

NAME**ELKE NAUMBURG****TITLE****Ecohydrologist, Glorieta Geoscience Inc.****EXPERIENCE
SUMMARY**

20 Years experience encompassing the following areas:

- Effects of fluctuating groundwater levels on vegetation
- Natural vegetation responses to environmental stresses such as drought & shade
- Modeling of plant physiological and biomass responses to a range of environmental factors
- Sampling of vegetation conditions & surveys of forest, range & shrub ecosystems
- Evaluation of vegetation dynamics over time
- Plant propagation & greenhouse maintenance
- Chemical analyses of plant tissues for nutritional quality and 2° compounds
- Statistical analyses & data management

**SELECTED
PROJECT
EXPERIENCE****Environmental Consultant to Individual Dairy Producers and Dairy****Producers of New Mexico, GGI.** Worked on environmental compliance and permitting for individual dairies and collected and compiled literature on the fate of hormones associated with concentrated animal feeding operations.**Ecological Consultant to City of Los Angeles, Pacifica Services, Inc.**

As part of a large-scale project ensuring future water supply to the city of Los Angeles and the maintenance of healthy vegetation in Owens Valley, I managed several tasks within the project: successional vegetation dynamics following agricultural abandonment; relationship between groundwater depth and individual plant species; relationship between vegetation productivity and water availability. I managed and budgeted tasks, participated in project meetings, and coordinated with client personnel. I designed experiments and supervised staff in vegetation data collection, collected and analyzed vegetation dynamics data in relation to groundwater levels, and authored manuscripts, reports and presentations. I further parameterized and assisted with EDYS updates, a landscape-level ecological model. 2003 - 2005

Visiting Professor and Postdoctoral Research Assistant, University of Nevada, Las Vegas. Analyzed environmental and physiological factors affecting photosynthesis in desert shrubs under ambient and elevated CO₂ to develop seasonal gas exchange model. Designed field and greenhouse experiments and participated in proposal writing. Supervised undergraduate assistants. 2000 – 2002

Ecophysiological Research Assistant, Duke University

Designed and conducted experiments testing for species differences in dynamic photosynthetic responses to changes in light intensity in ambient and elevated CO₂. Coded and parameterized dynamic photosynthesis model. Maintained photosynthesis analyzers, data loggers, “baby-Kucera” sapflow gauges, radiation sensors. 1996 - 2000

Ecological Research Assistant, Northern Arizona University

Designed and conducted field study on the relationship between ponderosa pine stand structure, light environment and grass species presence and abundance as well as a greenhouse experiment evaluating effect of shade on native grass species. Hired, trained, and supervised student workers for biomass harvest. Assisted professor in writing McIntire-Stennis proposal to fund thesis research. 1994 - 1996

Chemical Research Technician, Northern Arizona University

Set up laboratory and gas chromatographs for resin acid and terpene analysis. Adapted resin acid analysis to ponderosa pine needles. 1994

Greenhouse Research Aide, Northern Arizona University

Propagated and maintained tree seedlings in greenhouse facility for field

**SELECTED
PROJECT
EXPERIENCE
(con't)**

FIELD EQUIPMENT

EDUCATION

**SCIENTIFIC
PUBLICATIONS**

**RECENT
PRESENTATIONS**

transplanting. Installed drip irrigation. Analyzed terpenes in ponderosa pine needles. Supervised and trained high school summer workers. 1991 - 1993
Agricultural Research Assistant, Technical University Munich, Germany
Oversaw vegetable experiments and analyzed their nutritional quality; handled data/statistical analyses; supervised/trained apprentices. 1986 – 1990

Analyzed hemispherical photographs, evaluated hydraulic conductivity and susceptibility to cavitation by plant stems (centrifuge method), used and serviced photosynthesis analyzers (CIRAS I, LI 6400), data loggers (Campbell, Delta-T, LI 1000), spectroradiometer (LI 1600), “Baby Kucera” sapflow system, radiation sensors (GaAsP 1118 photodiodes by Hamamatsu, LI-190), leaf area meters (CID, AgVis video camera/computer system) & Scion Image software. Utilized woody and herbaceous vegetation survey procedures.

PhD Plant Physiological Ecology, Duke University, 2000

MS Forest Ecology, University of Northern Arizona, 1996

BS Forest Management (*summa cum laude*), University of Northern Arizona, 1994

Barker, DH ; Vanier, C; **Naumburg**, E; Charlet, TN; Nielsen, KM; Newingham, BA; Smith, SD. 2006. Enhanced monsoon precipitation and N deposition affect leaf traits and photosynthesis differently in spring and summer in the desert shrub *Larrea tridentata*. New Phytologist, 169:799-808.

Housman, DC; **Naumburg**, E; Huxman, TE; Charlet, TN; Nowak, RS; Smith, SD. 2006. Increases in desert shrub productivity under elevated CO₂ vary with water availability. Ecosystems, 9:374-385.

Naumburg, E; Mata-Gonzalez, R; Hunter, RG; McLendon, T; Martin, DW. 2005. Phreatophytic vegetation and groundwater fluctuations: A review of current research and application of ecosystem response modeling with an emphasis on Great Basin vegetation. Environmental Management 35:726-740.

Ellsworth, DS; Reich, PB; **Naumburg**, E; Koch, GW; Kubiske, ME; Smith, SD. 2004. A comparison of photosynthetic characteristics and leaf nitrogen responses of 16 species to atmospheric CO₂ across four free-air CO₂ enrichment (FACE) experiments. Global Change Biology, 10:2121-2138.

Smith, SD; **Naumburg**, E; Niinemets, U; Germino, MJ. 2004. Environmental Constraints - Leaf to Landscape. In: Smith, WK; Vogelmann, TC; Critchley, C. Photosynthetic Adaptation. Springer, pp 262-294.

Naumburg, E; Loik, ME, Smith, SD. 2004. Photosynthetic responses of *Larrea tridentata* to temperature extremes under elevated CO₂. New Phytol 162:323-330.

Naumburg, E; Housman, D; Huxman, TE; Charlet, TN; Loik, ME; Smith, SD. 2003. Photosynthetic responses of Mojave Desert shrubs to Free Air CO₂ Enrichment are greatest during wet years. Global Change Biology 9:276-285.

Naumburg, E; Ellsworth, DS. 2002. Short-term light and leaf photosynthetic dynamics affect daily photosynthesis estimates. Tree Physiology, 22:393-401.

Naumburg, E; Ellsworth, DS; Pearcy, RW. 2001. Crown carbon gain and elevated CO₂ response of understory saplings with differing allometry and architecture. Functional Ecology, 15:263-273.

Naumburg, E; Ellsworth, DS; Katul, G. 2001. Modeling dynamic understory photosynthesis of contrasting species in ambient and elevated carbon dioxide. Oecologia, 126:487-499.

Naumburg, E; Ellsworth, DS. 2000. Photosynthetic sunfleck utilization potential of understory saplings growing under elevated CO₂ in FACE. Oecologia 122:163-174.

Naumburg, E; DeWald, LE; Kolb, TE. 2001. Shade responses of five grasses native to southwestern *Pinus ponderosa* forests. Canadian Journal of Botany, 79:1001-1009.

Naumburg, E; DeWald, LE. 1999. Relationships between *Pinus ponderosa* forest structure, light characteristics, and understory graminoid species presence and abundance. Forest Ecology & Management 124:205-215.

Naumburg, E, Hubbard, P, Martin, D, McLendon, T. 2005. Successional Trends Following Cultivation in Owens Valley, California. Poster Presentation, Ecological Society of America Meeting, Aug. 2005, Montreal.

Naumburg, E, Hubbard, P, Martin, D, McLendon, T. 2004. Effect of precipitation and groundwater depth on grass and shrub vegetation during two years in Owens Valley, CA. Poster Presentation, Ecological Society of America Meeting, Aug. 2004, Portland.