

Emma R. Fryer

Curriculum Vitae

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EDUCATION

Master of Science, Biological Sciences. California Polytechnic State University (Anticipated 2022)
Bachelor of Science, Botany, *summa cum laude*. Humboldt State University (2016)

GRANTS, AWARDS, SCHOLARSHIPS & HONORS

2021 – Malcolm McLeod Scholarship, San Luis Obispo CNPS Chapter – \$800
2021 – Paul Silva Student Research Grant, California Botanical Society – \$600
2021 – Student Research Scholarship, Northern California Botanists – \$1,000
2021 – Research Grant, Alta Peak CNPS Chapter – \$500
2021 – Howard-Kohn Memorial Scholarship, Marin CNPS Chapter – \$3,000
2021 – Graduate Student Research Fellowship, Torrey Botanical Society – \$1,000
2021 – Summer Scholarship in Field Botany, Garden Club of America – \$3,000
2021 – Gertrude R. Hardman Native Plant Research Award, California Native Plant Society – \$600
2021 – Jessica Mae Orozco Grant, Southern California Botanists – \$1,000
2020 – Sally Casey Graduate Research Scholarship, Santa Clara Valley CNPS Chapter – \$1,500
2020 – Honorable Mention, Graduate Research Fellowship Program, National Science Foundation
2020 – David & Frieda Wertman Scholarship, California Polytechnic State University – \$2,500
2016 – Dennis Walker Award, Department of Biological Sciences, Humboldt State University – \$1,000
2015 – Blanche G. Williams & Gertrude G. Graham Award, Humboldt State University – \$1,000
2015 – PLANTS Grant, Botanical Society of America & National Science Foundation – \$1,000

PUBLICATIONS

1. **Fryer, E. R.**, M. A. Afonin, B. Bomfleur, and A. M. F. Tomescu. (*In preparation*). A new species of *Protocedroxylon* from the Lower Cretaceous of California. Target journal: The International Journal of Plant Sciences.
2. Burnett, J. K., **E. R. Fryer**, C. R. Unger, and A. M. F. Tomescu. 2016. Pinaceous wood from the Lower Cretaceous (Barremian-early Aptian) of California, USA – Lower Chikabally Member, Budden Canyon Formation. *Ameghiniana*, 53(6): 685-694.

PRESENTATIONS (* - with published abstract)

1. **Fryer, E. R.**, R. E. O'Dell, and N. Rajakaruna. 2021. Community Assembly of Vertic Clay Endemic Annual Plants of the San Joaquin Desert. Botanical Society of America 116th Annual Meeting, virtual meeting*.

2. **Fryer, E. R.**, R. E. O'Dell, and N. Rajakaruna. 2021. Community Assembly of Vertic Clay Endemic Annuals of the San Joaquin Desert. California Botanical Society 28th Graduate Student Symposium, virtual meeting*.
3. **Fryer, E. R.** 2019. Rare Lichens and Bryophytes. Caltrans Central Region Off-site Conference, Stockton, California.
4. **Fryer, E. R.**, and A. M. F. Tomescu. 2016. Conifer wood from the Lower Cretaceous of northern California: implications for *Protocedroxylon* taxonomy. Botanical Society of America 111th Annual Meeting, Savannah, Georgia*.
5. **Fryer, E. R.**, and A. M. F. Tomescu. 2015. Early Cretaceous permineralized wood with araucarioid characters in the Budden Canyon Formation of California. Botanical Society of America 110th Annual Meeting, Edmonton, Canada*.

WORK EXPERIENCE

Employment

California Polytechnic State University – Teaching Associate (January 2021 – present)
Teaching lab sections of BOT 121 (General Botany), BIO 162 (Organismal Form & Function), and MCRO 221 (Microbiology). Prepared, wrote, and graded quizzes and homework, prepared and delivered lab lectures in coordination with instructing professors and laboratory coordinator. Prepared course materials, syllabi, and curricula, held office hours, and provided student guidance on topics of plant and animal physiology and anatomy, and microbiology.

California Polytechnic State University – Graduate Assistant (September 2020 – September 2021)
Prepared grant applications and conducted literature reviews, experimental design, coordination, and implementation, and various academic research activities, on an as-needed basis. Planned and coordinated summer research projects and provided guidance, mentoring, and day-to-day supervision for undergraduate fellows in the Frost Undergraduate Research Program.

HDR Engineering, Inc.– Field Biologist (October 2017- November 2019)
On-site at Caltrans Central Region Environmental. Provided staff augmentation and acted as a specialist environmental planner and field biologist for Caltrans Central Region Biology, preparing technical environmental documents, biological impact assessments, permit applications for Fish and Game Code Section 1602 Lake and Streambed Alteration Agreements, Clean Water Act Section 404 Nationwide Permits, and Clean Water Act Section 401 Water Quality Certifications. Prepared permit compliance reports, managed conservation measure compliance, conducted biological monitoring, worker environmental awareness training, and mitigation monitoring and reporting, and planned, lead, and reported for protocol- and reconnaissance-level surveys for special status species.

Research Projects

Processing micrographs of an anatomical fossil of the dicksoniaceae fern *Onychiopsis* for 3D rendering and producing a 3D reconstruction of *Onychiopsis* vasculature – with Dr. Alexandru Tomescu (Humboldt State University)

Taxonomic placement and description of a Lower Cretaceous araucarioid fossil conifer wood from the Budden Canyon Formation of northern California – with Dr. Alexandru Tomescu (Humboldt State University)

Identification and description of a Lower Cretaceous pinaceous fossil conifer wood from the Budden Canyon Formation of northern California – with Dr. Alexandru Tomescu (Humboldt State University)

Chemical analysis of *Apis mellifera*-collected pollen from Humboldt County, California – In General Plant Physiology (BOT 310) (Humboldt State University)

Collection and mounting of a sample flora of the disturbed areas and roadsides of Humboldt County, California – directed study with the Humboldt State University Herbarium and Dr. J.P. Smith (Humboldt State University)

Investigation into the effects of media sucrose content and gas availability on gemmae production by cultured *Marchantia polymorpha* – directed study with Dr. Casey Lu (Humboldt State University)

Metabolic comparison of culturable endophytic and epiphytic bacteria associated with *Chenopodium quinoa* seeds – in General Bacteriology (BIOL 412) (Humboldt State University)

Field Work and Survey Experience

Collecting Devonian plant fossils from Cottonwood Canyon, Wyoming – with Dr. Alexandru Tomescu (Humboldt State University; July 2017).

Botanical surveys: percent-cover, presence/absence, and protocol, following *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*– with Caltrans Central Region staff (HDR and Caltrans Central Region Biology; October 2017 - November 2019).

Relocation and transplantation of a population of Sanford’s arrowhead (*Sagittaria sanfordii*) in Cameron Slough, Fresno County, California – with Caltrans Central Region staff (HDR and Caltrans Central Region Biology; November 2017).

Protocol surveys for Swainson’s hawk (*Buteo swainsoni*), San Joaquin kit fox (*Vulpes macrotis mutica*), and blunt-nosed leopard lizard (*Gambelia sila*) – with Caltrans Central Region staff (HDR and Caltrans Central Region Biology; February 2018 - November 2019).

Biological monitoring of migratory nesting birds and San Joaquin kit fox natal dens – with Caltrans Central Region staff (HDR and Caltrans Central Region Biology; February 2018 - November 2019).

Small mammal trapping for Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and giant kangaroo rat (*Dipodomys ingens*) – with Caltrans Central Region staff, U.S. Fish and Wildlife (HDR, Caltrans Central Region Biology, Pixley Wildlife Refuge; May 2018 - October 2018).

Botanical Illustration

Paleoleucobryum yamaguchii – Bippus, A. C., C. R. Unger, R. A. Stockey, G. W. Rothwell, and A. M. F. Tomescu. (In preparation). Permineralized moss gametophytes from Vancouver Island reveal that major lineages within Leucobryaceae (Bryophyta: Dicranidae) had already diverged by the Early Cretaceous. Target journal: *The Bryologist*.

Volunteer Work

Mounting plant collections from the Central Valley region, processing and evaluating collections – with Dr. Katherine Waselkov and the Fresno State University Herbarium; October 2017 to March 2020.

Rare plant status reviewer – with California Native Plant Society; March 2019 to present.

Student panelist, “Finding Your Way (in College and in Life)” – with Cal Poly Department of Biological Sciences; November 2020.

Workshops

California Environmental Quality Act Impact Assessment – with the California Native Plant Society Berkeley, California, October 2019

Poaceae – with Dr. Travis Columbus and the Jepson Herbarium Berkeley, California, May 2019

Wetland Delineation – with the Wetland Training Institute
Roseville, California, April 2019

Rare Plant Survey Protocols – with the California Native Plant Society
Imperial Beach, California, March 2019

Small Mammal Trapping Workshop – with the Yosemite Audubon Society
Ahwahnee, California, May 2018) – with Melissa Odell, SCIN 11023

PROFESSIONAL AFFILIATIONS

Botanical Society of America
California Native Plant Society

Southern California Botanists
Torrey Botanical Society

SKILLS

Cellulose-acetate peel technique for plant fossil sectioning
Light microscope photography
Basic bacterial culture and media preparation, aseptic technique
Basic plant tissue culture media preparation
Arcmap/GIS
Keying to species: vascular plants, bryophytes, lichens, macrofungi, and microfungi
Scientific botanical illustration
Basic map and compass skills
Backpacking and survival skills

RELEVANT COURSEWORK

Botany
Paleobotany
Ascomycetes & Basidiomycetes
Biology of the Microfungi
Plant Taxonomy
General Plant Physiology
Principles of Ecology

Lichens & Bryophytes
General Bacteriology
Organic Chemistry
Genetics
Evolution
Spatial Ecology
Cellular & Molecular Biology

REFERENCES

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