



Steve Best  
with the  
SWC Drone

## WATER COMMISSION INTEGRATES DRONE TECHNOLOGY TO FURTHER AGENCY CAPABILITIES

During the fall and early winter of 2016, the Planning and Education Division of the State Water Commission (SWC) initiated a Drone or Small Unmanned Aircraft System (sUAS) Program within the agency. The program was developed to assist all of the divisions at the SWC with various tasks that could be improved upon or made more efficient through the use of drone technology. In addition, the SWC has offered its drone sUAS program service to other agencies that have expressed a need for the technology.

Throughout the winter and early spring of 2016/2017, Steve Best, from the SWC's Planning and Education Division, researched a number of different makes and models of sUAS, examining each model's benefits and drawbacks. Eventually,

the decision was made to choose the Yuneec Typhoon H as the system that would best suit the needs of the SWC. The Typhoon H is a hexacopter, meaning that it has six propellers. While most drones on the consumer market have four propellers, a drone with six propellers has the ability to remain in the air even when a propeller becomes damaged by shutting down the opposing motor and flying back to the take-off point and landing.

The Typhoon H has an approximate 15-20 minutes of flight time, and has the capability of shooting both 4K video and excellent quality still photos. This machine is a consumer-level drone, but is capable of completing the work that the agency is currently requiring it to.



In order to fly drones for commercial or governmental use, the pilot must be licensed by the FAA under 14CFR Part 107; Small Unmanned Aircraft Systems. Part 107 is basically a mini “ground school” that just falls short of the same training private pilots would complete in order to fulfill their classroom training.

Currently, Steve Best serves as the SWC’s lone drone program pilot. Steve completed his training through many hours of self-guided study, as well as an online training program called RemotePilot 101. After taking and passing numerous practice tests, Steve traveled to Minot to take the official proctored Part 107 test, and passed with a 95%. His license is valid for two years, so he will be re-taking the test in February 2019 for renewal.

Having never flown a sUAS before, Steve first took the SWC’s new drone on a few “shakedown” flights in April 2017 to learn the controls and capabilities of the Typhoon H. Understanding the drone’s capabilities is essential to producing the quality of video and imagery that is needed.

There is a tremendous amount of planning involved prior to putting the sUAS in the sky. In order to understand where the drone is allowed to fly, the pilot must evaluate airspace maps, obtain permissions if needed, check to see if weather is going to cooperate, inspect equipment, charge batteries, and so on.

Depending on the area and flight objective, the Typhoon H has the capability of programming certain flights prior to arriving on site. This allows for smooth flights and excellent camera work. Other flights can only be flown free-hand.

The Drone Program has been a very popular tool for the SWC. All divisions within the agency have requested the use of the drone for various projects, and it has been used for collecting imagery around the state. The focus of drone flights have included low-head dams, reservoirs, the Little Missouri River, Lake Sakakawea, Southwest Water Authority

Drone photo of the Badlands



construction projects, sovereign lands, cost-share inspections, and extensively for projects on the Missouri River.

The drone program has also helped other state agencies improve their services. In spring 2018, The SWC worked in collaboration with the ND Game and Fish Department on a public outreach project to raise awareness of the drowning hazards associated with low-head dams. Drone footage was run on ND Game and Fish’s ND Outdoors news segment statewide, and was also produced as a ND Outdoors Weekly Webcast. On another occasion, the SWC teamed up with the ND Department of Corrections and Rehabilitation (DOCR) and collected imagery of sovereign lands on DOCR property along the Missouri River near the Missouri River Correctional Center in south Bismarck.

Throughout the last year, Steve has reached out and offered guidance to other state agencies when they have had questions about starting drone programs of their own. He has conducted drone demonstrations and given various presentations regarding drone capabilities and FAA rules.

For an example of the imagery that the SWC has collected with its done, please check out the Water Commission’s YouTube page!