



## Back-to-back workshops at 2 convenient locations

### **GPS:** Using your Mobile Device for High-Precision GPS Forestry Data Collection

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### **UAV:** Do-It-Yourself Accurate Drone Mapping in Natural Resources



**Each location will offer both topics.  
Pick the session that is most convenient.**

**1** May 15-16, 2017 • Hotel RI (Red Lion) • Olympia, WA

**2** May 18-19, 2017 • Holiday Inn Eugene/Springfield • Springfield, OR

## Using your Smartphone/Tablet for High-Precision GPS Data Collection in Forestry and Natural Resources

### You don't need a dedicated handheld GPS receiver any longer

Each location offers the same agenda.

- 1** May 15, 2017 • Hotel RL (Red Lion) • Olympia, WA
- 2** May 18, 2017 • Holiday Inn Eugene/Springfield • Springfield, OR

### Workshop Agenda

The workshop will explore the growing trend of using smartphones and tablets in the field as GPS/GIS data collection devices (BYOD – Bring Your Own Device). Carrying a specialized “GPS handheld” is no longer necessary to collect high-accuracy, feature-rich data.

How accurate is the GPS chip inside your iPad? How can you get sub-meter or centimeter accuracy using your iPad, iPhone or Android device? Which software should you use on your smartphone/tablet to collect GPS/GIS data?

The workshop will also discuss the basic concepts of how GPS works and how GPS and GNSS will change significantly over the next few years. Attendees are encouraged to bring their own mobile devices, including legacy GPS handhelds, for an interactive workshop.

#### 8:30am

##### Introduction and Overview

How did mobile technologies evolve? Looking at the legacy of devices and operating systems (Windows Mobile, Blackberry, iOS and Android).

#### 8:45am

##### BYOD – The Future of Field Data Collection

- What is BYOD (Bring Your Own Device)?
- Why BYOD makes sense.
- When BYOD doesn't make sense.

#### 9:30

##### GPS/GNSS receivers: Basic operation & technology trends

- How does GPS work?
- How accurate is GPS?
- Different categories and capabilities of GPS receivers. Recreational vs. Professional
- GPS Advancements: What can you expect in the next couple of years

#### 10:30 Break

#### 10:45am

##### A look at BYOD hardware and software:

- iOS, Android, Windows smartphones, and tablets.
- Screen readability, GPS accuracy, ruggedness, expandability, and flexibility.

- Software.
  - Open source (free) vs. paid. Esri, tMap, Avenza, GIS Cloud, etc.
  - Cloud vs. on-device software. To download or not to download?
- What combination works best for you?

#### 12:00 Lunch

#### 1:00

##### GPS mapping fundamentals and troubleshooting

- Why doesn't my data line up?
- Map projections and datums.
- GIS data collection structure. Points, lines and polygons.
- Field data collection forms.
- Linking photos to data.

#### 2:30 Break

#### 2:45

##### Using background map data, sources and cost.

- Imagery (aerial/satellite/UAV photos).
- Vector (roads, parcels, contours, etc.).
- Sources of free and paid data.

#### 3:15

##### Wrap up and Q&A

#### 4:00pm Adjourn

#### About the Instructor:

**Eric Gakstatter** has been involved with GPS for more than 25 years as a product manager, consultant and power user of GNSS technology. He has used GNSS receivers on six continents.

Since 2006, Eric has been the high-precision GNSS editor for GPS World magazine, writing over 100 technical articles and speaking at numerous conferences in North America, Europe, Africa and Australia. Eric's consulting firm, Discovery Management Group <[www.gps-mapping.com](http://www.gps-mapping.com)>, is located in a suburb of Portland, Oregon, where he operates a GNSS lab to test GNSS receivers, mobile devices and GPS/GIS data collection workflows.

# Do-It-Yourself Accurate Drone Mapping in Natural Resources

## Centimeter-accurate data with a \$1,500 drone

Each location offers the same agenda.

- 1** May 16, 2017 • Hotel RL (Red Lion) • Olympia, WA
- 2** May 19, 2017 • Holiday Inn Eugene/Springfield • Springfield, OR

### Workshop Agenda

You no longer need a traditional FAA Pilot license or a \$50,000 drone to start using UAVs for mapping and inspection. The FAA rules changed last summer so it's much easier to start flying now. Consumer drones are getting better, faster, less expensive and easier to fly.

The workshop will explore:

- The current FAA rules for flying drones and what it takes to obtain a drone pilot certificate.
- Discussion about different types of drones, costs, and capabilities.
- Examples of products and data you can produce with an inexpensive drone.

The workshop will discuss the basic concept of how UAVs work and how they will change over the next few years. Join a lively discussion on collecting data with drones. You can now put a drone in your pickup along with the rain gear.

Attendees are encouraged to bring their own drones for an interactive discussion.

Static display of drones will be available at the workshop.

#### 8:30am

##### Introduction and Overview

How did mobile technologies evolve? Looking at the legacy of devices and operating systems (Windows Mobile, Blackberry, iOS and Android)

#### 8:45am

##### Drone Rules

- How to obtain a drone pilot certificate.
- 20 hours of on-line study. Common test questions. Local test centers.
- Drone flying rules. Where can you fly and not fly?
- Flying by yourself, flying in the woods and around people.
- Hobby vs. business flying.

#### 10:30 Break

#### 11:00am

##### Drone Technology: Capabilities, cost and pros/cons

- Airframes
  - Rotorcraft, fixed-wing, hybrid.
  - Flight controller (tablet/smartphone vs. proprietary).
- Airframe pros/cons.
- Batteries.
- Operating differences.

#### 12:00 Lunch

#### 1:00

##### Drone Technology (continued)

- Mission planning software
  - Third-party vs. manufacturer-supplied.
  - iOS vs. Android vs. Windows.
- Sensors
  - RGB cameras (photogrammetry, Phodar point clouds).
  - Lidar, thermal, NDVI (Normalized Difference Vegetation Index).
- Image processing software
  - Matching images effectively and accurately.
  - Using ground control points.
  - Cloud processing vs. Stand-alone processing.
  - Producing orthophotos, DEM (Digital Elevation Model)/DSM (Digital Surface Model), contours, volumes and 3D models.
  - Integrating into GIS (Esri) systems.

#### 2:30 Break

#### 2:45

##### The Possibilities. What's Possible with a \$1,500 UAV?

- Orthophoto example • Elevation contour example.
- 3D model example. • DEM/DSM example. • Volume example.

#### 3:15

##### Wrap up and Q&A

#### 4:00pm Adjourn

#### About the Instructor:

**Eric Gakstatter** has been involved with UAVs since 2012. He holds an FAA Private Pilot certificate and an FAA 333 Exemption to fly UAVs for commercial operations. He's tested UAVs from a wide variety of manufacturers using several different sensors.

He has presented at many conferences and written many articles for Geospatial Solutions on the value of using inexpensive UAVs to produce high-accuracy data.

Eric's consulting firm, Discovery Management Group, [www.gps-mapping.com](http://www.gps-mapping.com), is located in a suburb of Portland, Oregon, where he tests various UAVs and processes UAV imagery using specialized software and high-performance computers.

## REGISTRATION FORM

NAME \_\_\_\_\_

ORGANIZATION AND AFFILIATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

EMAIL \_\_\_\_\_ TEL \_\_\_\_\_

### REGISTRATION

I will attend: (pick 1 or 2 workshop dates)

GPS in Olympia	May 15	<input type="checkbox"/>
UAV in Olympia	May 16	<input type="checkbox"/>
GPS in Springfield	May 18	<input type="checkbox"/>
UAV in Springfield	May 19	<input type="checkbox"/>

#### One workshop any date:

BEFORE May 9, 2017      \$225      \_\_\_\_\_

AFTER May 9, 2017      \$300      \_\_\_\_\_

#### Two workshops any date and same attendee:

BEFORE May 9, 2017      \$375      \_\_\_\_\_

AFTER May 9, 2017      \$450      \_\_\_\_\_

### PAYMENT

#### 1. Please make check payable to:

WFCA  
4033 SW Canyon Rd. • Portland OR 97221  
503-226-4562 • 888-722-9416 • FAX: 226-2515

2. Purchase order # \_\_\_\_\_

3. Charge to:      MC      VISA      AmEx  
(please circle)

Account # \_\_\_\_\_

Expiration Date \_\_\_\_\_ Security Code \_\_\_\_\_  
(on back of card)

4. Register online at [www.westernforestry.org](http://www.westernforestry.org)

Questions? Give us a call or email.



Western Forestry and Conservation Association  
Call 888-722-9416 or 503-226-4562  
or [melinda@westernforestry.org](mailto:melinda@westernforestry.org)

### Workshop Locations

- 1** Session 1 will be held at the Hotel RL (Red Lion) at 2300 Evergreen Park Dr SW, Olympia, WA (360) 943-4000
- 2** Session 2 will be held at the Holiday Inn Springfield/Eugene at 919 Kruse Way, Springfield, OR, (541) 284-0707

### Lodging Information

- 1** Session 1: A reduced rate of \$129 plus tax is available at the Red Lion by mentioning Western Forestry and Conservation and calling (360) 943-4000. The reduced rate will be subject to availability after 4/24/2017
- 2** Session 2: A reduced rate of \$106 plus tax is available at the Holiday Inn by mentioning Western Forestry and Conservation and calling (541) 284-0707. The reduced rate will be subject to availability after 5/3/2017

### Registration

The registration fee for any one workshop is \$225 if received by May 9, 2017 or \$300 after May 9. The registration fee for any two workshops, attended by the same person, is \$375 if received by May 9, 2017 or \$450 after May 9. The registration fee includes a book of speaker materials,

lunch and refreshments. Checks should be made payable to Western Forestry and Conservation Association. Purchase orders, VISA/MasterCard, and American Express are accepted. Tax id # 930-331-712. Any questions: 503-226-4562.

Registration is available at [www.westernforestry.org](http://www.westernforestry.org)

### Cancellations

Cancellations received by May 9, 2017 are subject to a 15% service charge. Cancellations received after that time will be charged the entire registration fee, but substitutions are always welcome.

### Society of American Foresters CFE Credits

Attendees will be eligible for CFE credits through the Society of American Foresters.

### Registration questions?

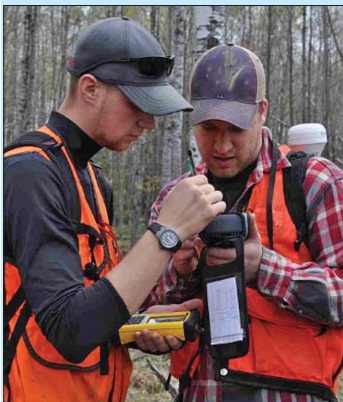
Call Melinda at (888) 722-9416 or (503) 226-4562 or [melinda@westernforestry.org](mailto:melinda@westernforestry.org)

**Western Forestry and Conservation Association**  
4033 SW Canyon Rd., Portland, OR 97221  
503-226-4562 • 888-722-9416 • Fax: 503-226-2515

Register online at [www.westernforestry.org](http://www.westernforestry.org)

## GPS: Using your Smartphone/Tablet for High-Precision GPS Data Collection in Forestry and Natural Resources

## UAV: Do-It-Yourself Accurate Drone Mapping in Natural Resources



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