

A MARLS Seminar for the Surveying Profession

- **OPUS Share/GPS on Bench Marks (2 PDH)**
September 7, 2017, Thursday 9:00 am - 11:00 am (see optional below.)
- **OPUS-Projects Manager's Workshop (12 PDH)**
September 7, 2017, Thursday 1:00 pm to 5pm and continued on September 8, 2017 from 8:00 am to 5 pm
Presented by William Stone, NOAA's National Geodetic Survey and Pamela Fromhertz
Rocky Mountain Regional Advisor, National Geodetic Survey, NOAA

Optional: attend the OPUS Share/GPS on Bench Marks (2 PDH) along with the OPUS-Projects Manager's Workshop (12 PDH) or opt out of the OPUS Share/GPS on Bench Marks part. No difference in registration pricing. We are just providing the 2 hours before the OPUS Projects Manager's Workshop for those interested in attending it also.

See page two for a synopsis of seminar and about the speakers.

LIMITED SEATING OF ONLY 35 PERSONS SO REGISTER EARLY!

BRING YOUR LAPTOPS - as you need to be on the internet to interact with the seminar.

Seminar Held at the Fairmont Hot Springs Resort, Fairmont, MT

Book your Sleeping Rooms at Fairmont Hot Springs Resort, Fairmont, MT

Phone: 800-332-3272 ask for "MARLS room block rate"

Or online reservation - To reserve rooms on-line with a special group ID and password. Once you get on our website at www.fairmontmontana.com then you can click on book now then the group tab. Once at the group tab, you can enter the group ID which is 20706 then the password which is 123.

Room block rate expires August 5, 2017

*Group Rate: \$129 + tax (single)
(Group name: MARLS)*

2nd Choice for hotel reservations:

*Marcus Daly Motel (\$85/night plus tax single) - code "MARLS"
Phone: 406-563-3411*

For further information or questions regarding registration please contact Kay at the following:

Phone: 406-892-4579 Cell: 406-253-5527

Email: kay@marls.com

Registration also available at www.marls.com

MARLS Refund policy

Prior to August 5, 2017 ~ 100% refund
After August 5, 2017 ~ no refund

**PLEASE REGISTER BY AUGUST 5, 2017
LIMITED SEATING FOR 30 ONLY
MANDATORY - BRING YOUR LAPTOP**

We sincerely hope that you will take time out from your busy schedule to attend this seminar and I encourage you to bring along your employees. We look forward to a successful seminar and hope that you will sign up today.

Bob Rux, Continuing Education Chair

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(14 PDH'S)

**Fairmont Hot Springs Resort
Registration ~ Please check the following:**

- \$255 - MARLS Active member**
- \$225 - MARLS Associate members**
- \$455 - MARLS Non-member**

Note: Registration fee includes lunch, breaks & thumb drive handouts.

NAME: _____

BUSINESS NAME: _____

ADDRESS: _____

CITY: _____

STATE/ZIP: _____

PHONE: _____

EMAIL: _____

Check # _____ Payable to MARLS

Bill government employer: _____

VISA/MC/AE/Discover:

Exp. Date _____ 3 Digit code _____

Authorized signature: _____

Registration receipt will be emailed to you.

LIMITED SEATING OF ONLY 35 PERSONS SO REGISTER EARLY!

PLEASE REGISTER BY August 5, 2017

MAIL REGISTRATION WITH FEE TO:

**MARLS
PO BOX 359
COLUMBIA FALLS, MT 59912**

PHONE IN REGISTRATION TO: 406-892-4579

EMAIL REGISTRATION TO: kay@marls.com



MARLS SPONSORED SEMINAR

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- **OPUS Share/GPS on Bench Marks (2 PDH)** September 7, 2017, Thursday 9:00 am – 11:00 am

As NGS transitions to new reference systems GPS data on Bench Marks will assist with the transformation tools. An easy way to collect the GPS data for NGS to use it is by sharing the data through NGS' Online Positioning User Service (OPUS). NGS has a GIS map and other visual map interfaces to determine what stations to observe. In this two hour workshop we will review the visualization tools, how to share your GPS data through OPUS, what is required and examine some GPS data collected on bench marks in the area.

- **OPUS-Projects Manager's Workshop (12 PDH)**

September 7, 2017, Thursday 1:00 pm to 5pm and continued on September 8, 2017 8:00 am to 5 PM

OPUS-Projects is an enhanced version of the popular NOAA/National Geodetic Survey utility, the Online Positioning User Service (OPUS). OPUS-Projects is a free, Web-based GPS multi-baseline processing and least-squares network adjustment package, providing simple visualization, management, and processing tools for survey projects including multiple survey marks and occupations. OPUS-Projects is a natural extension of OPUS, allowing surveyors, engineers, researchers, GIS and other geospatial professionals to position campaign-style GPS observations (geodetic networks) at a high level of positional accuracy, often achieving cm-level uncertainty relative to the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88).

By attending this workshop, you should have enough information to successfully use OPUS-Projects for your own geodetic network projects. The training is 1.5 days in duration, and by attending the full workshop you will become an authorized project manager for OPUS-Projects, allowing you free access to the program. The workshop includes both instructor lectures and hands-on participant work with a sample training project (each participant will be provided their own copy of the project), which demonstrates various capabilities of OPUS-Projects, including the ability to enhance a project's elevation accuracy by occupying published vertical control stations (aka bench marks). You are also welcome to bring your own GPS project data (survey-grade, L1/L2 GPS data) for processing during the workshop (the instructor can provide further details). You must bring a WIFI-enabled laptop computer with a current generation Web browser. The workshop will include an overview of geodetic concepts pertinent to optimal use of OPUS-Projects. The instructor will provide further details to all registrants prior to the workshop.



Pamela Fromhertz has been the NOAA National Geodetic Survey Colorado State Geodetic Advisor and transitioned to the Rocky Mountain Regional Advisor January 1, 2016. As a geodetic advisor, she interacts with the geospatial community at the local, state and federal levels, as well as with private industry, to educate and advise on the benefits of the National Spatial Reference System (NSRS) and how its datums, models, and tools may be utilized for user's programs and projects. Pam organizes numerous workshops and training opportunities, including training in Continuously Operating Reference Stations (CORS), NGS' Online Positioning User Service (OPUS), DS-World, precision digital leveling and Height Modernization (HT MOD). She has her M.S. in geodesy, photogrammetry, and GIS from the Ohio State University and a B.S. in geology with a math minor from Long Island. She has worked for the federal government for over 30 years.



William Stone is the Southwest Region Geodetic Advisor for NOAA's National Geodetic Survey (NGS). He assists the geospatial community throughout Arizona, New Mexico and Utah with proper use of the National Spatial Reference System. Stone has been with NGS since 1989, and he holds a BA in Physics from Bowdoin College and an MS in Physical Oceanography from the Scripps Institution of Oceanography. He lives in Santa Fe, NM.