

## Get to Know Your Instructors

### Earth Sciences



**Putu Ustriyana, DDS, PhD in Polymer Science (Environmental Sciences, Public Health) – University of California, San Francisco**

My name is Putu Ustriyana and I am a scientist at UCSF. It has been a wonderful experience teaching Troop 200 Environmental Science and Public Health merit badges since we started sheltering-in-place. I look forward to using an integrated approach of Environmental Science to connect different subjects in the Earth Sciences Track. The interdisciplinary field of Environmental Science offers a general perspective of the Earth system and how its components interact with each other. I am excited to meet with inquisitive and bright students, listen to their ingenious ideas, and work with them on their original and creative solutions to the current environment-related issues.

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**Bruce McGurk, PhD in hydrology, MS in environmental planning, BS in wildlife biology (Water and Soil Conservation) – career as a research hydrologist, Sierran snowmelt forecaster, reservoir operator**

I have spent my life studying snow, weather, and rivers in the mountains, and applying that knowledge to teach others and to efficiently operate reservoirs to generate renewable power and provide water to people. My goal has been to manage these facilities to also benefit the aquatic ecosystem and the human users such as boaters and anglers. It has been a joy to demonstrate that these goals are not mutually exclusive, and to have many others adopt practices I pioneered. I have also enjoyed the 25 years I have been working with Scouts as a Scoutmaster, Eagle Coach, STEM counselor, and Merit Badge counselor. By understanding Environmental Science, Sustainability, and Soil and Water Conservation principles, people learn how their world works to supply them goods and services, and also learn how their actions can focus on taking care of their environment and earth. Too many people act without being aware of the effects of their consumption, habit, transport, and eating. Earth Science is a field that ties together the physical and biological processes that produce the world we live in, the water we drink, air we breathe, and food we eat. A deep understanding of how your life affects those processes, and how you can work to minimize the adverse impacts from your time here, and multiply the positive outcomes of your actions.

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**Caroline Tsuyuki, PhD in Biochemistry (Chemistry and Sustainability) – Chemistry Curriculum and Training Specialist, PASCO scientific; Advanced Sciences Professor and Teacher; GGAC Board Member and STEM Committee; National BSA STEM Advisory Board**

I am an Assistant Scoutmaster with Troop 200G, a founding member of the council STEM Committee and a member of the National STEM Advisory Committee of Boy Scouts of America. I am a Biochemist and Molecular and Cellular Biologist by profession but am currently involved in Science Curriculum development. I recently published an Advanced Chemistry with Inquiry manual and am currently involved in writing a laboratory manual for Earth & Environmental Science. I will be teaching the Sustainability and Chemistry MB classes in this series. Both subjects are of great interest to me. Sustainability requires living within our Earth's ability to regenerate the things we need to live. Chemistry, the study of matter and the changes it undergoes, is closely tied to our environment. Good chemistry supports and sustains the environment. Bad chemistry destroys it. In the Chemistry MB class, we will learn about both.

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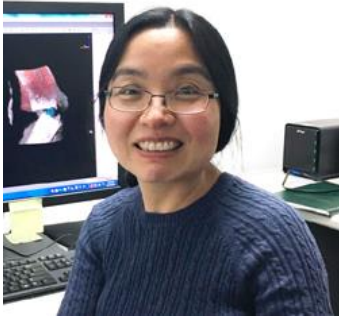
**Robert Raffel, MHA (Nature) – Naturalist, Scout Leader**

I am Robert Raffel. One lens to view who I am is through nature. I have loved nature ever since I was a toddler and would look for turtles in my backyard. That grew into a love of reptiles and later birds, trees, and flowers. It was nature that drew me into scouting since it provided me a chance to spend time in the woods and hang out with other youth who had similar interests. I majored in biology, but later got a Masters and pursued a career in the business of healthcare. My recent retirement was driven largely by the desire to refocus my life around my interest in nature.

It is always a pleasure to share my love of nature with others. Knowing about nature and understanding it is a critical component for addressing the biggest threat to civilization as we know it which is climate change.

STEM is helpful, but insufficient. Today, we have the technology and knowledge to stop climate change which includes protecting the natural world. What we lack is the collective will to do so. For example, if everyone became a vegetarian, it would have a huge impact and solve many other global issues as well. What needs to happen is clear whether it be what we eat or the fuels we consume. The problem is that our current economic and political systems are designed around short-term self-interest (greed) and maintaining the status quo. Those characteristics will not permit the necessary change within the time frame that is required. Since our politics and economics are a reflection of our beliefs and understanding of our place in the world, philosophy and religion are also key. To use business parlance, to survive, humans need to "re-invent" themselves as a species. Not the bricks and mortar, but who we are fundamentally.

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**Misun Kang, PhD in Geology (Nature) – University of California, San Francisco**

I am a scientist at UCSF and study normal and pathological mineral forms in mice and humans using various imaging and analysis techniques including light, electron microscopy, X-ray micro-computed tomography, and X-ray fluorescence microscopy. Geology is the primary Earth Science, and is the “skin” and substrate that defines the Earth. Geology is the study of physical and chemical processes of Earth since its origin and “naturally” fits into Earth Sciences.

Over the years, I have co-taught scouts geology in mini UC-Ignite and Nature MB programs. I enjoy teaching geology since it makes me think about our planet's history; how life/earth formed and evolved to its current status from an atomic to global scale. I was so pleased that the scouts worked hard to understand information from multiple subjects and put everything together to make connections.