



# PCPG

Pennsylvania Council of Professional Geologists  
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## ***The Big Picture: Geologic and Environmental Applications of Drones***

September 28, 2018

Chester County Public Safety Training Campus  
137 Modena Rd., Coatesville, PA 19320

### **Program Outline**

Unmanned Aerial Systems (UAS, or drones) have rapidly become a new tool for the Professional Geologist and Environmental Professional involved in site investigations and resource studies. In addition to providing a big picture view of a project site, drone imagery and 3-dimensional photogrammetry can be used to document site environmental conditions, evaluate structural geology, conduct fracture trace analysis, monitor sinkholes and subsidence, record mass movement, delineate wetlands, and find paleontological specimens. Drones equipped with scientific instruments such as telephoto lenses, thermal cameras, multispectral imagers, geophysical devices, and chemical sensors are capable of taking precise scientific measurements in locations inaccessible by traditional methods. This course will discuss case studies where drones have been used to support or advance typical investigative and study approaches, demonstrate aerial photographic techniques, and apply photogrammetry for reliable project mapping and modeling. The course will also cover federal drone regulations, privacy issues, and industry best practices. Attendees will receive hands-on training using provided, commercially-available aircraft.

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|-------------|---|
| 7:30-8:00   | Registration, Networking, Refreshments  |
| 8:00-9:20   | Introduction and Geologic and Environmental Applications of Unmanned Aerial Systems (Helmke/Bochicchio) |
| 9:20-9:30   | Break   |
| 9:30-10:50  | UAS Rules, Regulations, and Privacy Laws (Ennis)  |
| 10:50-11:00 | Break   |
| 11:00-12:00 | UAS Best Practices for Geologic and Environmental Investigations (Helmke)                               |
| 12:00-12:50 | Lunch   |
| 1:00-2:00   | Rotation 1  |
| 2:15-3:15   | Rotation 2  |
| 3:30-4:30   | Rotation 3  |
| 4:20-5:00   | Summary and Q & A   |

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**Each rotation will include one of three stations:**

**Station A:**

Geologic Photogrammetry and Aeronautics for Use in Geologic Environments (Classroom, Helmke)

**Station B:**

Conducting Aerial Mapping for Geologic Analysis (South Field, Bochicchio/Lyon)

**Station C:**

Special Geologic Operations with Zoom Camera and Thermal Imagery (Tactical Village, Ennis)

**Weather**

Flight training may be modified due to weather conditions.

**About Our Instructors**

**Martin Helmke, PhD, P.G. (West Chester University of Pennsylvania)**

Dr. Helmke is President Elect of PCPG, a Full Professor of Hydrogeology in the Department of Earth and Space Sciences at West Chester University of Pennsylvania, and President of Helmke Hydrogeologic, LLC. Dr. Helmke holds a PhD in Geology and Water Resources from Iowa State University and has 21 years experience applying fixed-wing and multi-rotor UAVs for geologic research. He is an FAA-licensed drone pilot dedicated to promoting the use of drones for geologic and environmental investigations.

**John J. Ennis, Esq., P.G. (Groundwater and Environmental Services, Inc.)**

Mr. Ennis is a Pennsylvania PG and attorney, and is currently Senior Vice President and General Counsel for Groundwater & Environmental Services, Inc. (GES). He is also an FAA Certified Remote Pilot and Flight Operations Manager for GES' sUAS service line that includes 15 FAA Certified Remote Pilots located throughout the United States.

**Daniel Bochicchio, GIT (Groundwater and Environmental Services, Inc.)**

Whether in research, mineral exploration, or environmental consulting, Mr. Bochicchio keeps his eyes on the horizon for the most modern technological innovation that will guide his fellow geologists forward in order to advance the field. He developed the West Chester University drone program during his masters work and thereafter started his own drone services company, Skybernetics. He recently joined the geo-drone team at GES. When he's not flying drones or consulting you can try to spot him climbing a cliff face somewhere in a far away country.

**D. Matt Lyon, Construction Manager, Aircraft Systems Manager (Groundwater and Environmental Services, Inc.)**

Matt has worked at Groundwater & Environmental Services, Inc. (GES) for 22 years. He is a FAA Certified Remote Pilot and Aircraft Systems Manager for GES' sUAS fleet of ten DJI drones. Aircraft models include the Phantom 4, Inspire 2 and the Matrice 210.