

Five BiGeA-UniBO Lectures on Spring Ecosystem Ecology



Dr Larry Stevens, Director of Springs Stewardship Institute
Each Wednesday, 1:00 – 2:00 pm, 15 November to 13 December 2023
Aula Ghigi, Via S. Giacomo 9, Bologna

**Seminars organized
and chaired by Prof.
Marco Cantonati**



Target audience: BiGeA-UniBO students, from Bachelor to PhD, and, in general, all those interested in spring ecosystems. Designed for those with general interest, as well as those with more technical backgrounds, this lecture series will provide a unique overview of an unrecognized, globally significant, and highly threatened aquatic biome.

Lecture 1: Springs Ecohydrogeology (November 15th, 2023)

Springs are the most biologically and socio-culturally important points in natural landscapes. The Springs Stewardship Institute's director, Dr Larry Stevens, will present an hour-long seminar on the extraordinary multi-dimensionality of spring ecosystems, their ecosystem ecology, and socio-cultural significance.

Lecture 2: Springs Biota and Ecosystem Ecology (November 22nd, 2023)

Springs support enormously productive and diverse assemblages of obligatory and facultative aquatic, wetland, riparian, and upland microbial, plant, and animal species. In this lecture, Dr Stevens will present recent findings on the natural history and ecology of springs biota. He will describe the extraordinarily tight "packing" of species into spring habitats, and use SSI's extensive inventory data to explain the anomalous rarity of truly springs-dependent plant species, the abundance of springs-endemic invertebrates, and the complex relationships of selected springs-dependent vertebrates. This seminar will emphasize differences among spring types and springs function as "keystone ecosystems" – small but ecologically interactive habitats that influence the health of adjacent uplands and populations.

Lecture 3: The Socio-cultural and Economic Significance of Spring Ecosystems (November 29th, 2023)

In this lecture Dr Stevens will present information on human use, occupation, and exploitation of spring ecosystems. Human evolution was intimately tied to springs, as demonstrated by paleohydrological reconstruction of the Olduvai Gorge in Tanzania. We humans have both intensively used and revered springs throughout the habitable world ever since. While hunting and gathering cultures tend to avoid long-term occupation of springs, agricultural and industrial economies generally exploit them in situ. When economic exploitation exceeds cultural valuation, habitat quality and sustainability of springs usually declines. Dr Stevens will discuss perspectives of indigenous cultures, various religions, and the roles of springs in human history, art, and modern times.

Lecture 4: Synthesizing Information and Knowledge about Springs (December 6th, 2023)

In this lecture Dr. Stevens will discuss springs information management (IM). Topics will range from early IM, documentation of traditional indigenous knowledge, sources and forms of historic and contemporary data, information storage and retrieval, the need for both ease of access and security of springs-related data, as well as ready reporting, and the tremendous advantage of relational frameworks in multi-dimensional IM, which allows users to investigate basic relationships and ask novel questions. He will provide an overview of SSI's data portal, Springs Online (<https://www.springsdata.org>) and how it is being used by more than 1,500 springs managers and researchers around North America.

Lecture 5: Sustainable Springs Stewardship and Conservation (December 13th, 2023)

Springs may be humanity's most sustainable ecosystem if the supporting aquifers are intact and functioning. In this final lecture, Dr Stevens will describe the need for improved stewardship of springs at all spatial scales. He will describe methods of assessment of spring ecosystem integrity and variation in management options at different types of springs. He will present several case studies in which ecological assessment lead to sustainable management of springs, while still allowing for ecosystem goods and services provisioning.