UASD Summary – BIA Choctaw Fire Agency Prescribed Burning

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Sam Cox – Remote Sensing Specialist, RP, UASD(T)

A 3-person UAS module was ordered by the BIA Choctaw Fire Agency to assist in resource mapping and prescribed burning operations on Choctaw Trust Lands in central Mississippi in November 2025. I filled the role of UASD (T) with expectations for mapping and data production. The operational temp was slower than a wildfire, with far fewer resources in play. A total of about a dozen people were involved in the operations on a daily basis. There was no GISS involved in this operation, so obtaining relevant GIS layers for planning was a bit more challenging. The smaller group facilitated better communication among all crew members, and this was an advantage for frequent informal discussions on UAS technology and operations. Virtually every crew member spent some time with the UAS module observing and learning. During this 2-week assignment, the following products and workflows were deemed useful by the FMO.

1. Burn unit boundary creation for UAS ops. The UASD obtained shp files of planned prescribed burn units and created KML files to be used in flight planning in Auterion Mission Control, Skydio Flight Deck, and DA Flight.
2. Burn unit GeoPDF creation for UAS ops. The UASD utilized boundary shp files, aerial hazard layers, and topographic/orthoimagery basemaps to create GeoPDF flight maps suitable for loading in DA Flight and Skydio Flight Deck. Because the GeoPDF maps are customized to show the layers needed for safe UAS operations, they have an advantage over straight basemaps available in the flight apps.
3. Preloading GIS layers and maps into flight controllers. The UASD used a USB drive to load the KML layers and GeoPDFs onto controllers for the Skydio X10, Astro, and Alta X.
4. Pre-burn resource mapping. The UASD created flight plans in Auterion Mission Control for Astro collection of stereo imagery to create digital surface models and orthomosaics of burns units. This wasn't feasible for some of the very large burn units, particularly those with very thick timber and tight LRZ areas that prevented long lines of sight; however, for several of the ~200-ac burn units, these mapping operations went well. The UASD placed Aeropoint ground control points prior to the mapping flights, retrieved them afterward, assisted with mapping flight operations, and downloaded all ground control, flight log and image data after the flights. The UASD used Metashape to produce digital surface models and orthomosaics of the burn units. These are intended to act as long-term monitoring baselines, as well as enhanced basemaps for field operation maps for future operations.
5. Aerial Ignition. The UASD communicated with the remote pilots on starting video, stopping video before landing, ideal video techniques, and downloaded all log data from

the controller plus image data from the camera SD card after every flight. The UASD ensured that camera media was sufficient for each flight and that camera lenses were clean before each flight. The UASD also assisted as needed in battery charging and swapping.

6. Full Motion Video (FMV). The UASD utilized Alta X flight logs and video to create full motion videos from every video collected during aerial ignition flights. These were helpful in showing the FMO where hotspots were present, and to confirm that no fire had moved beyond the planned prescribed burn perimeter.
7. Flight logs for visualization in Google Earth and Acrobat. The UASD converted flight logs into feature classes populated into GeoPDF maps showing the drop location of every ignition sphere within the burn unit. This can be used to confirm successful deployment of the resource, as well as correlate burn patterns with the ignition sphere deployment pattern for future operations adjustments. The feature classes were converted to KML files to viewing in a 3-dimensional framework within Google Earth.
8. Video compilation. The UASD utilized video clips from phones and UAS to create a compilation of the UAS operations at the FMO's request to be used to promote the value of UAS modules on prescribed burns and resource mapping in the BIA.
9. Metadata. The UASD authored FGDC-compliant metadata for all GIS products and ensured compliant naming convention was applied to all files.
10. Data discussions and packaging. The UASD communicated with the FMO and other members of the crew throughout the 2-week period on all aspects of the data collection and processing, including a session in the conference room showing data on the big screen and describing how various data sources can be utilized to improve operational efficiency. The UASD packaged all data onto a thumb drive and handed this off to the FMO at demobilization.