CHANGE IS IN THE AIR 2015
ASPRS Unmanned Aerial Vehicle Technical Demonstration and Symposium – Reno, NV
By Jolene Hoffman, Land Surveyor, U.S.F.S.

Everything you want is on the other side of fear. – George Addair

The second annual UAS Mapping Symposium was a delightful collection of people, companies and educators who wrangled in their technological fears and stepped over the edge of what they have known to join in the excitement of the next chapter of unmanned flights. Held back by the gates of regulations, the Unmanned Aerial System industry is a race horse at the starting line. Since the first symposium just one short year ago, the FAA has begun to define regulatory parameters for Small UAS’s to operate in a commercial setting. Therefore, it seems appropriate to summarize the 2015 UAS Mapping Symposium from a standpoint of chronological progress.

Recap – 2014 UAS Symposium

Throughout the inaugural UAS Mapping Symposium, speakers presented their concepts in a “work-flow” manner thus, educating the audience in choosing the best equipment, software and data storage for specific projects. Beginning with the end in mind, we define the client and their desired end product. If the project requires mapping/monitoring over a large area (100 acres was often mentioned) then a fixed wing plane could be fitted with a camera and suitable sensors for the job. In a more vertical scenario like bridge inspections or monitoring an unstable high-wall at a mine, one would choose a rotary wing vehicle to best fit the mission as it can fly slowly vertical and stop to record areas of interest with more detail. At this time (Oct 2014), the major markets for UAS mapping emerged in farming and forestry, emergency response (natural disaster areas and wildland fire support), volume monitoring in construction and mining and physical infrastructure management (bridges, dams, etc.). Once the vehicle is chosen, then software and data storage can be considered. Depending on the complexities of a client’s needs, flight planning and post processing software options can be narrowed down. Data storage of high-resolution imagery can result in billions of pixels of image data that can be stored and compressed via “cloud” technology. From the cloud, select data can be extracted to fit the product delivered to the client and...
Of course all of this knowledge and work is useless if the plane cannot legally be flown. Last year the status of regulations for such operations was unknown, in fact most speakers just touched on the subject to reiterate that they didn’t know how or when the FAA would ultimately present such necessary guidelines but most remained hopeful. In the meantime, developing technology continued.

**Fast-Forward – 2015 UAS Symposium**

The momentum has not subsided but increased; two days for this year’s symposium wasn’t enough time to cover all the changes and progress in the UAS world. Thankfully, the slides from the majority of the presentations are uploaded to the event website for review as it is impossible to absorb everything the first time through. ([uasreno.org/conference-program/](http://uasreno.org/conference-program/))

The symposium was preceded with a full day UAS workshop led by Lewis Graham of GeoCue. Attendance exceeded seating capacity as the speakers provided a practical overview of small UAS hardware and software components to take a project from start to finish. The class was so full it prohibited the hands-on aspect that was originally intended but the workshop was not short of information and insights to fill in the gap, packing our brains full to the very end. No worries, as we all regrouped at the NoVi Lounge in the El Dorado Hotel to lighten our craniums at the welcome reception hosted by Drone Deploy. An eclectic mix of attendees and free drinks invited lively conversation and a fun dynamic atmosphere, the perfect kick-off to the next two days.

The following morning the exhibit hall was full of new and familiar faces standing next to the latest in UAS mapping technology and supporting products and services. The main difference this year is the federal regulatory environment is much closer to being established for legally flying these amazing machines giving companies and operators a more defined direction to move forward. Though still not a final product, the parameters proposed by the FAA brought to light previously unknown markets that quickly capitalized on the benefits flying and mapping with a small UAS brings to their business.

**How can you legally fly a drone for commercial purposes? Who is successfully flying a UAS in their business?**

In response to the exponentially growing interest in using sUAS for commercial purposes Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) grants the Secretary of Transportation the authority to approve certain small UAS’s to perform commercial operations on a case-by-case basis until the Small UAS Rule is finalized. Over 1,800 petitions for exemption to fly sUAS have been granted since September 2014 with the top ten requesting states being:

1. California
2. Florida
3. Texas
4. Illinois
5. Arizona
6. Pennsylvania
7. Colorado
8. Washington
9. New York
10. Virginia

Surprisingly, compared to the assumed UAS market demands from 2014:

1. Agriculture – Forestry/Farming
2. Emergency Response
3. Mining/Construction

The data compiled from the list of granted Section 333 exemptions looks more like:

1. Aerial Photography
2. Real Estate
3. Aerial Surveying
4. Aerial Inspection
5. Agriculture
6. Construction
7. Infrastructure Inspection
8. Emergency Management
9. Mining

Granted, this is just barely one year of data gathering and analysis which does not account for the industries flying without applying for the proper exemption, the organized assessment is notable. An additional point of interest in the data is that ninety percent of the vehicles registered are rotary wing systems and ten percent fixed wing. Upon review of the regulatory parameters, this fact makes sense. In order for operators who hold a Section 333 exemption to be granted a “blanket” Certificate of Waiver or Authorization
(COA) the flights must be conducted within the operational limits proposed in the FAA’s Small UAS Notice of Proposed Rule Making (NPRM). A more inclusive list can be found at [www.faa.gov/uas/nprm](http://www.faa.gov/uas/nprm), through the link “overview of the Small UAS NPRM”, however the highlights include:

- Maximum altitude of 500 feet above ground level
- Maximum airspeed of 100 mph
- Unmanned aircraft must weigh less than 55 pounds
- Daylight – only operations
- Pilots (operators) will be required to pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center and be vetted by the Transportation Security Administration
- Unmanned aircraft must remain within Visual Line-of-Sight (VLOS) of the operator or visual observer

Development of Beyond Visual Line of sight (BVLOS) – enabling technology and permissive yet safe regulation is what Stewart Ballie of Unmanned Systems Canada called the “Holy Grail” of the sUAS future. By future, he was referring to the wide ranging global estimates for the potential size of the UAS market residing somewhere between one and ninety-plus billion dollars. Such a large variation in dollar amount is tempting to toss aside, however the low side really isn’t anything to scoff at. The financial potential as of now rides on government regulations combine with technology’s ability to provide consumers what they want within the law.

**Beyond October 2015**

During the UAS workshop, Lewis Graham, President and Chief Technical Officer of GeoCue joked, “…we’ve been flying these things (UAS) for three years now but haven’t really figured out how to make money with them.” With the insights from the development of federal regulations and impending market data analysis, the solution to determining who wants to buy a UAS will be answered. Who knew the Real Estate industry would be second on the list? Last year that market didn’t even hit the radar. The more obvious industries to benefit from the current and potential abilities of drones have inspired the addition of UAS focused degrees nationwide. The programs range from a 24 hour entry-level technical certification course to a Master of Science in Unmanned and Autonomous Systems Engineering, and UAS minors have been added to Aeronautics, Mine and Civil Engineering degrees. Upon closer inspection of education programs somewhat outside of the obvious correlating industries, Unmanned Aerial System understanding and use has also been integrated into GIS, Land Surveying, Law Enforcement, Agriculture and Fire Science curriculum, just to name a few. The “Poster Session” held at the symposium was a testament to the incorporation of RAS technology and its application to the survey, mapping and remote sensing fields. A review of the projects and studies on display can be found at uasreno.org under “Poster Session”.

Though package deliveries from amazon may be farther down the road in this venture, adding UAS services to the company tool box of many industries is no longer Beyond Line-of-Sight.

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**New Members**

The Pacific Southwest Region ASPRS Membership Committee offers a Big Welcome to the following NEW MEMBERS!

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<tr>
<td>Brandon Jones</td>
<td>Christian Haselwimmer</td>
<td>Arnault Dumont</td>
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<td>Hsiao-Chien Shih*</td>
<td>Jolene Hoffman</td>
<td>Christopher L. Fendell*</td>
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<td>Eric P. Phan</td>
<td>Carl Kubitz</td>
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<td>Ryan Revells*</td>
<td>Ana Rivera*</td>
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**July 2015**

None

* = Student Member
Pacific Southwest Region Council - 2016
By Lorraine Amenda

Each year the members of the Pacific Southwest Region needs to elect new members for the Region Council. The positions open in 2016 are Vice President (commitment covers 3 years, one year as VP, one year as President, and one year as Past President) and three (3) Regional Director Positions (each is for a two-year term).

If you are interested in service the Pacific Southwest Region of ASPRS in either of these positions, please email the Chair of the Nominating Committee, Past President Bill Zeman (billzeman@gcsmapping.com).

Upcoming Technical Sessions

The 2015 slate of officers are looking for assistance in planning future sessions as well as locations in which to hold sessions.

If you would like to suggest a topic for a future meeting, can provide a location in which to hold a session, or offer yourself as a speaker, please contact pswasprs@gmail.com.

GIS Day 2015

GIS Day will once again be observed throughout the Pacific Southwest Region of ASPRS.

If you are involved in the planning of GIS Day activities and would like to have the Pacific Southwest Region partner with you, please send information on your organization and plans for GIS Day to pswASPRS@gmail.com.

We will be happy to promote your event to the Region’s membership. In addition, the Region has typically provided assistance with refreshments at events held throughout the Region in exchange for making ASPRS membership materials available.

Pacific Southwest Region Scholarships

The Pacific Southwest Region ASPRS will once again be offering scholarships to our student members. Applications will be available on the Region’s website – PSWASPRS.org – no later than October 30, 2015. Completed applications must be submitted by December 15, 2015.

Three Scholarships in the amount of $1,000 will be awarded. One each to students in the following fields:

Photogrammetry
Remote Sensing
GIS

Application Requirements:

Completed Application Form
College Transcripts (Unofficial Copy is Acceptable)
One Page Essay on “How Can ASPRS, Nationally or Regionally, Provide More Value to Students”
Looking for an event to attend later this week? Check out these two events.

**Hawai‘i Geographic Information Coordinating Council (HIGICC) – Hawai‘i Planning and GIS Conference**

*October 14-16, Hawai‘i Convention Center*

The annual Hawai‘i planning and GIS conference, put together by the Hawai‘i State Office of Planning (OP), the Hawaii Congress of Planning Officials (HCPO), and the Hawai‘i Geographic Information Coordinating Council (HIGICC), will be held October 14-16th at the Hawai‘i Convention Center. This year’s conference, themed "Island Futures", will include sessions on the economic, social and environmental issues facing the Hawaiian Islands today and the ways in which the planning and GIS communities can assist in ensuring a positive future for the islands. Case studies, current management methods and the newest GIS technologies will be featured. The combined conference format will include joint and individual plenary sessions, mobile workshops, breakout sessions and specific educational seminars.

The Pacific Southwest Region is one of the sponsors this year – please stop by our booth on the exhibit floor and meet Regional Director Ross Winans.

**Phenology Research and Observation of Southwest Ecosystems (PROSE)**

The 8th annual Phenology Research and Observation of Southwest Ecosystems (PROSE) Symposium will be held on Friday, October 16, 2015 on the University of Arizona campus in Tucson, Arizona. The symposium brings together researchers, students and citizen scientists to share the latest findings in the relationships between weather, climate, and important biological stages such as the flowering of plants and migration of animals in the Southwest. This year’s symposium will also serve as the kick-off for a week of activities comprising the 3rd annual Phenology Days Celebration, which will culminate in a family-friendly festival at the Mission Gardens of Tucson on October 24th. The symposium is co-sponsored by USA National Phenology Network (USA-NPN), the PACSW Region American Society for Photogrammetry and Remote Sensing (ASPRS), the UA Institute of Environment (IE), the UA School of Renewable Natural Resources (SNRE) and the U.S. Geological Survey (USGS). Jake Weltzin, the Director of the USA-NPN will provide the keynote address "The USA National Phenology Network: A national framework for phenological research, applications and education.” A competition will be held for the best student poster presentations. Register online at: https://www.usanpn.org/prose2015 (Contacts Cynthia SA Wallace, cwallace@usgs.gov; Jessica Walker, jjwalker@usgs.gov)
Identify an Historic Aerial Photo Contest

If you can identify the area shown in the photo to the right, send an email to pswasprs@gmail.com and be entered into a drawing for a Pacific Southwest Region ASPRS USB Drive. Eligible entries must be received by October 31, 2015.

All who correctly identify the scene shown in the historic photo will be identified, along with the winner, in our next edition of the newsletter.

Hint: Let’s try something a little further away this time.

Can you identify the area shown in this photo from the Towill, Inc., archives? Email your answer to pswasprs@gmail.com to qualify for the prize drawing.

I guess this one was a little too hard to identify. No correct answers.

Russian River at Pacific Ocean, California
November 26, 1956 – This photo is where the Russian River meets the Pacific Ocean.
PSW News

Your Pacific Southwest Region Council

The officers for the Pacific Southwest Region are working hard to provide you with quality technical presentations near to home.

In the last few years we’ve offered technical sessions in San Diego, Fresno, Reno, and Davis. We are currently planning sessions for 2015. If you have suggestions for locations and topics for a session near where you live, please contact one of our officers or the region email at pswasprs@gmail.com.

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We welcome any suggestions that would allow us to better serve ASPRS membership in Arizona, California, Nevada, Hawaiʻi, and the Pacific Islands.

Can you suggest a better name for our Newsletter? Send your suggestions to pswasprs@gmail.com. If your suggestion is adopted, you’ll receive a PSW Region USB Drive as a prize!