



Ohio Department of Natural Resources
Division of Oil and Gas Resources Management
Orphan Well Program Survey Section



DRONE WORKSHOP DATA MANAGEMENT/SPATIAL DATA DISCUSSION



GEOMETRICS

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NATURAL RESOURCES

RECAP OF COMMON UAV SENSORS



RIEGL

- GIMBAL MOUNTED CAMERA
- THERMAL
- LiDAR UNIT
- MAGNETOMETER
- ETC.....



ODNR

OLD SCHOOL PHOTOGRAMMETRY AND GROUND CONTROL



ODOT

- STARTED IN WW1 ERA
- MANNED AIRCRAFT
- FILM THEN TO DIGITAL IN 2000'S
- 60% FORWARD LAP 30% SIDE LAP
- CAMERA "NADIR" AKA VERTICAL
- GCP'S FOR SOLVING FOR CAMERA POSITION/ATTITUDE

WHAT ARE GROUND CONTROL POINTS NOW AND THEN



PROPELLER AERO

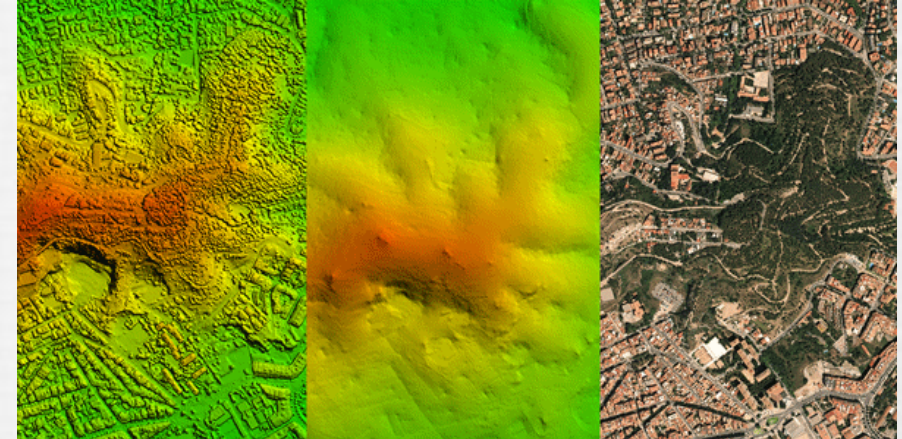
- AT IT'S BASIC LEVEL ARE POINTS OF KNOWN LOCATION THAT ARE USED TO CONTROL "ITEMS" OF UNKNOWN LOCATION
- CONNECT YOU TO A KNOWN DATUM
 - COMMON SPATIAL LANGUAGE
- NOW ARE COLLECTED USING GNSS MEASUREMENTS
 - UNCORRECTED OR CODE (3-9') VS CORRECTED (SUB FOOT – SUB INCH)
- OPTIONS FOR NON-SURVEYORS?
 - "SMART" TARGETS
 - LEARN POST PROCESSING

MODERN UAS PHOTGRAMMETRY PRODUCTS



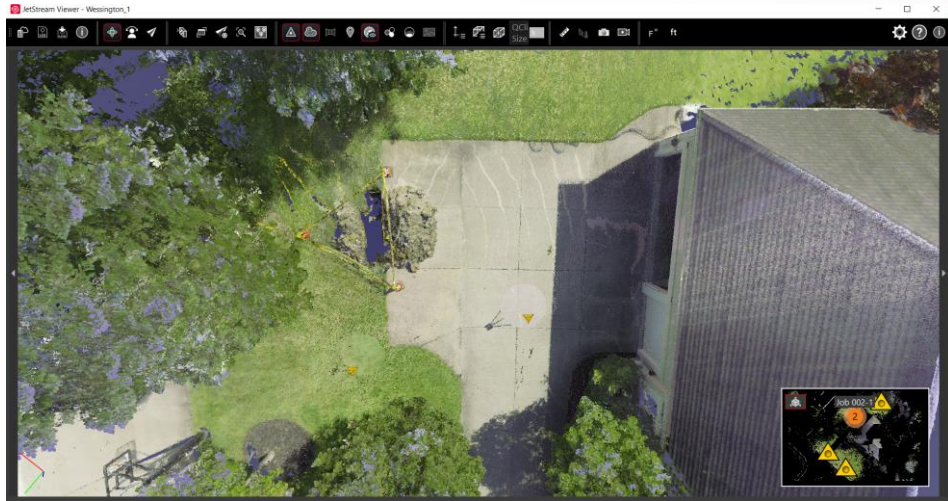
SANBORN

- ORTHOPHOTO
- DSM
- POINT CLOUD



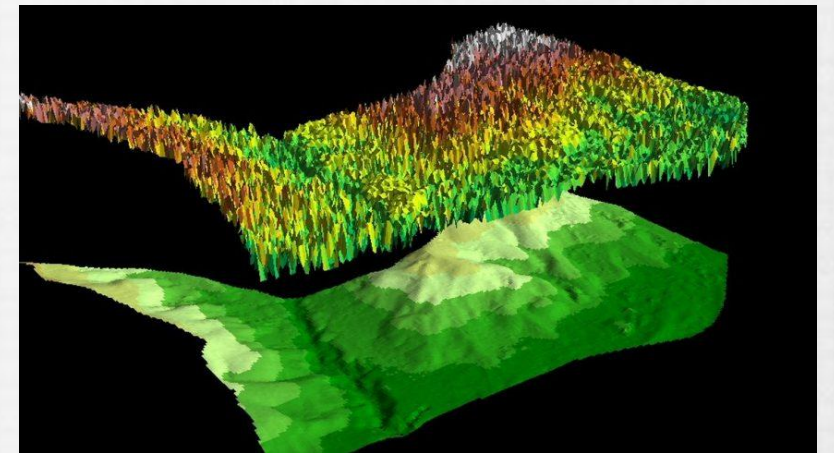
YOURDRONEBUSINESS

MODERN UAS LiDAR PRODUCTS



- DSM
- POINT CLOUD

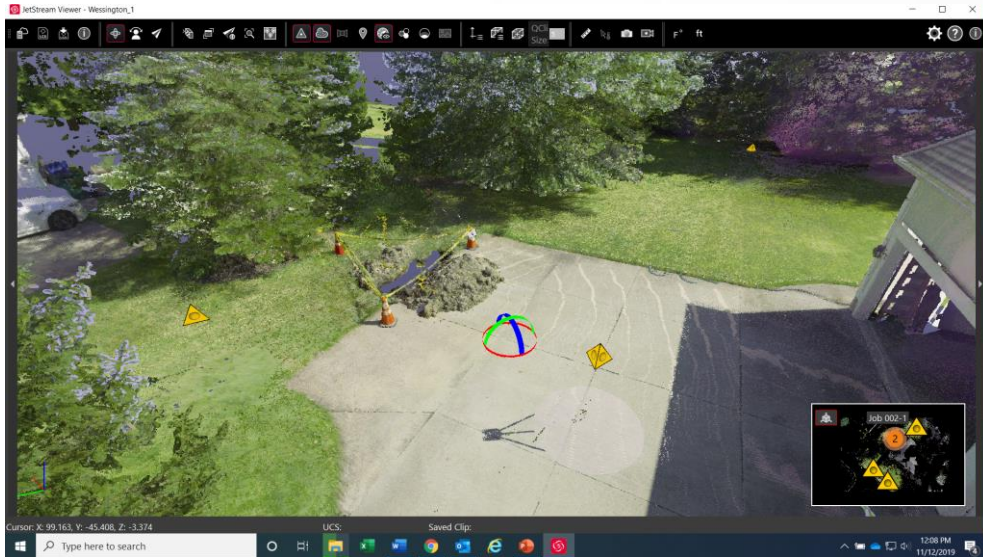
ODNR



FORESTTECH

SOFTWARE

- PROCESSING SOFTWARE
 - CLOUD VS SERVER BASED VS LOCAL TO MACHINE
 - PIX4D - PHOTOGRAMMETRY
 - GEOQUE – LiDAR, SERVER BASED
 - TRIMBLE/LIECA – PHOTO/LiDAR
 - DATA DECIMATION
 - CONNECTION SPEEDS
 - LAPTOP/CELLULAR
 - OFFICE HARDWIRED



UAS SENSOR FILE SIZE

1 KB	1024 B	B = byte
1 MB	1024 KB	KB = Kilobyte
1 GB	1024 MB	MB = Megabyte
1 TB	1024 GB	GB = Gigabyte
1 PB	1024 TB	TB = Terabyte
1 EB	1024 PB	PB = Petabyte
1 ZB	1024 EB	EB = Exabyte
1 YB	1024 ZB	ZB = Zettabyte
		YB = Yottabyte

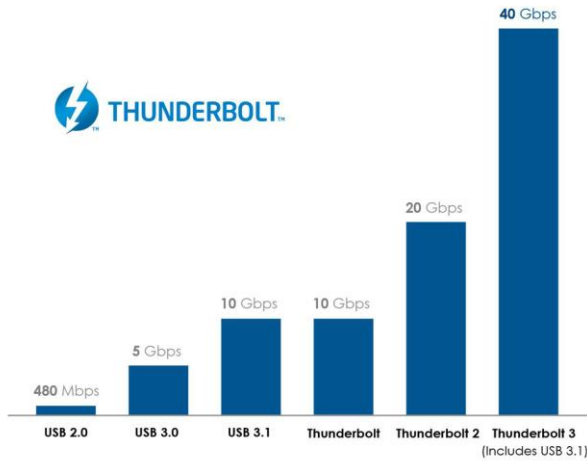
www.infodentips.com

- LiDAR FILES
 - ODOT BUDGETS 2TB FOR 40 MAPPING PROJECTS OF RAW DATA
 - DEPENDS ON A LOT OF VARIABLES
- CAMERA/VIDEO
 - 4K VIDEO 64 GIGS FOR 1HR 20MIN
 - PHOTOGRAMMETRY 20 ACRE JOB APROXIMATLY 15 GIGS
- MAGNETOMETER
 - 1000HZ EXPECT 100+MB FOR 50 ACRE SURVEY



STORAGE

- TYPES OF STORAGE
 - SHORT TERM – MICRO SD/FLASH/SSD
 - THUNDERBOLT, USB 3.0
 - LONG TERM – SERVER
 - LOCAL SERVER
 - OFFSITE DATA MANAGEMENT
 - FULL CLOUD
- COST
 - MY COST IS \$250 PER MONTH FOR 10 GIG
 - OTHER EXAMPLES?



VELOCITY MICRO.COM



BH PHOTO VIDEO.COM

CHALLENGES FOR GOVERNMENT



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- IT DATA STORAGE RULES
 - RECORDS RETENTION POLICY
 - STATE MANDATED SDMS
 - CLOUD STORAGE NOT ALLOWED?
- PROFESSIONAL ETHICS
 - RAW DATA VS FINISHED PRODUCTS
 - RECORDS RETENTION

QUESTIONS FOR/FROM GROUP

- GCP'S?
- DOES ANYONE USE CLOUD STORAGE?
- STATE DOCUMENT MANAGEMENT SYSTEMS? SDMS
- DOES YOUR RECORDS RETENTION POLICY COVER UAS "DATA"?

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