Credit Information

Aerial Mapping Technologies and Procedures

This webinar is open to the public and offers 7.0 PDHs to professional engineers and land surveyors, and 7.0 HSW continuing education hours to landscape architects licensed in most states. Land surveyor course approval is currently pending in Tennessee. HalfMoon Education is not seeking approval for land surveyors in New Jersey or Rhode Island, or for landscape architects in Florida.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida (Provider No. 0004647), Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700) and North Carolina (S-0130).

HalfMoon Education is an approved continuing education sponsor for land surveyors licensed in Indiana (License No. CE21700059), Maryland and North Carolina (S-0130).

HalfMoon Education is deemed an approved continuing education sponsor for New York engineers and land surveyors via its registration with the Landscape Architect Continuing Education System (Regulations of the Commissioner §68.14(i)(2), §68.15(i)(2). Other states do not preapprove continuing education providers or courses.

GNSS Positioning

This webinar is open to the public and offers 6.0 PDHs to professional engineers and land surveyors in most states. HalfMoon Education is not seeking approval for land surveyors in New Jersey or Rhode Island. This course is not approved for continuing education credit for engineers or land surveyors in New York.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida (Provider No. 0004647), Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700) and North Carolina (S-0130).

HalfMoon Education is an approved continuing education sponsor for land surveyors licensed in Indiana (License No. CE21700059), Maryland and North Carolina (S-0130). The Tennessee Board OF Examiners for Land Surveyors has approved this course.

Art of Retracement for Surveyors

This webinar is open to the public and offers 6.0 PDHs/continuing education hours to civil engineers licensed in all states, and 6.0 PDHs to land surveyors licensed in all states except New Jersey. Course approval is applied for and pending for engineers in New York, and land surveyors in New York, and Delaware.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida (Provider No. 0004647), Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700) and North Carolina (S-0130).

HalfMoon Education is an approved continuing education sponsor for land surveyors licensed in Indiana (License No. CE21700059), Maryland and North Carolina (S-0130).

The Florida Department of Agriculture and Consumer Services has assigned this course number 10050 for surveyors.

HalfMoon Education is not seeking course approval for New Jersey land surveyors.

Course completion certificates will be awarded to participants who complete the webinars in their entirety, respond to all the verification prompts during the instruction, and earn a score of 80% on the quizzes that follows the instruction (multiple attempts allowed).

December Land Surveying Webinars
- Aerial Mapping Technologies and Procedures
- GNSS Positioning
- Art of Retracement for Surveyors

HalfMoon Education Inc.
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Live, Interactive Webinars

Aerial Mapping Technologies and Procedures
- Monday, December 13, 2021 | 8:30 am - 5:00 pm CST

GNSS Positioning
- Thursday, December 16, 2021 | 9:00 am - 4:30 pm CST

Art of Retracement for Surveyors
- Tuesday, December 21, 2021 | 8:30 am - 3:30 pm CST

To register, view detailed presenter biographies, and see other learning opportunities, please visit:

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HalfMoon Education Live Webinars

December Land Surveying Webinars

Aerial Mapping Technologies and Procedures

Monday, December 13, 2021 | 8:30 am - 5:00 pm CST

Credits: Professional Engineers: 7.0 PDHs
Landscape Architects: 7.0 HSW CE Hours
LA CES: 7.0 HSW PDHs (FL – No Credit Offered)
Land Surveyors: 7.0 PDHs
(TN Pending Approval; NJ, RI – No Credit Offered)

GNSS Positioning

Thursday, December 16, 2021 | 9:00 am - 4:30 pm CST

Credits: Professional Engineers: 6.0 PDHs (NY – No Credit Offered)
Land Surveyors 6.0 HSW CE Hours
(NY, NJ, RI – No Credit Offered)

Art of Retracement for Surveyors

Tuesday, December 21, 2021 | 8:30 am - 3:30 pm CST

Credits: Civil Engineers: 6.0 PDHs
Land Surveyors: 6.0 PDHs in Most States, 6.0 Florida CE Hours
(Pending Approval in New York and Delaware)

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Aerial Mapping Technologies and Procedures

Monday, December 13, 2021 | 8:30 am - 5:00 pm CST (incl. a 60-min break)

Tuition: $289 per registrant, $239 per registrant for three or more

Credits: Professional Engineers: 7.0 PDHs
Landscape Architects: 7.0 HSW CE Hours
LA CES: 7.0 HSW PDHs (FL – No Credit Offered)
Land Surveyors: 7.0 PDHs
(MO and TN Pending Approval; NJ, RI – No Credit Offered)

Agenda

Overview of Aerial Mapping Technologies
- Manned aircraft vs. unmanned aircraft systems (UAS)
- UAS platforms: fixed-wing and rotorcraft
- UAS photogrammetry
- UAS LiDAR

Commercial UAS Applications
- Agriculture
- Architecture and construction
- Engineering
- Environmental monitoring and compliance
- Defense and public safety
- Marketing, media and public relations
- Infrastructure development and maintenance

Mapping Using UAS
- Software set-up
- Preflight planning
- Flight operations and considerations
- Post-processing

UAS Data-Processing Software
- Pix4D
- DroneDeploy
- Autodesk
- Agisoft
- Others

Photogrammetry Demonstration/Case Study
- Software demonstration
- Working with control points
- Deliverables

FAA Commercial UAS Regulations
- Commercial/recreational UAS
- Remote pilot requirements
- UAS requirements
- Airspace requirements
- Operating rules

FAA Part 107 Remote Pilot License
- When required
- Preparing for the test
- Where to take the test

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GNSS Positioning

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Credits: Professional Engineers: 6.0 PDHs (NY – No Credit Offered)
Land Surveyors 6.0 HSW CE Hours
(MO Pending Approval; NY, NJ, RI – No Credit Offered)

Agenda

Observation Modes
- Absolute positioning
  - Autonomous
  - Precise point positioning (PPP)
  - Differential GPS (DGPS)
- Relative positioning
  - Phase differencing
- Kinematic
- Static
  - CORS
  - Atop a tripod
  - Static post-processing and OPUS
- Real-time
  - Real-time kinematic
  - Real-time network

Independence of Observations: How Long Should We Wait?
- What is independence? What is correlation? Bias?
- Occupation duration
- Examples of occupation duration with various epoch rates
- Discussion of the constellation
  - Orbital planes, slots, overview of SVs, 12-hr orbital period
- Heighting example

Error Budget
- Range-pole centering error
- Multipath
- Geometry
  - Dilutions of precision
- Environment
  - Ionosphere → multi-frequency receivers
  - Troposphere
  - Signal-to-noise ratio
- Ephemeris
  - Positioning discussion: trilateration
  - Control → orbits
  - Predicted (broadcast) vs. modeled (precise)
  - Comparison of ephemeris accuracies
    - Ranging
  - Overview of how ranging works
  - C/A code, P code
  - Phase observable

To the Future
- Reference frames, geodesy
  - NAD 83 non-geocentricity, WGS 84, ITRF
  - NATRF 2022
  - Time-dependent positioning, Stable North American Ref. Frame (SNARF)
- GPS modernization
  - L1C, L2C, L5
  - New navigation message

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Credits: Civil Engineers: 6.0 PDHs
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(Pending Approval in New York, Missouri and Delaware)

Agenda

- Definitions
- Retracement boundary survey
- Original boundary survey
- Introduce flowchart
  - Intent – the Holy Grail
    - Determining if there was an original survey
- Yes, there was an original survey
- The surveyor's responsibility – follow in the footsteps
- The surveyor's challenges
  - Identifying the best evidence of intent
  - Determining the best evidence of the original survey
    - Direct
    - Indirect
    - Determining the acceptable precision of indirect evidence
    - Summarizing intent and direct and indirect evidence
- No original survey (or I don't know if there was an original survey)
  - Retracing when there was no original survey
    - Determining the best evidence to rely upon
- Ambiguities
  - Definitions
    - Patent
    - Latent
- Explaining/solving patent ambiguities in the legal description
- Explaining/solving latent ambiguities by exploring and analyzing extrinsic evidence
- Analyzing the evidence and applying the appropriate boundary law principles
- Potential conflicts independent of the resolved boundary
- Completing the survey
- A surveyor's role in boundaries

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Faculty

Aerial Mapping Technologies and Procedures

Michael Raymond *SkyCam Drone Service*

GNSS Positioning

Dr. Thomas H. Meyer *University of Connecticut*

Art of Retracement for Surveyors

Gary Kent *Schneider Geomatics in Indianapolis*

(See course listings online for full presenter biographies)

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