

Credit Information

GNSS Positioning

This webinar is open to the public and offers 6.0 PDHs/continuing education hours to engineers licensed in most states, and 6.0 PDHs to land surveyors licensed in most states.

This educational activity has been evaluated and accredited by The Practicing Institute of Engineering for 6.0 PDHs. It is deemed approved for New York engineers and land surveyors via this accreditation (Regulations of the Commissioner §68.14(i)(2)).

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. CE10600325), Maryland and North Carolina (S-0130).

The Florida Department of Agriculture and Consumer Services has assigned this course number 10185 for surveyors.

The Tennessee Board of Examiners for Land Surveyors has approved this course for 6.0 PDHs.

This course has been submitted to the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects for 6.0 PDUs; approval is currently pending.

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

Visit this course listing at www.halfmoonseminars.org for updates on pending credits. Completion certificates will be awarded to participants who complete this event and earn a passing score (80%) on the quiz that follows the presentation (multiple attempts allowed).

How to Apply for a Letter of Map Amendment, Start to Finish

This webinar is open to the public and offers 2.0 PDHs to professional engineers and land surveyors 2.0 HSW continuing education hours to landscape architects in all states that allow this learning method. Please refer to specific state rules to determine eligibility.

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HalfMoon Education is an approved continuing education sponsor for land surveyors licensed in Indiana (License No. CE10600325), Maryland and North Carolina (S-0130).

The Landscape Architecture Continuing Education System has approved this course for 2.0 HSW PDHs. Only full participation is reportable to the LA CES.

The Florida Department of Agriculture and Consumer Services has assigned this course number 10307 for surveyors.

The Tennessee Board of Examiners for Land Surveyors has approved this course for 2.0 PDHs.

This course has been submitted to the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects for 2.0 PDUs; approval is currently pending.

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

This webinar has been approved by the Association of State Floodplain Managers for 2.0 CECs for floodplain managers.

Visit this course listing at www.halfmoonseminars.org for updates on pending credits. Completion certificates will be awarded to participants who complete this event and earn a passing score (80%) on the quiz that follows the presentation (multiple attempts allowed).

Surveying/Mapping Webinars

- GNSS Positioning
- How to Apply for a Letter of Map Amendment, Start to Finish

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Live, Interactive Webinars

GNSS Positioning

- Tuesday, July 26, 2022 | 8:30 am - 3:20 pm CDT

How to Apply for a Letter of Map Amendment, Start to Finish

- Thursday, July 28, 2022 | 10:00 am - 12:10 pm CDT

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

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HalfMoon Education Live Surveying/Mapping Webinars



GNSS Positioning

Tuesday, July 26, 2022 | 8:30 am - 3:20 pm CDT

Credits: Professional Engineers: 6.0 PDHs
Land Surveyors: 6.0 PDHs (in Most States)

How to Apply for a Letter of Map Amendment, Start to Finish

Thursday, July 28, 2022 | 10:00 am - 12:10 pm CDT

Credits: Land Surveyors: 2.0 PDHs/CE Hours in Most States
Floodplain Managers: 2.0 ASFPM CECs
Landscape Architects: 2.0 HSW CE Hours
Floodplain Managers: 2.0 ASFPM CECs
LA CES: 2.0 HSW PDHs

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GNSS Positioning

Tuesday, July 26, 2022 | 8:30 am - 3:20 pm CDT (incl. a 60-min break)

Tuition: \$319 per registrant, \$289 per registrant for two or more

Agenda

Introduction and History

- History of satellite-based navigation/positioning
 - SPUTNIK I, Transit, GPS, NAVSTAR
- Terms and nomenclature
 - GNSS, GPS, space vehicle (SV),
- GNSS system architecture (segments)
 - Control segment, monitor stations, master control station
- Principles of system operation
- Current status of GNSS
 - Number of SVs and operational status, benefits and drawbacks

GNSS Positioning Orbits and Ranging

- Ranging overview
 - Trilateration
- Positioning equations
 - Range equation 2-D, Range equation 3-D, 3-D Trilateration
- Orbits
 - Determining position of SV's, ephemeris, satellite laser ranging (SLR)
- Time
 - Kepler's Laws of Planetary Motion, elapsed time = range
 - Time bias
- Code-based ranging
- Carrier phase-based ranging

Timing Codes and Carrier Phase

- Waves and GPS: signal structure
 - Terminology: frequency, channel, band, five frequencies: L1-L5, L1c and L2c
 - L-Band, GPS Bands
- Timing codes
 - C/A-Code and P-Code, code phase, timing code chips = clock ticks, psuedorange
- Ranging by carrier phase
- Interferometry
- Integer ambiguity

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Credits: Professional Engineers: 6.0 PDHs
Land Surveyors: 6.0 PDHs (in Most States)

Geodesy and GNSS

- Control coordinates from CORS
- Terminology: phase center, phase center offset
- Antenna calibration
- Position and velocity
 - Antenna reference point
- NAD27, NAD83, WGS84
- Tectonic plate motion

GNSS Accuracy and Precision

- Precise point positioning (PPP)
- Differential GPS (DGPS)
- Phase differencing
- Static vs. kinematic
- Continuously operating reference station (CORS)
- Real-time positioning
- Real-time Kinematic (RTK)
- Advanced continuously operating reference network (ACORN)
- Practical considerations

Presented by

Dr. Thomas H. Meyer *Ph.D.*

Dr. Meyer was awarded a Ph.D. degree from Texas A&M University in College Station, Texas in 1998, where he was a research associate in the Mapping Sciences Laboratory. He now is a professor of Geodesy in the Department of Natural Resources and the Environment at the University of Connecticut, where he teaches courses in geomatics, GNSS and plane surveying, geodesy, and geospatial analysis in Python. Dr. Meyer is a member of ASCE and the Connecticut Association of Land Surveyors. He is also a past president of the New England Section of the ACSM and a fellow and the 2016/2019 president of the American Association for Geodetic Surveying. Dr. Meyer has published an undergraduate textbook on geodesy, numerous peer-reviewed journal articles, and is on the editorial boards of the *Journal of Surveying Engineering* (JSE) and *Surveying and Land Information Science* (SaLIS). He is a regular presenter at national meetings, giving workshops and seminars on numerous topics in geodesy, GNSS, and surveying. His most recent research projects include new formulations of low-distortion projections, and developing spatial statistical animal-movement models for mountain lions, bobcats, and salmon.

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Added Value:

Enhance your learning - a recording of this webinar will be available for attendees to stream online for two weeks after the program date.
(live webinar attendance required to receive credit)

How to Apply for a Letter of Map Amendment, Start to Finish

Thursday, July 28, 2022 | 10:00 am - 12:10 pm CDT (incl. a 60-min break)

Tuition: \$109 per registrant

Credits: Land Surveyors: 2.0 PDHs/CE Hours (in Most States)
Floodplain Managers: 2.0 ASFPM CECs
Landscape Architects: 2.0 HSW CE Hours LA CES: 2.0 HSW PDHs
Floodplain Managers: 2.0 ASFPM CECs

Agenda

- What is a Letter of Map Change, and why apply for one?
- The differences between map amendments, map revisions, and variances
- Required information to submit with a LOMA application, and where to find guidance, including:
 - Preparing a description of the area that is the focus of the LOMA application
 - Documenting sources of base flood elevation for a LOMA application
 - Reporting intervening high ground that affects a LOMA application
 - Determining what flood zone the site should be in, rather than the mapped one
- Online platforms for submitting map change applications: when to use one or the other
- Responding to requests for additional information

Presented by

Wendy Lathrop *PLS, CFM, President and Owner of Cadastral Consulting, LLC*

Ms. Lathrop is licensed as a professional land surveyor in New Jersey, Pennsylvania, Delaware, and Maryland, and as a professional planner in New Jersey. She holds a master's degree in Environmental Policy and has been involved in surveying since 1974 in projects ranging from construction to boundary to environmental land use disputes. Ms. Lathrop is also a certified floodplain manager through the Association of State Flood Plain Managers (ASFPM) and a certified floodplain surveyor through the New Jersey Society of Professional Land Surveyors. A former adjunct instructor at Mercer County College in New Jersey, she has also taught as part of the team for the licensing exam review course at Drexel University in Pennsylvania. Ms. Lathrop has been teaching seminars for surveyors since 1986 and has been writing articles for surveyors since 1983. She is a contributing editor for *The American Surveyor* magazine, and she has four articles included in the American Bar Association's text, *Land Surveys: A Guide for Lawyers and Other Professionals*. She and Stephen V. Estopinal, PLS, PE co-authored a book entitled *Professional Surveyors and Real Property Descriptions: Composition, Construction, and Comprehension*, published by John Wiley & Sons, Inc. in 2011. She is also on the faculty of GeoLearn, a web-based educational provider. Ms. Lathrop is a past president of the New Jersey Society of Professional Land Surveyors and of the National Society of Professional Surveyors, and she has served on the Board of Directors for the American Association for Geodetic Surveying.

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