Impact on Forest Regrowth and Carbon Sinks in the San Bernardino National Forest, ESRI Users Conference, San Diego, CA.

Jenkins, H.S., 2022, California Raining: Past, Present, & Future, Climate Teach-In, Redlands, CA.

Novak-Murano*, R., and **Jenkins, H.,** 2022, Who Grows There? Analyzing Montane Meadow Vegetation as an Indicator of Hydrologic Stress, Southern California Conference on Undergraduate Research, Pepperdine University, Malibu, CA.

Rosas Perez*, P., and **Jenkins, H.,** 2022, More Than Just Dirt!: The Role of Soil in Meadow Hydrological Health, Southern California Conference on Undergraduate Research, Pepperdine University, Malibu, CA.

Wesel*, M., and **Jenkins, H.,** 2022, From the Skies: A Look at Vegetative Health of Meadows Over Time Using Landsat and NDVI, Southern California Conference on Undergraduate Research, Pepperdine University, Malibu, CA.

2021 **Jenkins, H.S.,** 2021, The Impact of Air Pollution on Ponderosa Pine Growth in the San Bernardino National Forest, American Association of Geographers, Seattle, WA.

2020 **Jenkins, H.,** Romack*, E., Waldo*, A., Ferguson*, D., and Munding-Becker*, M., 2020, Measuring and Modeling Groundwater Fluctuation in Two Montane Meadows in Southern California, American Geophysical Union, San Francisco, CA.

Jenkins, H.S., 2020, Using Field Data & Remote Sensing to Estimate Forest Carbon Loss Following Fire, ESRI Users Conference, San Diego, CA.

Urquiza Muñoz, J.D., Magnabosco Marra, D., Negrón-Juarez, R.I., Tello-Espinoza, R., Alegría-Muñoz, W., Pacheco-Gómez, T., Rifai, S.W., Chambers, J.Q., **Jenkins, H.S.,** Brenning, A., and Trumbore, S.E., 2020, Forest structure and biomass recovery from windthrows in the Northwestern Amazon, American Geophysical Union, San Francisco, CA.

2019 Altieri*, G., and **Jenkins, H.,** 2019, From ABC to AGB: Estimating the Trajectory of the San Bernardino National Forest, Southern California Conference on Undergraduate Research, California State University - San Marcos, CA.

Ferguson*, D. and **Jenkins, H.,** 2019, Water Quality in Montane Meadows, Southern California Conference on Undergraduate Research, California State University - San Marcos, CA.

Rickard*, T., and **Jenkins, H.,** 2019, Fire & Soil: Assessing Recovery, Southern California Conference on Undergraduate Research, California State University - San Marcos, CA.

2018 Negron-Juarez, R., Marra, D., **Jenkins, H.,** Aleixo, I., Barbosa, A., Derroire, G., Holm, J., Herault, B., Retushauser, E., Burban, B., Bonal, D., Christianson, D., Faybishenko, B., Detto, M., Araujo, A., Peterson, C., Lima, A., Higuchi, N., Riley, W., and Chambers, J.,

2018, Tree mortality and Extreme Rainfall in the Amazon, American Geophysical Union, Washington D.C.

Jenkins, H., Belcon, A., Brandes, J., Higgins, S., Howard, N., Larsen, L., and Lewis, V., 2018, Mapping Outside the Lines: Gender & Disciplinarity in GIS, Our House, University of Redlands, Redlands, CA.

2017 **Jenkins, H.S.,** 2017, Mapping Drought in Southern California, ESRI Users Conference, San Diego, CA.

Jenkins, H.S., and Dahms-May*, S.M., 2017, Tales Trees Tell: Using Tree Rings to Map Pollution & Drought in the AR Sandbox, University of Redlands Spatial Research Symposium, Redlands, CA.

2016 **Jenkins, H.S.,** 2016, Spatial Sciences in the Field, University of Redlands Spatial Open House, Redlands, CA.

Jenkins, H.S., 2016, Shifting Sands and Turning Tides: Using 3D Visualization Technology to Teach Environmental Science, University of Redlands Technology Showcase, Redlands, CA.

Jenkins, H.S., and *Dahms-May, S.M., 2016, Augmenting Reality to Teach Environmental Science, GIS Day, University of Redlands, Redlands, CA.

2015 **Jenkins, H.,** and Brandes, J., 2015, A Tale of Two Counties: The Economic Impact of Drought on California's Agricultural Sector, ESRI Users Conference, San Diego, CA.

Jenkins, H.S., 2015, Shifting Sands and Turning Tides: Using 3D Visualization Technology to Shape the Environment for Undergraduate Students, Task Force for Online Learning Faculty Projects' Showcase, University of Redlands, Redlands, CA.

*Romack, E., and **Jenkins, H.,** 2015, Assessing the Hydrologic Health of California's Mountain Meadows, Southern California Conference on Undergraduate Research, Claremont, CA.

*Dahms-May, S.M., and **Jenkins, H.S.,** 2015, Tree Rings as a Record of Climate & Pollution in Southern California, Southern California Conference on Undergraduate Research, Claremont, CA.

*Trikha, I., and **Jenkins, H.,** 2015, Deforestation & Climate in Northwestern Amazonia: A Tree Ring Analysis of Four Tropical Tree Species, Southern California Conference on Undergraduate Research, Claremont, CA.

2014 **Jenkins, H.,** Gant, R., and Hopkins, D., 2014, Shifting Sands and Turning Tides: Using 3D Visualization Technology to Shape the Environment for Undergraduate Students American Geophysical Union, San Francisco, CA.

2010 **Jenkins, H.S.,** and Baker, P.A., 2010, Extreme Drought Events Revealed in Amazon Tree Ring Records, American Geophysical Union, San Francisco, CA.

2009 **Jenkins, H.S.,** 2009, The Interface of Science & Education: A Reflection, The Hotchkiss School, Salisbury, CT.

2008 **Jenkins, H.S.,** and Baker, P.A., 2008, Oxygen Isotopes in Tree Rings: A 345 Year Record of Precipitation in Amazonia, American Geophysical Union, San Francisco, CA.

2006 **Jenkins, H.,** Baker, P., and Madden, R., 2006, Reconstructing Paleovegetation in Mid-Miocene Tropical South America: An Analysis of Carbon and Oxygen Stable Isotopes From Toxodontid Tooth Enamel, American Geophysical Union, San Francisco, CA.

Jenkins, H.S., 2006, Experiencing Geoscience: Critical Thinking Through Undergraduate Research, Geological Society of America, Denver, CO.

2005 **Jenkins, H.,** and Pratson, L., 2005, Evidence for Endothermy in Pterosaurs based on Flight Capability Analyses, American Geophysical Union, San Francisco, CA.

2004 **Jenkins, H.S.,** and Heckert, A.B., 2004, Revueltian (Early-Mid Norian) Microvertebrates from the Upper Triassic Snyder Quarry, Painted Desert Member, Petrified Forest Formation, North-Central New Mexico, Geological Society of America, Denver, CO.

Jenkins, H.S., and Heckert, A.B., 2004, The Microvertebrate Fauna of the Upper Triassic Snyder Quarry, from the Painted Desert Member of the Petrified Forest Formation (Revueltian), North-Central New Mexico, Society of Vertebrate Paleontology, Denver, CO.

Jenkins, H.S., 2004, The Microvertebrate Fauna of the Upper Triassic Snyder Quarry, North-Central New Mexico: Description and Paleoecologic Reconstruction, Ruhlman Conference, Wellesley College, Wellesley, MA.

LABORATORY MANUALS

2023 **Jenkins, H.S.,** 2023, Climate Science Demonstrations & Laboratory Exercises
Prepared for Environmental Studies 433, University of Redlands, 35 p.

Jenkins, H.S., 2023, Field Methods in Hydrology
Prepared for Environmental Studies 391, University of Redlands, 119 p.

2022 **Jenkins, H.S.,** 2022, A Geologist's Guide to Southern California: A Revised Manual
Prepared for Environmental Studies 290, University of Redlands, 98 p.

2021 **Jenkins, H.S.,** 2021, An Introduction to the Oceans
Prepared for Environmental Studies 392, University of Redlands, 104 p.

2020 **Jenkins, H.S.,** 2020, Applications in Climate Science

Prepared for Environmental Studies 433, University of Redlands, 58 p.

Jenkins, H.S., 2020, Oceanography: A Revised Manual
Prepared for Environmental Studies 392, University of Redlands, 92 p.

Jenkins, H.S., 2020, A Geologist's Guide to the Field: A Revised Manual
Prepared for Environmental Studies 290, University of Redlands, 102 p.

2018 **Jenkins, H.S.,** 2018, Abrupt Climate Change Technical Laboratory Manual
Prepared for Environmental Studies 250, University of Redlands, 36 p.

2017 **Jenkins, H.S.,** 2017, Structural Geology & Tectonics
Prepared for Environmental Studies 430, University of Redlands, 22 p.

2016 **Jenkins, H.S.,** 2016, Applications of Environmental Hydrology
Prepared for Environmental Studies 391, University of Redlands, 104 p.

2014 **Jenkins, H.S.,** 2014, Great Environmental Disasters Technical Laboratory Manual
Prepared for Environmental Studies 205, University of Redlands, 107 p.

2013 **Jenkins, H.S.,** 2013, Physical Geology Technical Laboratory Manual, prepared for Environmental Science 295, Stonehill College, 60 p.

2012 **Jenkins, H.S.,** 2012, Introduction to the Fluid Earth Technical Laboratory Manual, prepared for Earth & Planetary Sciences 22, Harvard University, 43 p.

2010 **Jenkins, H.S.,** 2010, Introduction to the Solid Earth Technical Laboratory Manual, prepared for Earth & Planetary Sciences 21, Harvard University, 204 p.

FIELD GUIDEBOOKS

2024 **Jenkins, H.S.,** 2024, *Revised* Field Guide to the Geology of the Grand Canyon, 27 p.

2023 **Jenkins, H.S.,** 2023, Stream Gauging the Mill Creek, 19 p.

Jenkins, H.S., 2023, Flooding, Hydrographs & The Seven Oaks Dam, 24 p.

2022 **Jenkins, H.S.,** 2022, The San Andreas Fault & the Devil's Punchbowl, 14 p.

Jenkins, H.S., 2022, Marine Transgressions & Regressions, 17 p.

2020 **Jenkins, H.S.,** 2020, *Revised* Field Guide to the Geology of Joshua Tree, 12 p.

Jenkins, H.S., 2020, Mapping the San Andreas Fault, 9 p.

2019 **Jenkins, H.S.,** 2019, A Hydrologist's *Revised* Guide to Stream Gauging, 16 p.

Jenkins, H.S., 2019, Coring Pine Trees in Southern California, 14 p.

2017 **Jenkins, H.S.,** 2017, Field Guide to the Geology of Iceland, 80 p.

Jenkins, H.S., 2017, A Guide to Meadow Assessment & Restoration, 23 p.

2015 **Jenkins, H.S.,** 2015, Field Guide to the Geology of the Grand Canyon, 12 p.

Jenkins, H.S., 2015, The Amazon, The Andes & The Inca, 211 p.

Jenkins, H.S., 2015, Field Guide to the Geology of Cape Cod, 48 p.

2014 **Jenkins, H.S.,** 2014, Environmental Hazards of Southern California, 17 p.

2013 **Jenkins, H.S.,** 2013, Squantum Head & The Boston Bay Group, 20 p.

2011 **Jenkins, H.S.,** 2011, The Geology of Hawaii, 97 p.

INVITED TALKS

2024 • Climate Teach-In, *Climate Whiplash: How Extremes Have Become the Steady Drum Beat of Climate Change in Our Time*, University of Redlands, March, 2024.

• Redlands Forum, *Tipping Points: Climate Projections & Economic Possibilities*, ESRI, Redlands, CA, February, 2024.

2023 • Ojai Valley School, *Science Rocks! Opportunities in STEM at the University of Redlands*, November, 2023.

• Environmental Studies Introductory Course, *Paleoclimate Proxies and the Greenhouse Effect*, University of Redlands, October, 2023.

• Climate Teach-In, *Climate Projections for Southern California*, University of Redlands, March, 2023.

2022 • Accelerated Neighborhood Climate Action Series, *Where is the Water: A Global Perspective*, The Contemporary Club, March, 2022.

• Climate Teach-In, *California Raining: Past, Present & Future*, University of Redlands, March, 2022.

2021 • First Year Journey, *The Geology of Zion*, University of Redlands, August, 2021.

• Bedford Cable News, *New Hampshire Granite*, Bedford, NH, July, 2021.

• Politicization of Climate, *The Climate Crisis*, Johnston Course, University of Redlands, January, 2021.

2020

• Charles E. Smith Jewish Day School, *An Oceanography Primer*, Rockville, MD, August, 2020.

2019

• Torch Club, *Whose Fault is it Anyway? Earthquakes in Southern California*, Redlands, CA, April, 2019.

• First Year Journey, *Zion: A History*, University of Redlands, August, 2019.

2018

• First Year Academic Experience, *Earthquake Hazards & GIS*, University of Redlands, August, 2018.

2017

• Turbulent Futures Seminar Series, *Water and Climate Change in Times of Crisis*, University of California Riverside, May, 2017.

• Across the Great Divide Series, *Ethics, Inequality and the Environment*, Banta Center for Business, Redlands, CA, March, 2017.

• Environmental Studies Senior Capstone Course, *Eucatastrophe*, University of Redlands, February, 2017.

• Virginia C. Hunsaker Teaching Program, *Defining Truth, Engaging Evidence and Confronting Alt-Facts,* University of Redlands, February, 2017.

2016

• Redlands Forum, *Drought, Water, Climate Oh My! The Future in Southern California*, ESRI, Redlands, CA, September, 2016.

• Introduction to Spatial Thinking, *Earthquake Hazard*, University of Redlands, November, 2016.

• Lentan Series, *Where is the Water?,* Redlands United Church of Christ, Redlands, CA, March, 2016.

2015

• Faculty Club Forum, *Where is the Water? Patterns of Precipitation in Tropical & Temperate Forest Ecosystems,* University of Redlands, October, 2015.

• National University of the Peruvian Amazon (UNAP), *Un Cuento Sobre Árboles: Reconstrucciones Climáticas de la Cuenca del Amazonas,* Iquitos, Peru, May 2015.

• Johnston First Year Seminar Series, *Making & Unmaking Sense of Nature*, University of Redlands, September, 2015.

• Introduction to Spatial Thinking, *Earthquakes & Flash Flooding*, University of Redlands, October, 2015.

• Environmental Nonfiction, *Writing in the Sciences*, University of Redlands, March, 2015.

• Environmental Studies Senior Capstone Course, *Research in Paleoclimatology & Hydrology*, University of Redlands, September, 2015.

• Summer Bridge Program, *Bringing the field into the classroom*, University of Redlands, July, 2015.

2014

- Associated Students of the University of Redlands (ASUR), *Drought in California*, University of Redlands, October, 2014.
- Hugging Trees and Kissing Frogs, A First Year Seminar, *Introduction to Dendroclimatology*, University of Redlands, November, 2014.
- Introduction to Environmental Studies, *Groundwater Issues in Southern California*, University of Redlands, November, 2014.

CREATIVE ARTIFACTS

Coast Live Oak Slab, April, 2019.

- Exhibit on display in Armacost Library at the University of Redlands, a 6 foot diameter, 4 inch thick Oak Slab from a tree that grew in the University of Redlands quad for over 80 years.
- Sanded, treated, preserved, and dendrochronologically dated and pinned tree with important years in the University of Redlands history.

Augmented Reality Sandbox, November, 2014.

- Built and installed a real-time sandbox simulation of topography and virtual water in the Paleoclimatology Lab at the University of Redlands.

PRESS

2022

- *Climate Change in Redlands*, Redlands Community News, Redlands, CA, September, 2022.

2021

- *New Hampshire Granite*, Bedford Cable News, Bedford, NH, July, 2021.
- *Pollution & Pine Trees*, Earth Day Feature, Redlands Bulldog Blog, April, 2021.

2020

- *Virtual Commencement Ceremonies*, Redlands Bulldog Blog, April, 2020.

2019

- *University of Redlands celebrates a decade of Tree Campus USA recognition*, Newswise, July, 2019.
- *A Monument to the Passage of Time*, Redlands Bulldog Blog, April, 2019. https://www.redlands.edu/bulldog-blog/?au[0]=Hillary%20Jenkins
- *Faculty technology grants encourage academic innovation*, Redlands Bulldog Blog, October, 2019. https://www.redlands.edu/bulldog-blog/2019/october-2019/faculty-technology-grants-encourage-academic-innovation/

2017

- *If a Tree Falls in the Amazon*, Department of Energy Science Highlights, June, 2017. https://science.energy.gov/ber/highlights/2017/ber-2017-06-b/
- *Harvey Fellows Featured Scientist*, Harvey Fellows Newsletter, Summer Issue, May, 2017.
- *California Receives Massive Rainfall, Drought Remains*, Redlands Bulldog Blog, February, 2017.

2016 • *The Jenkins Lab for Innovative Science*, University of Redlands Development Office Promotional, December, 2016.

• *Summer Science Research Program Promotional Video Series*, University of Redlands Development Office, February, 2016.

• *Dr. Jenkins Studies California's Drought with Research Students*, Och Tamale article by Catherine Garcia, February, 2016.

• *Unique Faculty Offices*, Och Tamale article by Judy Hill, February, 2016.

2015 • *The 17th Karmapa visits University of Redlands Paleoclimatology Lab*, Fox News highlight by Erin Waldner, March, 2015.

COMPUTER SKILLS

Programming Languages:	• Matlab • R
Mapping Software:	• ArcGIS
Statistical Software:	• Analyseries • SPSS
Desktop Applications:	• Adobe Photoshop • Adobe Illustrator • Microsoft Office
Tree Ring Programs:	• ARSTAN • COFECHA • YUX • CASE

SERVICE TO STUDENTS

Summer Science Research Advisor, University of Redlands, 2015 – Present.

- Mentor 2-6 students each summer during 10 week internship program. Train students on laboratory and field equipment and advise them through independent research projects culminating in conference presentations.
- 24 students mentored by H.S. Jenkins through this program since 2015.

Honors Capstone Advisor, Department of Environmental Studies, University of Redlands, 2014 – Present.

- Advise and mentor 2-5 honors capstone students per year through the scientific research process.

Johnston Advisor, Johnston Center for Integrative Studies, University of Redlands, 2014 – Present.

- Advise and mentor 1-2 Johnston students per year, regularly sitting on (or chairing) sophomore and senior graduation committees.

Academic Advisor, Department of Environmental Studies, University of Redlands, 2014 – Present.

- Advise 25-40 Environmental Studies, Science, and Business majors on curricular matters annually.

Kappa Sigma Sigma Faculty Advisor, University of Redlands, 2022 - 2023.

- Meet bimonthly with the Kappa Sigma Sigma to discuss student concerns and needs, approve budgetary changes, and support local philanthropy projects.

ASUR Faculty Liaison, University of Redlands, 2021 – 2022.

- Meet monthly with the ASUR Cabinet and the CAS Dean's Office to discuss student concerns and needs.

Spatial Studies Minor Advisor, University of Redlands, 2014 – 2019.

- Reviewed Senior Spatial Studies Portfolios and advised 10-15 Spatial Studies minors annually.

International Relations Minor Advisor, University of Redlands, 2015 – 2017.

- Advised 1-3 International Relations minors on curricular matters annually.

Green Business Council Advisor, University of Redlands, 2014 – 2016.

- Met with students bimonthly to discuss campus-activities to promote green initiatives.

Summer Bridge Program Mentor, University of Redlands, 2015.

- Mentored and advised 3 Summer Bridge students to help facilitate the transition to college.

Honors Capstone Advisor, Department of Earth & Planetary Sciences, Harvard University, 2014.

- Advised and mentored 5 honors capstone students through the scientific research process.

SERVICE TO THE DEPARTMENT

Program Review, 2021 – 2022

- Composed and submitted 71 page Self-Study for 5-year program review for the Department of Environmental Studies.
- Created timeline, conducted alumni and student surveys, compiled institutional data, conducted peer institutional comparisons analysis, suggested external reviewers, and wrote comprehensive narrative.

Department Chair, 2018 – 2021

- Submitted 11 position requests, managed the department budget, supervised and hired adjuncts annually, conducted annual assessments, advised transfer students, developed program brochures, and facilitated the transition of EVST courses to the LAI.

Curriculum Restructure, 2016 – Present

- Submitted new numbering scheme, pre-requisites, and LAI requests as part of an overarching restructuring of our curriculum requirements.
- Revise and update Environmental Studies, Science, and Business degree program requirements and curricular structure. Submit catalog copy and course documentation to the Curriculum Committee as needed.

Assessment Reporting, 2015 – Present

- Conduct annual assessment for the Environmental Studies department by generating rubrics, reading artifacts, and writing annual reports to assess learning outcomes.
- Six separate assessment reports written and analyses performed.

Academic Planning Committee, Harvard University, 2010 – 2014.

- Updated program requirements and designed curricula for the Department of Earth & Planetary Sciences.

Bok Center for Teaching & Learning Liaison, Harvard University, 2010 – 2014.

- Trained and supervised graduate teaching fellows in the Department of Earth & Planetary Sciences.

SEARCH COMMITTEES

AY 2023 - 2024	• Director of the Office of Career & Professional Development, *Search Committee Member.* Hire: James Dusserre
AY 2020 – 2021	• Visiting Lecturer in Environmental Science, *Search Committee Member.* Hire: ABD. Kavita Rajah-Boyer
AY 2019 – 2020	• Visiting Professor in Environmental Science, *Search Committee Chair.* Hire: Dr. Trevor Browning
AY 2018 – 2019	• Visiting Professor in Sustainable Business, *Search Committee Chair.* Hire: Dr. Jacob Bethem
	• Assistant Professor in Political Science, *External Committee Member.* Hire: Dr. Althea Sircar
AY 2017 – 2018	• Visiting Professor in Environmental Studies, *Search Committee Chair.* Hire: Dr. Shellie Zias-Roe
	• Assistant Professor in Environmental Studies, *Search Committee Member.* Hire: Dr. Valerie Rountree
AY 2016 – 2017	• Visiting Professor in Spatial Studies, *Search Committee Member.* Hire: Dr. Alana Belcon
	• Lecturer in Environmental Studies, *Search Committee Member.* Hire: Dr. Jennifer Verdolin
AY 2015 – 2016	• Visiting Professor in Environmental Studies, *Search Committee Member.* Hire: Dr. Joanna Dill

SERVICE TO THE UNIVERSITY

- **ALURA-STEM Award Committee**, Member, 2015 – Present.
- **Position Request Task Force**, Member, 2022 – 2023.
- **Grid Assessment Task Force**, Chair, 2021 – 2022.
- **Emergency Working Group I**, Member, 2020 – 2021.
- **Faculty Review Committee**, Member, 2019 – 2021.
- **Position Request Working Group**, Member, 2018 – 2019.
- **Spatial Studies Advisory Board,** Member, 2014 – 2019.
- **Spatial Studies Program,** Chair, 2017 – 2018.
- **Untenured Faculty Caucus,** Co-Chair, 2015 – 2018.
- **Curriculum Committee,** Member, 2015 – 2017.
- **International Relations Advisory Board,** Member, 2015 – 2017.

- **Undergraduate Curriculum Committee,** Member, Harvard University, 2012 – 2014.
- **Conference Planning Committee,** Session Chair, Harvard University, 2010 – 2014.

• **Teaching in the Sciences Conference,** Session Moderator, Harvard Summer Institute, 2013.
• **Data Jam to Promote Active Learning,** Member, Massachusetts Institute of Technology, 2013.
• **Faculty Fellow,** Eliot House, Harvard University, 2013.
• **Faculty Fellow,** Winthrop House, Harvard University, 2014.
• **Thinking with Your Eyes,** Digital Futures Consortium, Presenter, Harvard University, 2014.

SERVICE TO THE COMMUNITY

• **Santa Ana Watershed Symposium Planning Committee**, Board Member, 2023 – Present.

• **Headwaters Resiliency Council**, Member, San Bernardino Valley Municipal Water District, 2023 – Present.

• **Safe Clean Water Program**, Reviewer, 2024 – Present.

• **Town & Gown Board of Directors,** Board Member, 2017 – 2020.

• **Bear Paw Weather Station,** Manager of continuous weather data monitoring at local research site 10 miles east of Redlands, CA, 2020 – Present.

• **San Bernardino National Forest Meadow Hydrology,** Manager of piezometer network to monitor groundwater flow in priority meadows in the Big Bear Valley Watershed, 2015 – Present.

PEER REVIEWER

- Proceedings of the National Academy of Sciences
- Earth & Planetary Science Letters
- Eos Transactions, American Geophysical Union
- Journal of Plant Ecology & Diversity
- Journal of Geophysical Research – Atmospheres
- National Geographic Society Grant Programs

PROFESSIONAL AFFILIATIONS

- American Association of Geographers (AAG), Member, 2021 – Present.
- Association of Women Geologists (AWG), Member, 2019 – Present.
- American Geophysical Union (AGU), Member, 2005 – Present.
- Geological Society of America (GSA), Member, 2004 – 2019.
- New Mexico Geological Society (NMGS), Member, 2004 – 2009.

PROFESSIONAL DEVELOPMENT

2023 • Hunsaker Teaching Consortium, *Teaching Collaborative,* University of Redlands, CA, June 2022 – May 2023.

2019 • Hunsaker Fellows, *Scholars Among Us,* Mira Flores, Redlands, CA, April, 2019.

2018 • Hunsaker Teaching Workshop, *Coaching & Teaching*, University of Redlands, October, 2018.

2017 • Hunsaker Teaching Workshop**,** *Defining truth, Engaging Evidence and Confronting Alt-Facts*, University of Redlands, February, 2017.

2016 • Hunsaker Teaching Workshop, *Pedagogical opportunities and challenges in our classrooms and beyond*, University of Redlands, September, 2016.
• National Science Foundation Workshop, *Get That Award*, UC Riverside, May, 2016.

2015 • Faculty Seminar in Teaching Writing, University of Redlands, January-April, 2015.
• Hunsaker Teaching Workshop, *Working Your Way In: Discussing New(ish) Teaching Experiences at U of R*, University of Redlands, October, 2015.
• Hunsaker Teaching Workshop, *Approaches to teaching critical thinking*, University of Redlands, March, 2015.

2014 • American Geophysical Union Fall Conference Workshop, *Getting the most out of your introductory courses,* December 2014.
• Hunsaker Teaching Workshop, *To Redlands and Beyond: Community Service Learning and Teaching*, University of Redlands, October, 2014.

June 27, 2024

Ms. Athena L. Laroche
SBVWCD
1630 W. Redlands Blvd Suite A
Redlands CA 92373

Dear Athena:

My name is Mark Falcone. I am writing to express my interest in serving as Director for the open Board seat in Division 2 on the San Bernardino Valley Water Conservation District Board of Directors.

I have lived in Division 2 and I have called East Highlands Ranch home for the last 31 years. My community service began in 2014 when I was elected to East Highlands Ranch Home Owners Association's Board of Directors. I was elected to four, two-year terms and served as Vice President for six of my eight years before resigning my seat to work for the management company overseeing the daily operation of the association.

My interest in water began when East Valley Water District was in the planning and approval stages for their new Sterling Natural Resource Center wastewater treatment facility. To see the project go from concept to reality is nothing short of amazing. In 2022 I was appointed to, and presently serve as, a Commissioner on the Community Advisory Commission for East Valley Water District.

Earlier this year, over the course of three days, I toured the State Water Project with several people from Metropolitan Water District, San Bernardino Valley Municipal Water District, Yucaipa Valley Water District and East Valley Water District.

I was captivated by the amazing feats of engineering design it takes to get water from the Feather River, through the Oroville spillway down into the Delta, through the aqueduct, up 2000 feet at the Edmonston Pumping Plant and down into our communities here locally. I also learned just how much special interest and bureaucracy plays a role in bringing much needed projects like the Sites Reservoir and the Delta Conveyance Project on line.

Professionally I have over 35 years of management and leadership experience. I led the west coast retail operations for the two largest retailers in the dietary supplement industry with sales volume in excess of $100M. I also operated my own business for 15 years where I breathed life into a business with zero market presence and built it to where revenue was in excess of $1M annually prior to the Covid pandemic.

Our culture views water as a natural resource we expect will always be there. We know this isn't true. Effective stewardship of this precious resource and ensuring it is safe and reliable is critical.

I look forward to discussing this open seat with General Manager Miller and the remainder of the Board of Directors.

Sincerely,

Mark Falcone
7740 Somerset Lane
Highland CA 92346
(909) 856-5353
mefalcone@roadrunner.com

MF

Mark Falcone – CCAM, PM

mefalcone@roadrunner.com
(909) 856-5353
Highland, CA 92346-5847

Professional Summary

California Certified Community Association Manager with 10 years of industry experience between board of director service and on-site production. Successful small business owner with business format franchise experience. Over 17 years of experience leading regional multi-unit retail operations.

Work History

The Management Trust - Modifications Compliance Inspector
01/2022 - Current

- Routinely conducted exterior inspections of 2488 single family homes in accordance with the modification guidelines, rules, and regulations.
- Developed monthly Covenant Hearing agendas and provided back up documentation to help facilitate fair and impartial rulings.
- Performed timely escrow inspections and communicated with all levels of staff and management.
- Established relationships with homeowners through trust, respect, understanding, empathy, and resolution.

Falcone Enterprises, Inc. - President/CEO
06/2007 - 01/2022

- Owner of 22 Heaven's Best Carpet Cleaning franchise agreements that spanned the geography of the Inland Empire of Southern California.
- Enhanced company performance by implementing strategic plans and overseeing daily operations.
- Drove revenue growth by expanding product offerings and identifying new market opportunities.
- Increased customer satisfaction through continuous improvement initiatives and excellent customer service.
- Hired and managed employees to maximize productivity while training staff on best practices and protocols.

Skills

- Time management
- Ethical standards
- Problem solving
- Decision making
- Attention to detail
- Conflict resolution
- Organizational skills
- Critical thinking
- Documentation Skills

Education

06/1983
Buena Park High School
Buena Park, CA
High School Diploma

Certifications

Certified Community Association Manager - CCAM, California Association of Community Managers - CACM, July 2023

The Vitamin Shoppe - Regional Director West Coast
04/2003 - 01/2007

- Directed, supported, and developed seven District Managers in a ten-state territory, with 83 retail units, over 450 store level employees with annual sales volume of $115 million.
- Maintained a consistent business focus with each District Manager with emphasis on financial performance.
- Utilized store visits to communicate with and mentor store personnel while strengthening their store presentations and operational standards.
- Established a culture of continuous improvement by fostering open communication channels and empowering employees to voice their ideas.
- Established a culture of accountability by setting clear expectations and holding individuals responsible for results.
- Met quarterly with the SVP, CFO and CEO for a financial review of the Region.
- Opened over 70 stores in three years.

General Nutrition Centers - Division Sales Director West Coast
01/1996 - 04/2003

- Directed, supported and developed 11 District Managers in a ten-state territory with 272 retail units, 800 store level personnel with annual sales volume in excess of $90 million.
- Analyzed the operating financial performance with each District Manager monthly.
- Established a culture of continuous improvement by fostering open communication channels and empowering employees to voice their ideas.
- Established a culture of accountability by setting clear expectations and holding individuals responsible for results.
- Searched, identified, and capitalized on all local new product fads.
- Collaborated with the SVP of Stores on issues relating to operational budgets, expense controls, sales team development and market growth.

Volunteer Experience

- East Valley Water District Community Advisory Commission, 31111 Greenspot Road, Highland, CA, 92346, January 2023 through current

- East Highlands Ranch MHOA Board of Directors, 7136 Club View Drive, Highland, CA, 92346, May 2014 through February 2022

- Heaven's Best Carpet Cleaning Franchise Advisory Council, 957 South 12th Street West, Rexburg, ID, 83440, January 2018 through December 2022

San Bernardino Valley
Water Conservation District
Helping Nature Store Our Water

Memorandum No. 2039

To: **Board of Directors**

From: **John M. Lambie, P.E., Chief Consulting Engineer**

Date: **July 24, 2024**

Subject: **Amendment to the Plunge and Oak Creek Diversions and Basins Feasibility Study Professional Services Contract with CASC Engineering**

RECOMMENDATION

Approve the Amendment to Contract Services Agreement for Professional Services for the Active Recharge Transfer Projects (ARTP) Plunge Creek and Oak Creek Diversions and Basins Projects Feasibility Study Support ("Amendment"), and authorize the General Manager to execute an amendment to the professional consultant services agreement in an amount not to exceed $46,300.

BACKGROUND

On November 14, 2018, the Board approved a Partnership Agreement for Join Active Recharge Project Development under the Upper Santa Ana River Habitat Conservation Plan with the San Bernardino Valley Municipal Water District (Valley District). This five-year Agreement created an essential partnership between these agencies, providing conservation easements on Conservation District-owned lands to satisfy anticipated habitat mitigation requirements for the HCP in exchange for compensation intended to be dedicated to increasing groundwater recharge in accordance with the Conservation District's mission. The Agreement contemplated a potential series of collaborative projects designed to meet this goal, initially termed the Active Recharge Transfer Projects (ARTP) and now referred to as the Program for the Expansion of Recharge Capacity (PERC).

On December 13, 2023, the Board approved a First Amendment to extend that Agreement through January 8, 2029.

These agreements specified certain planned PERC projects, including Plunge Creek and its tributary Oak Creek in Highland, California, to be analyzed for feasibility by the Conservation District.

Following a Request for Proposals (RFP) released on November 13, 2021, the Conservation District entered into a contract with CASC Engineering on March 4, 2022, to prepare and analyze hydrology studies, hydraulic studies, sediment transport analyses, geotechnical site investigations, field surveys, basin routing, recharge estimates, quantity calculations, value engineering, groundwater modeling, and preparation of exhibits and compilation of results into a feasibility study report.

1630 W. Redlands Blvd, Suite A
Redlands, CA 92373
Phone: 909.793.2503
Fax: 909.793.0188
www.sbvwcd.org Email: info@sbvwcd.org

DISCUSSION

Under its contract, CASC prepared a hydrology study for 100-year return frequency stormflow events and analyzed higher frequency stormflow events (e.g., two-year return frequency). Following review, Conservation District staff determined that the provided materials meet the standards required to inform the prioritization of PERC projects as described in the RFP. However, upon review of the hydrologic study prepared by CASC in response to the "average annual run-off" metric included in the RFP, Conservation District staff raised concerns that this work alone, based on daily and annual average flow rates, is not sufficient to properly evaluate the probable water amounts available for retention and recharge from unregulated stormflows in these watercourses. Specifically, additional data analysis, at a finer temporal scale, would significantly improve the evaluation of diversion and basin sizing to optimize yields through the cost-benefit analysis.

The proposed Amendment addresses this concern by scoping statistical hydrologic analyses using the real-time interval hydrologic data at fifteen-minute intervals available from a USGS gage of streamflow from the upper Plunge Creek watershed, from 1988 to the present.

Contract	Approval Date	Project Scope Description	Cost
Original Contract	March 4, 2022	PERC Project Alternatives Development and Analysis for Oak Creek and Plunge Creek Feasibility Studies Support	$786,880
Proposed Amendment	N/A	PERC Project Hydrology Statistical Study for Oak Creek Project Site and Plunge Creek Project Sites	$46,300

FISCAL IMPACT

Approval of this item will result in the expenditure of up to $46,300 from Capital GL 7126, PERC Engineering/Professional Services.

POTENTIAL MOTIONS

1. Approve the Amendment to Contract Services Agreement for Professional Services for the Active Recharge Transfer Projects (ARTP) Plunge Creek And Oak Creek Diversions and Basins Projects Feasibility Study Support ("Amendment"), and authorize the General Manager to execute an amendment to the professional consultant services agreement in an amount not to exceed $46,300.
2. Refer this item to the Operations Committee meeting on August 6, 2024, noting delays in the project schedule.
3. Direct staff to move forward with the analyses currently available, noting the lack of consistency between various PERC sites.

ATTACHMENTS

Amendment to Contract Services Agreement for Professional Services for the Active Recharge Transfer Projects (ARTP) Plunge Creek and Oak Creek Diversions and Basins Projects Feasibility Study Support

AMENDMENT TO CONTRACT SERVICES AGREEMENT FOR PROFESSIONAL SERVICES FOR THE ACTIVE RECHARGE TRANSFER PROJECTS (ARTP) PLUNGE CREEK AND OAK CREEK DIVERSIONS AND BASINS PROJECTS FEASIBILITY STUDY SUPPORT

THIS AMENDMENT TO CONTRACT SERVICES AGREEMENT FOR PROFESSIONAL SERVICES FOR THE ACTIVE RECHARGE TRANSFER PROJECTS (ARTP) PLUNGE CREEK AND OAK CREEK DIVERSIONS AND BASINS PROJECTS FEASIBILITY STUDY SUPPORT ("Amendment") by and between the **SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT,** a California Special District ("District"), and CASC Engineering and Consulting ("Consultant"), is effective July 10, 2024 ("Effective Date").

This Amendment is entered into in consideration of all of the following:

A. WHEREAS; District and Consultant entered into that certain Contract Services Agreement For Professional Services For The Active Recharge Transfer Projects (ARTP) Plunge Creek And Oak Creek Diversions And Basins Projects Feasibility Study Support on or about March 4, 2022 ("Original Agreement"); and

B. WHEREAS, the parties have performed under the Original Agreement, including the provision by Consultant of a hydrology study for 100-year return frequency stormflow events, as well as the analysis of higher frequency stormflow events; and

C. WHEREAS, District has reviewed Consultant's work product, and has determined that a more refined analysis of flow and hydrological data, focused on shorter time intervals, will be useful and beneficial to determinations of basin sizing and capacity purposes, because it will better indicate probable water amounts available for retention and recharge from unregulated stormflows in these watercourses.

NOW, THEREFORE, in light of all of the foregoing, the parties hereto agree as follows:

1. Section 1.1 of the Original Agreement is hereby amended as follows:

Scope of Services. In compliance with all of the term and conditions of this Agreement, the Consultant shall also provide the services consistent with the Amendment Scope of Services attached to this Amendment as Exhibit A. Such services shall be in addition to, and not in place or in derogation of, the original scope of services provided in the Original Agreement. Consultant warrants that all such additional work in the Amendment Scope of Services will be performed in a competent, professional, and satisfactory manner.

2. Section 2.0 of the Original Agreement is hereby amended as follows:

2.0 Contract Sum. For the additional services rendered pursuant to this Amendment, the Consultant shall be paid an amount not to exceed a total payment of Forty-Six Thousand Three Hundred Dollars ($46,300.00). Charges shall be consistent with the rates stated in Exhibit A hereto, provided, however, that Consultant shall not exceed the total amount of $46,300.00 for all such services, without the prior, written consent of the District.

3. Except as specifically amended by this Amendment, the Original Agreement is and shall remain valid and fully enforceable, and apart from the expended scope of services and the additional compensation provided for hereunder, the Original Agreement shall govern the provision of services under this Amendment. under this Amendment, in all other particulars.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement and by signature below:

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

By: _____

Its: _____

CONSULTANT

By: _____

Its: _____

Exhibit A

Amendment

Scope of

Services

AMENDMENT

SCOPE OF SERVICES

1 EXISTING DATA ANALYSIS

1.1 PLUNGE CREEK DATA ANALYSIS

Casc will analyze the 35-year record of 15-minute data from Upper Plunge Creek USGS Gage 110555500 [Upper Plunge Creek] to define the parameters listed below that will form the basis of extrapolating runoff yields from adjacent ungauged watersheds (Oak Creek, Elder Creek, and Storm Drain as shown on the attached Scope Exhibit). Casc and SBVWCD will reach consensus on the values to be used prior to conducting further analysis:

- Confirmation of 50th, 80th, and 90th percentile flow rates provided by the SBVWCD of the Upper Plunge Creek.
- Determination of the low flow cutoff, (i.e., the flowrate that defines the start and end of a storm flow event in this analysis) for Upper Plunge Creek. This low flow cutoff will also be used for the analysis of the other watersheds as well.
- Statistical evaluation of the time intervals between stormflow events during the rainy season of October to May using the low flow cutoff.
- Count of the number of distinct stormflow events in the 35-year record throughout the year

1.2 PLUNGE CREEK EVENT ANALYSIS

For each stormflow event defined in 1.1, Casc will calculate and tabulate the duration of the events above the low flow cutoff in units of days (i.e., non-integer) along with calculating the mean, median, and modal values of stormflow duration in days. Similarly, CASC will calculate and tabulate the time intervals between the distinct stormflow events in days, and the mean, median, and modal values of the time intervals between events in days.

1.3 PRISM 30-YEAR PRECIPITATION NORMALS SPATIAL ANALYSIS AND RATIO CALCULATIONS

Casc will apply the PRISM 30-year precipitation normals over the Plunge Creek, Oak Creek, Storm Drain, and Elder Creek Watersheds and develop ratios of the volume of water incident upon those watersheds with the volume of water in upper Plunge Creek as the denominator. Those ratios will enable scaling of the measured flow rates in upper Plunge Creek to estimates of concurrent flow rates in each.

- Since PRISM data is spatially variable, Casc will calculate an average precipitation value for each watershed using a weighted average based on area. Each PRISM data point will be weighted by the area of its grid cell, which is coincident with the watershed area.
- Each watershed will have an average precipitation value, which will be defined as PP for Plunge Creek, PE for Elder Creek, PO for Oak Creek, and PS for Storm Drain. From these averages, the Elder Creek, Oak Creek, and Storm Drain ratios will be calculated as PE/PP, PO/PP, and PS/PP, respectively.
- Casc will then generate synthetic time-series flow rates from the Plunge Creek gage record to produce representative time-series flow rates for Oak Creek, Elder Gulch, and the Storm Drain area.

2 OAK CREEK BASIN ANALYSIS

2.1 OAK CREEK EVENT ANALYSIS

- Based on the estimated time-series flow rates for Oak Creek developed in Task 1.3, Casc will determine the 50th, 80th, and 90th percentile flow rates for the prospective POD sizing analysis.
- For each Oak Creek stormflow event, Casc will calculate the volume of water that would have been available using diversions up to the 50th percentile flow rate, the 80th percentile flow rate, and the 90th percentile flow rate. For the potential project-interception-volume calculations each of the percentile flow rates will be used as the maximum diversion-rate capacity. To calculate the divertable stormflow volume, the flow rates from Task 1.3 will be piece-wise integrated in 15-minute increments beginning at the event start, increasing up to the potential maximum diversion rate as the peak rate for that and then decreasing back down to the defined end-of-stormflow (i.e., the duration or time period in the Plunge Creek record).
- In addition, using the duration above the percentile flow rate CASC will calculate the bypassed stormflow volume that could not be diverted due to the limiting diversion flowrate and tabulate the total volume in the storms over the 35-year record. Casc will count the number of time intervals that exceed the 50th percentile, 80th percentile, and 90th percentile flow rates. Some stormwater runoff events will have a length of time that exceeds one or more of these percentile flow rates (exceedance time length).
- In addition, Casc will calculate the statistics of divertable volumes by stormwater event for each percentile flow-rate diversion.

2.2 OAK CREEK COMBINED EVENT ANALYSIS

Proposed Oak Creek Basin is expected to receive flow from a proposed diversion from Oak Creek to be determined, and all runoff carried from the Greenspot storm drain system (Storm Drain Watershed). This task will calculate the volumes available for the combined Storm Drain Watershed events for the 50th, 80th, and 90th percentile flow rates.

3 PLUNGE CREEK BASIN COMBINED EVENT ANALYSIS

- Casc will combine the event data from the three watersheds (Plunge, Oak, Elder) to create events for the analysis of Plunge Basin (Plunge Basin Events).Casc will determine the 50th, 80th, and 90th percentile flow rates from the Plunge Basin Events.For each Plunge Basin Event, Casc will calculate the volume of water that would have been available using diversions at Plunge Basin up to the 50th percentile flow rate, the 80th percentile flow rate, and the 90th percentile flow rate. For the potential project-interception-volume calculations each of the percentile flow rates will be used as the maximum diversion-rate capacity. To calculate the divertable stormflow volume, the flow rates from Task 1.3 will be piece-wise integrated in 15-minute increments beginning at the event start, increasing up to the potential maximum diversion rate as the peak rate for that and then decreasing back down to the defined end-of-stormflow (i.e., the duration or time period in the Plunge Creek record).
- In addition, using the duration above the percentile flow rate CASC will calculate the bypassed stormflow volume that could not be diverted due to the limiting diversion flowrate and tabulate the total volume in the storms over the 35-year record. Casc will count the number of time intervals that exceed the 50th percentile, 80th percentile, and 90th percentile flow rates. Some stormwater

runoff events will have a length of time that exceeds one or more of these percentile flow rates (exceedance time length).

- In addition, Casc will calculate the statistics of divertable volumes by stormwater event for each percentile flow-rate diversion.
- The calculations will be performed under four different scenarios where runoff is diverted from Oak Creek into Oak Creek Basin:
  - No diversion from Oak Creek into Oak Creek Basin
  - 50th percentile diversion (from Task 2.1) from Oak Creek into Oak Creek Basin
  - 80th percentile diversion (from Task 2.1) from Oak Creek into Oak Creek Basin
  - 90th percentile diversion (from Task 2.1) from Oak Creek into Oak Creek Basin

4 PLUNGE AND OAK CREEK EVENT ANALYSIS TECHNICAL MEMORANDUM

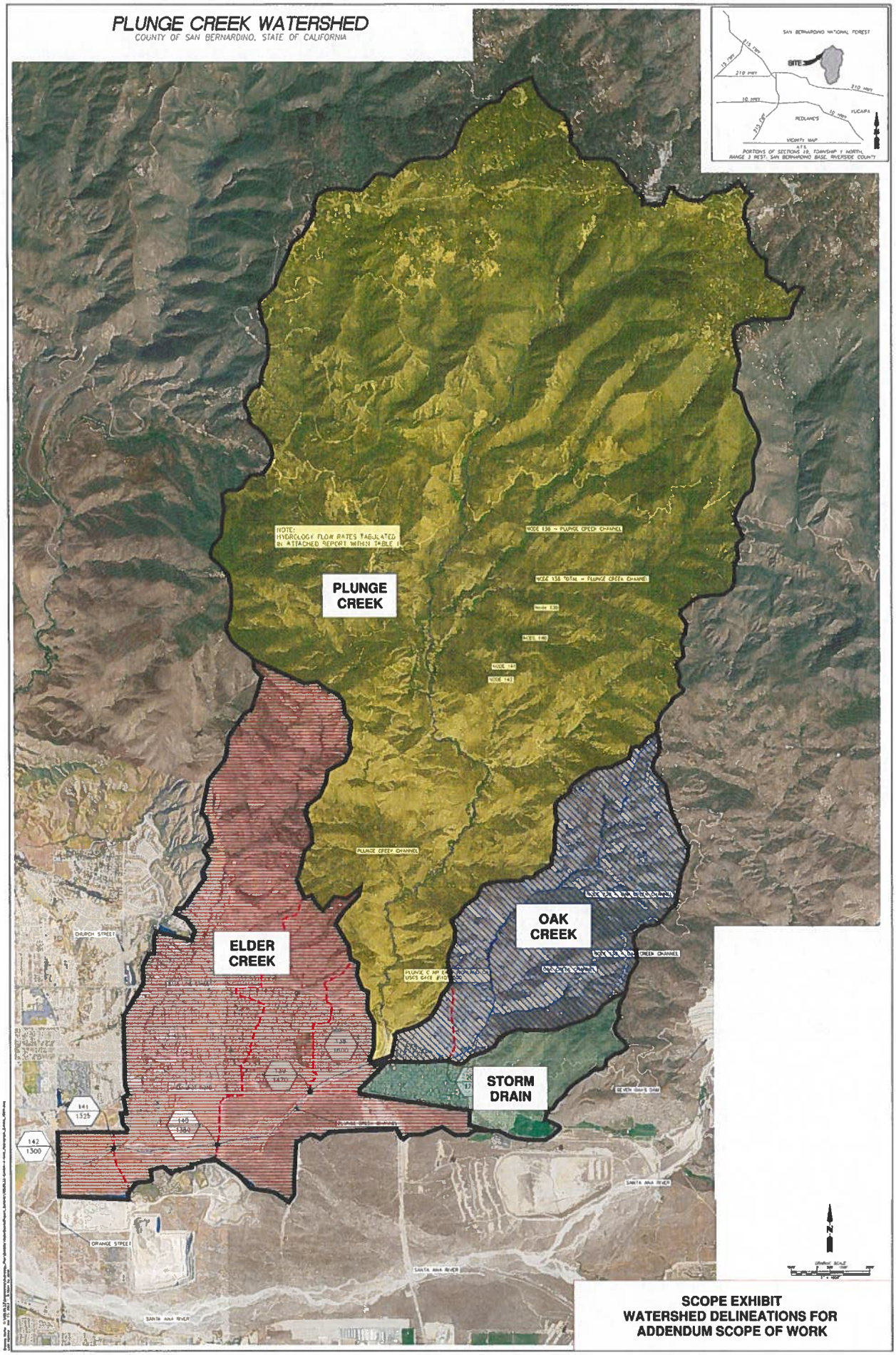
Casc will prepare a technical memorandum (TM) of the analysis described in this addendum scope of work. The TM will describe the climatic based extrapolation of flow rates, include a statistical analysis of project location flow rates, and depict the integration of flow volumes out of hydrographs extrapolated from the 15-minute data record as described in the scope of work. The TM will include summary tables and charts derived from the analysis, and an exhibit showing the overlay of the PRISM30 data on the tributary watersheds analyzed in the report.

A draft report will be submitted to SBVWCD for review. Casc will incorporate SBVWCD comments into a revised report for acceptance. Minor corrections on the revised report will be addressed in a final report to SBVWCD.

An internal review of each report iteration will take place before submittal. Upon submittal, Casc will provide a link to the reviewed copy of the report to SBVWCD for verification that the internal review has taken place.

5 PROJECT MANAGEMENT

Casc will oversee the management of the project, and work as liaison between the design team and SBVWCD. Casc will correspond as necessary with SBVWCD during the development of the analysis and the report, and will meet with SBVWCD to discuss comments on the draft report. Informal meetings and/or calls via Teams are expected during the process. Casc and SBVWCD will meet as reasonably deemed necessary by SBVWCD. Invoicing and progress reports will be as under the current contract, with this scope of work and budget amended to it.


PLUNGE CREEK WATERSHED
COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
SAN BERNARDINO NATIONAL FOREST
SITE
210 HWY
10 HWY
FONTANA
REDLANDS
VICINITY MAP
PORTIONS OF SECTIONS 18, TOWNSHIP 1 NORTH, RANGE 3 WEST, SAN BERNARDINO BASE, RIVERSIDE COUNTY
NOTE:
HYDROLOGY FLOW RATES TABULATED IN ATTACHED REPORT WITHIN TABLE 1
PLUNGE CREEK
OAK CREEK
ELDER CREEK
STORM DRAIN
CHURCH STREET
ORANGE STREET
SANTA ANA RIVER
SCOPE EXHIBIT
WATERSHED DELINEATIONS FOR
ADDENDUM SCOPE OF WORK

SBVWCD-ARTP PLUNGE CREEK AND OAK CREEK DIVERSION AND BASIN(S) FEASIBILITY STUDY SUPPORT SERVICES
AMENDMENT - PLUNGE AND OAK CREEK EVENT ANALYSIS

		Director	Senior Engineer IV	JLC	Staff Assistant	Task Labor Total	
	Rate	**$235.00**	**$205.00**	**$161.00**	**$100.00**	**Hours**	**Labor Fee**
1	**Existing Data Analysis**						
1.1	Plunge Creek Data Analysis			4		4	$644.00
1.2	Plunge Creek Event Analysis			36		36	$5,796.00
1.3	PRISM 30-year Precipitation Normals Spatial Analysis and Ratio Calculations			28		28	$4,508.00
2	**Oak Creek Basin Analysis**						
2.1	Oak Creek Event Analysis			28		28	$4,508.00
2.2	Oak Creek Combined Event Analysis			12		12	$1,932.00
3	**Plunge Creek Basin Combined Event Analysis**			40		40	$6,440.00
4	**Plunge and Oak Creek Event Analysis Tech Memo**	8	24	40		72	$13,240.00
5	**Project Management**	12	16	12	12	52	$9,232.00
	Total Hours (Estimate)	**20**	**40**	**200**	**12**	**272**	
	Total Fee (Estimate)	**$4,700.00**	**$8,200.00**	**$32,200.00**	**$1,200.00**		**$46,300.00**