ArcGIS Full Motion Video 1.3 Add-In

Esri Raster Development Team

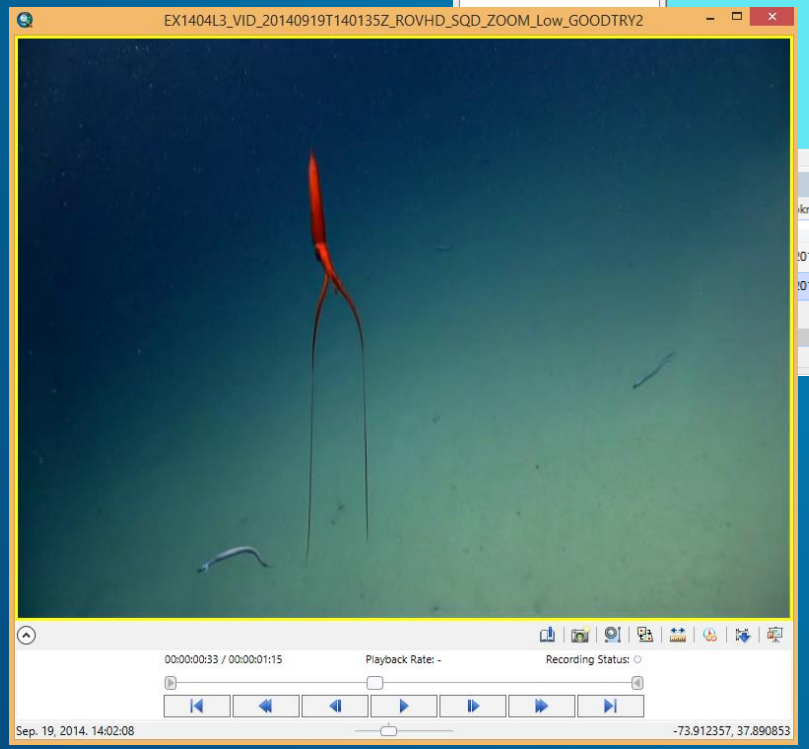
Jeff Liedtke

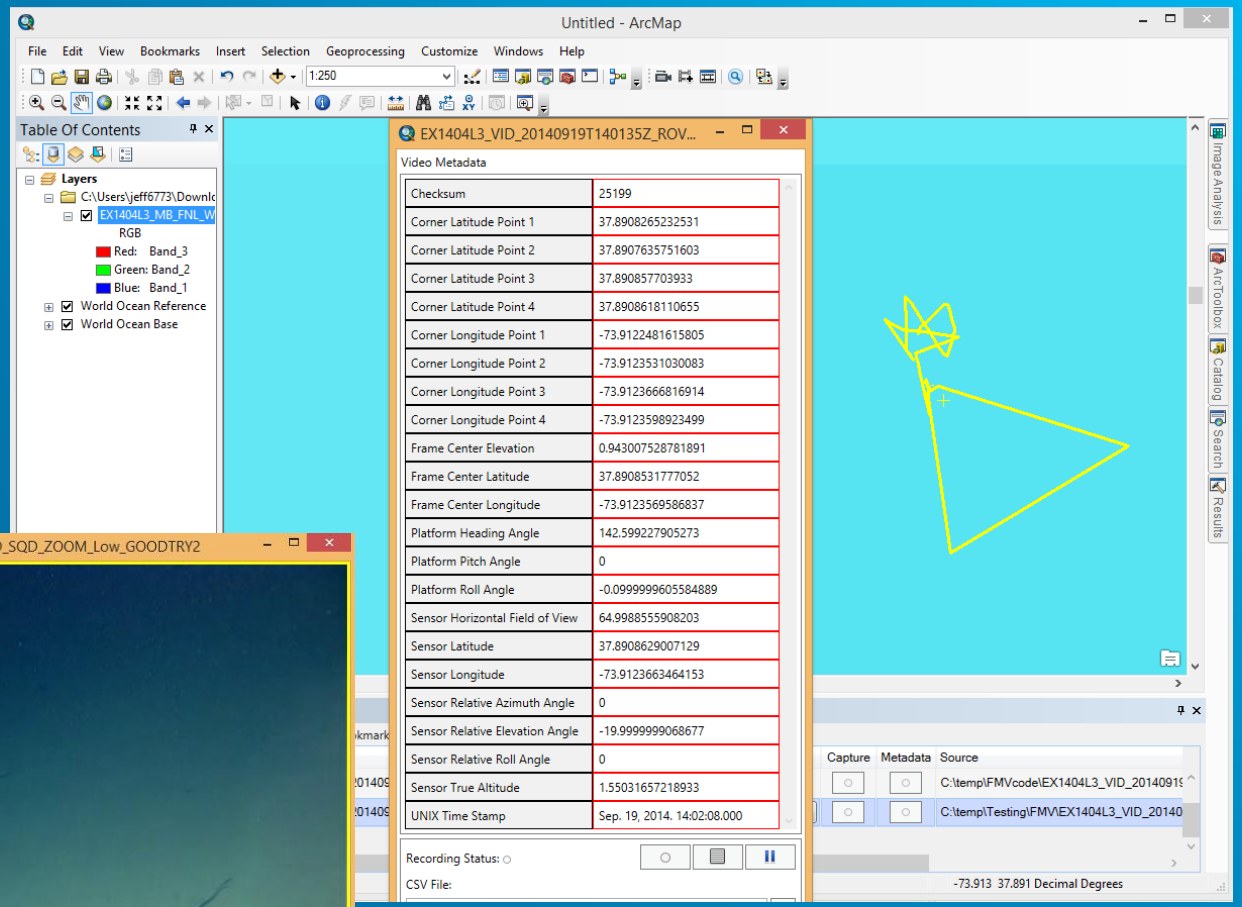
Alex Muleh

ArcGIS Full Motion Video Overview

Agenda

- What is Full Motion Video (FMV)?
- Who uses it?
- Esri FMV product features
- FMV Landing page
- Demos – data courtesy of NCEI

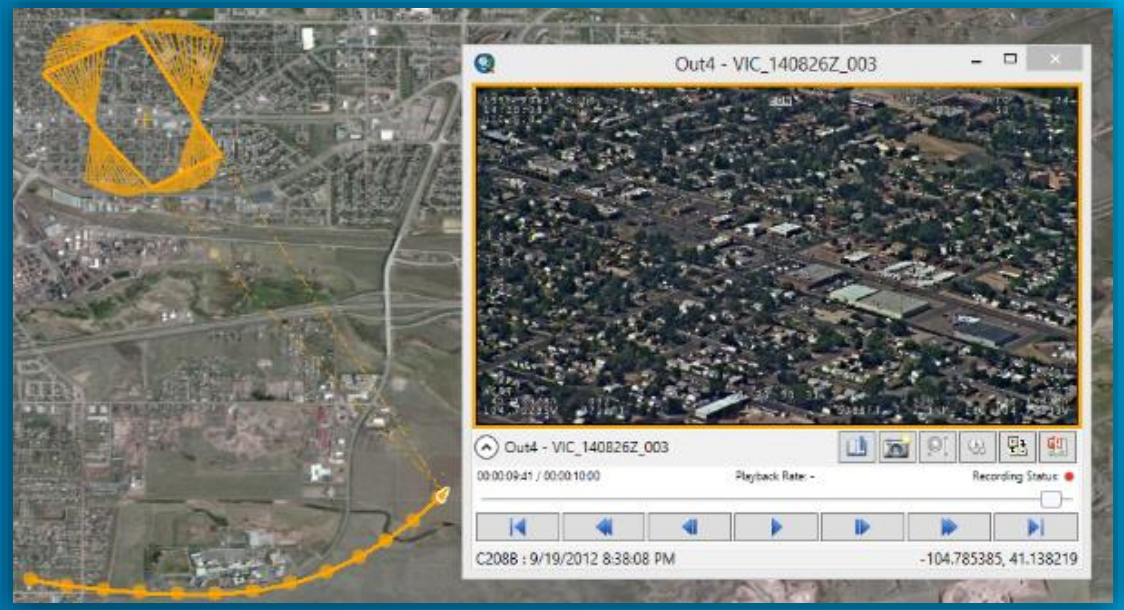


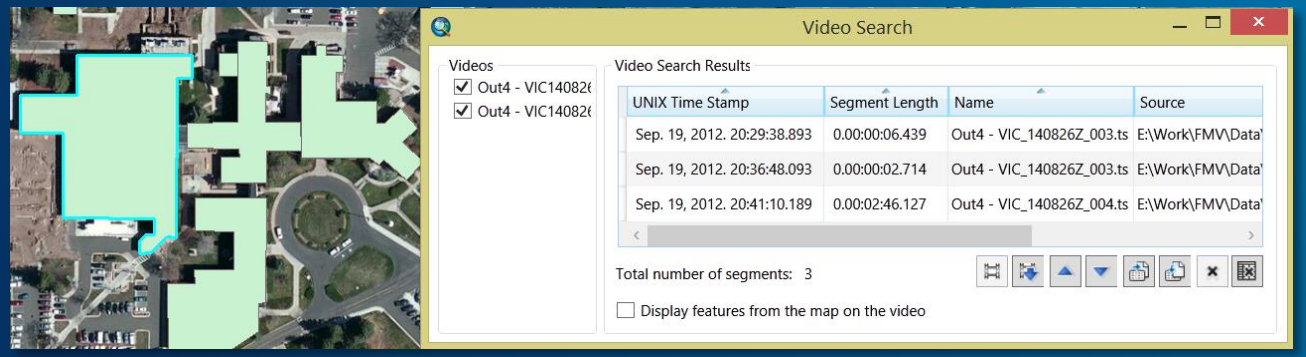


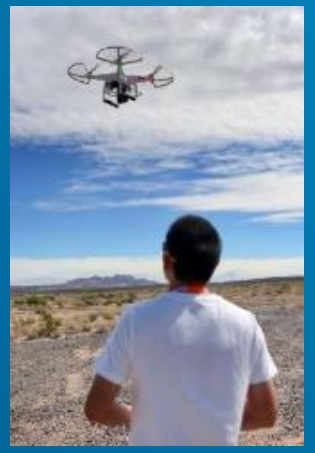
ArcGIS Full Motion Video

Advantages

- Map your videos
- Quickly find, view and analyze video data
- Easily share videos and information derived from videos
- Enable smarter decisions – faster!







Full Motion Video is often abbreviated "FMV"

Who Uses FMV

Situation Awareness

- Anyone who needs to monitor remote or dangerous locations
- Public Safety and Emergency Management
- Defense
- Oil Companies
- Local and Federal Governments
- Border Patrol
- Utilities

ArcGIS Full Motion Video

Where does FMV data come from?

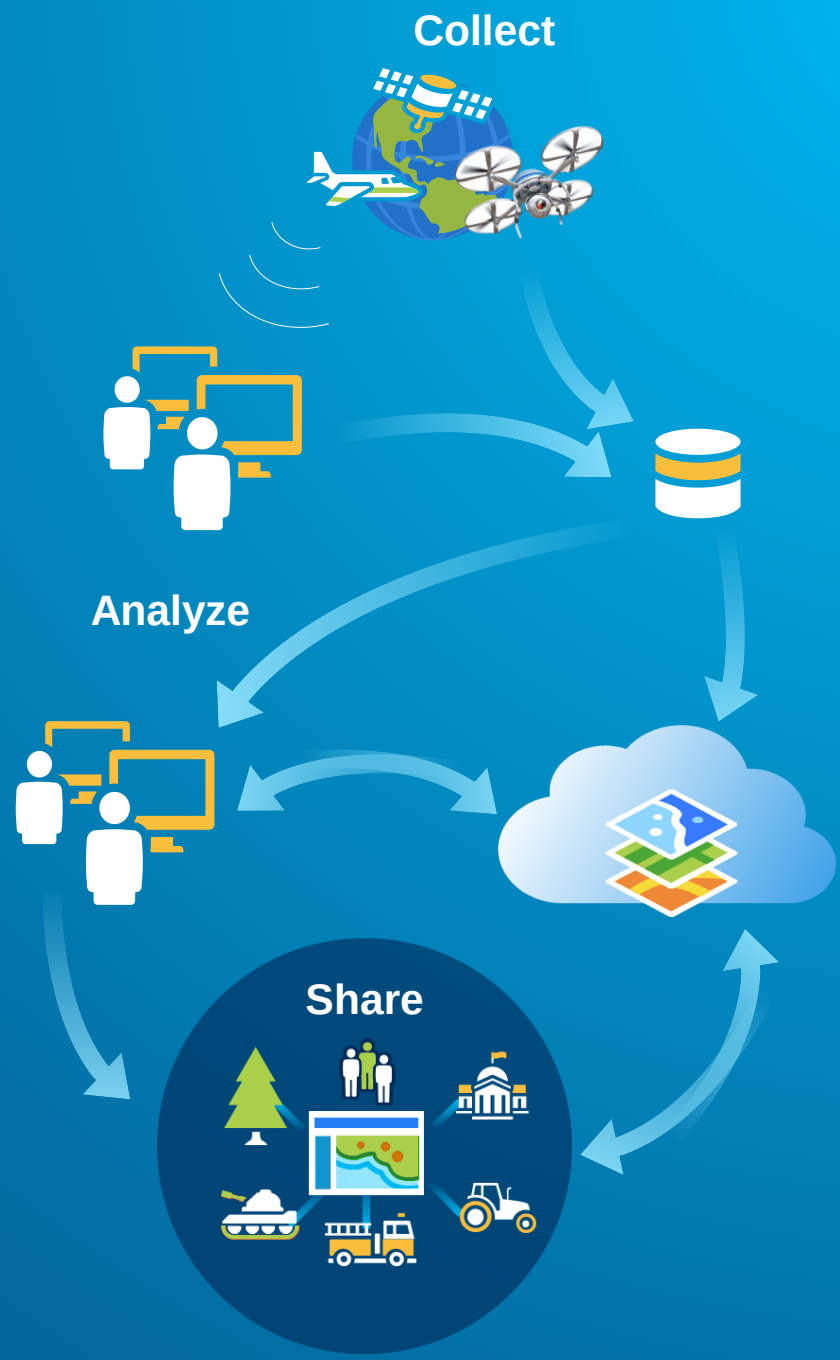
- Unmanned Aerial Vehicles (UAV's; UAS's, RPV's, drones)
  - Need to add USV – Unmanned Submersible Vehicles !!!
- Fixed Wing and Helicopter
- Orbital sensors (overhead sensors)
- Vehicle mounted cameras
- Hand-held mobile devices and cameras
- Stationary (persistent surveillance)

ArcGIS Full Motion Video

Support Operational Workflows

Find, Analyze and Disseminate video information

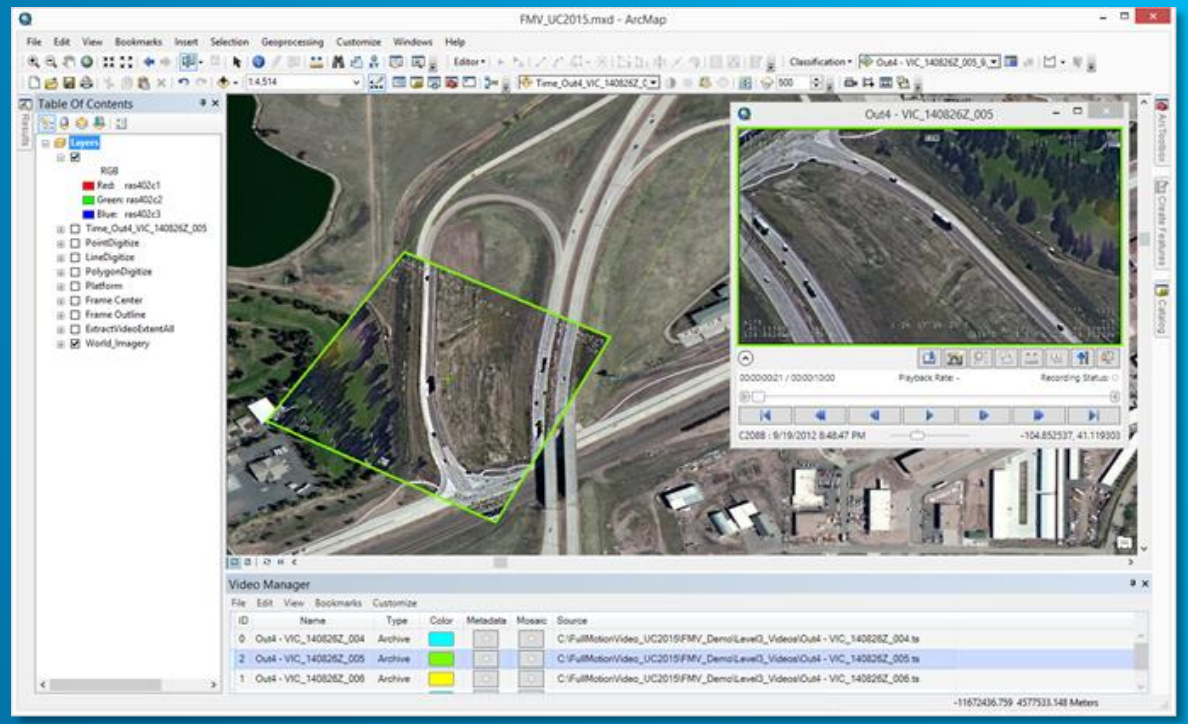
- Direct connect to live video streams
- Search archived video based on location, features of interest and timeframe
- Analyze video information, measure, mark, annotate, Bookmark critical locations and events, create and edit feature data on the video and map seamlessly, create mosaics
- Generate Powerpoint reports with one click, export video clips, create mosaics and share as a service

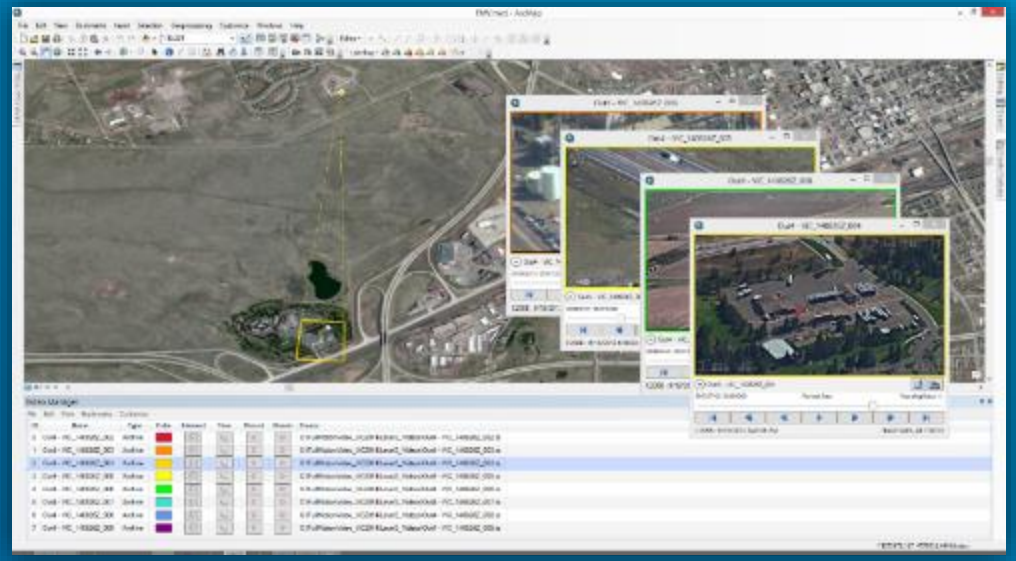


ArcGIS FMV Features

The Video Player

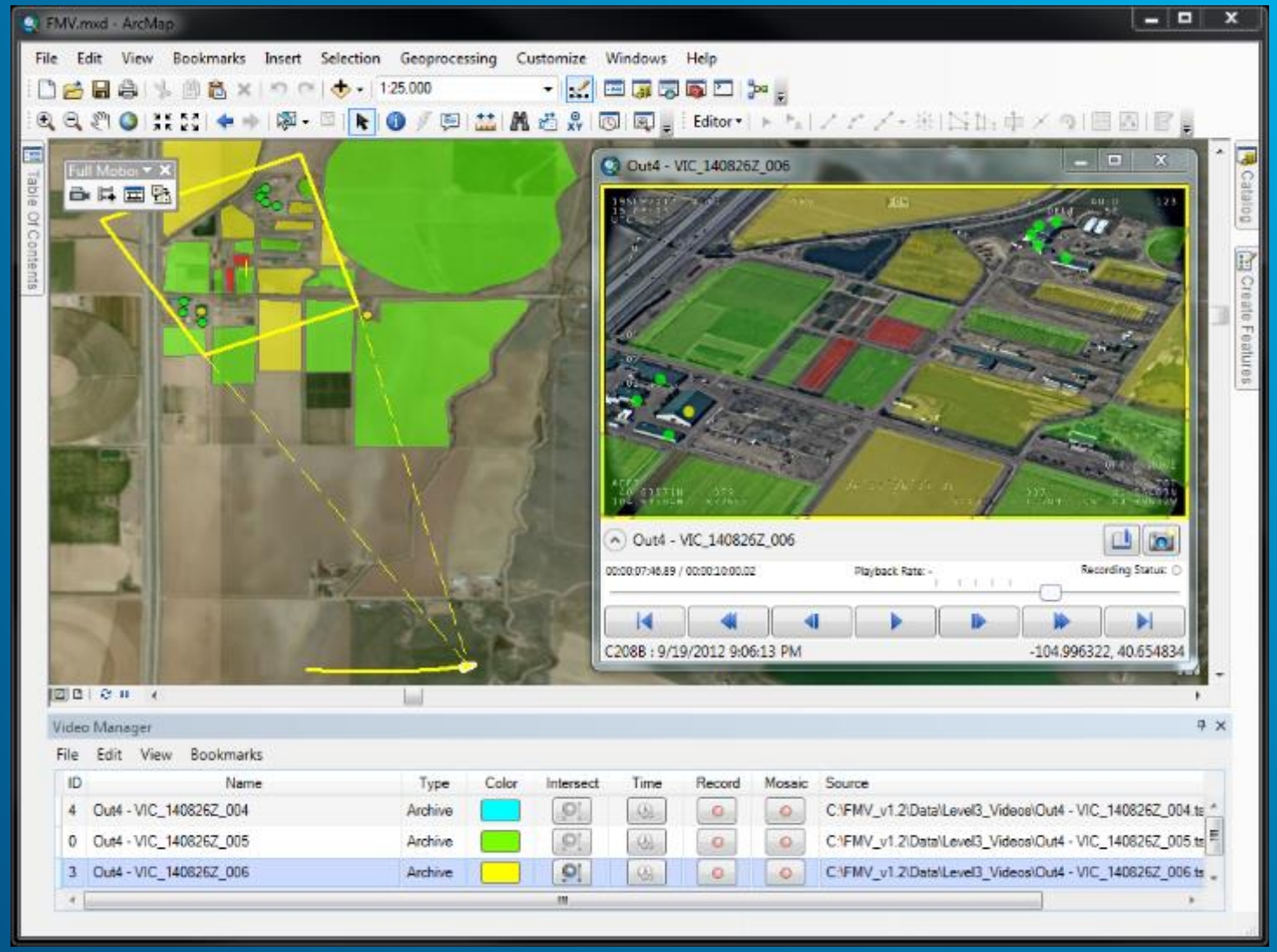
- Pan and Zoom for live streams and archived videos
- Easily export new video clips
- Live stream Recording
- Slow & fast motion playback
- Overlay video frames on the map display
- Use DEM/DTED data to increase video-to-map and map-to-video accuracy
- Display metadata in real time





Analyze and disseminate videos and information

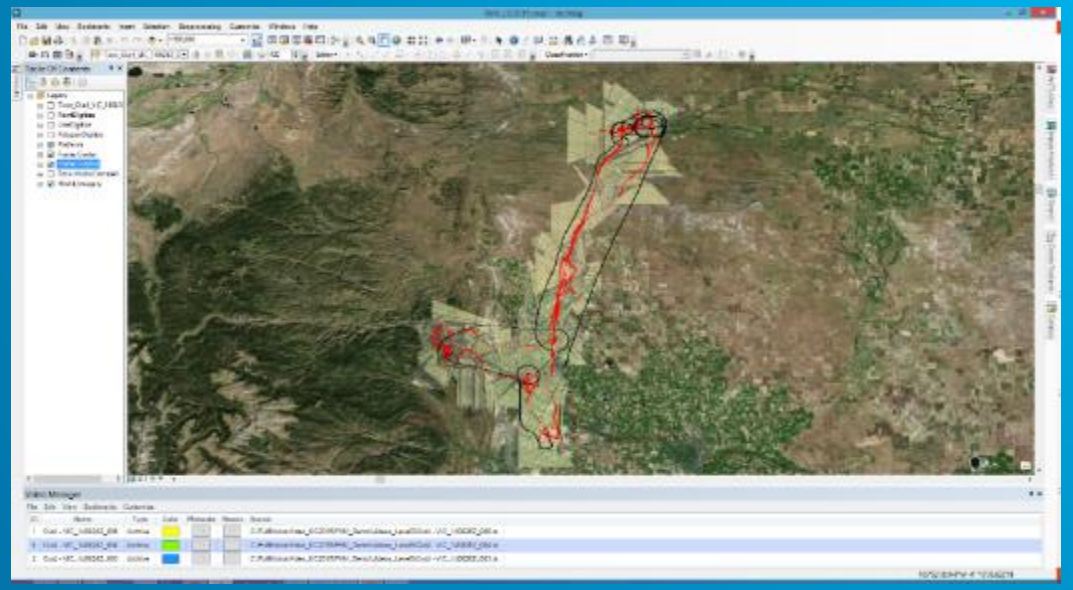
- FMV is integrated with ArcMap
- Georeference video frames to your maps
- Collect and overlay features seamlessly in both the video display and the ArcGIS Desktop display
- Bookmark critical locations and events
- Measure, mark, annotate video
- Create mosaics
- Create and export video clips
- Create Powerpoint reports with one click

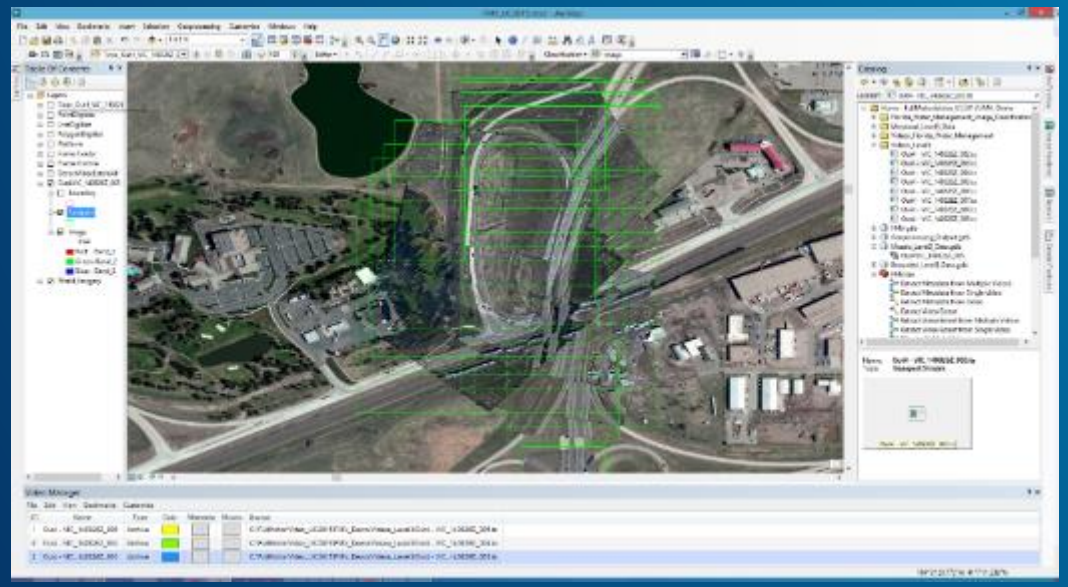


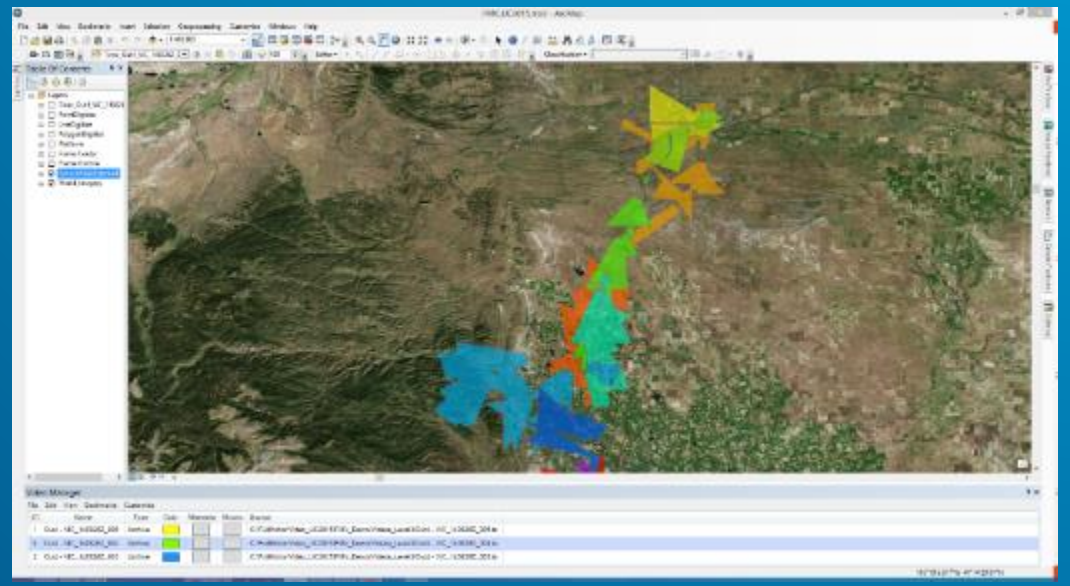
ArcGIS Full Motion Video

FMV Geoprocessing Tools

- Extract Metadata from Video
- Extract Video Extent
- Mosaic Video
- Video Multiplexer
  - Combine Video and metadata into one video stream to create MISB-compliant data







Steps to get NCEI data into FMV

1. Combined 2 .raw file containing metadata into csv files
   - .raw file 1 contained platform latitude, longitude, and Unix time stamp
   - .raw file 2 contained Platform heading, pitch, roll and depth
2. Did a join in ArcMap using the Unix Time Stamp to create 1 CSV containing all metadata
   - A few records did not join, these were not significant and were omitted
3. Used the FMV Video Multiplexer tool to combine the video stream and metadata

Need

1. Horizontal Field of View
2. Sensor Relative Azimuth
3. Sensor Relative Elevation
4. Sensor Relative Roll

UnixTimeStamp	Platform Heading	Platform Pitch	Platform Roll	Sensor Longitude	Sensor Latitude	Sensor Altitude	Horizontal FOV	Sensor Relative Azimuth	Sensor Relative Elevation	Sensor Relative Roll
1411141140000000	153	1.4	0.9	-73.9129819	37.89008	-1093.8	100	0	0	0
1411141140000000	153.1	1.4	0.9	-73.9129819	37.89008	-1093.8	100	0	0	0
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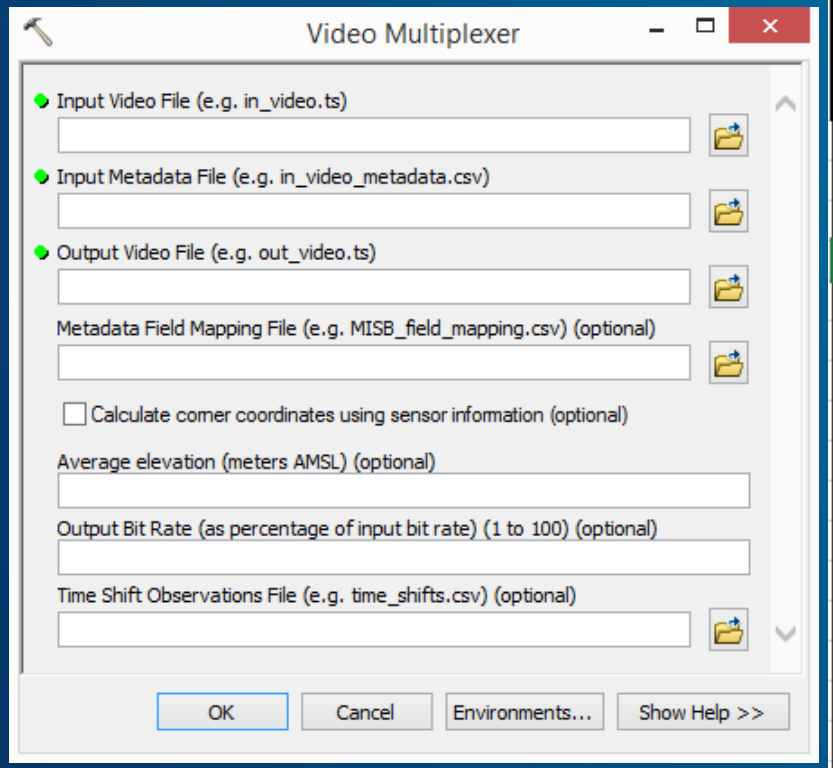

UnixTimeStamp	Platform Heading	Platform Pitch	Platform Roll	Sensor Longitude	Sensor Latitude	Sensor Altitude	Horizontal FOV	Sensor Relative Azimuth	Sensor Relative Elevation	Sensor Relative Roll
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1411141140000000	153.1	1.4	0.9	-73.9129819	37.89008	-1093.8	100	0	0	0
1411141140000000	153.1	1.5	0.9	-73.9129819	37.89008	-1093.8	100	0	0	0
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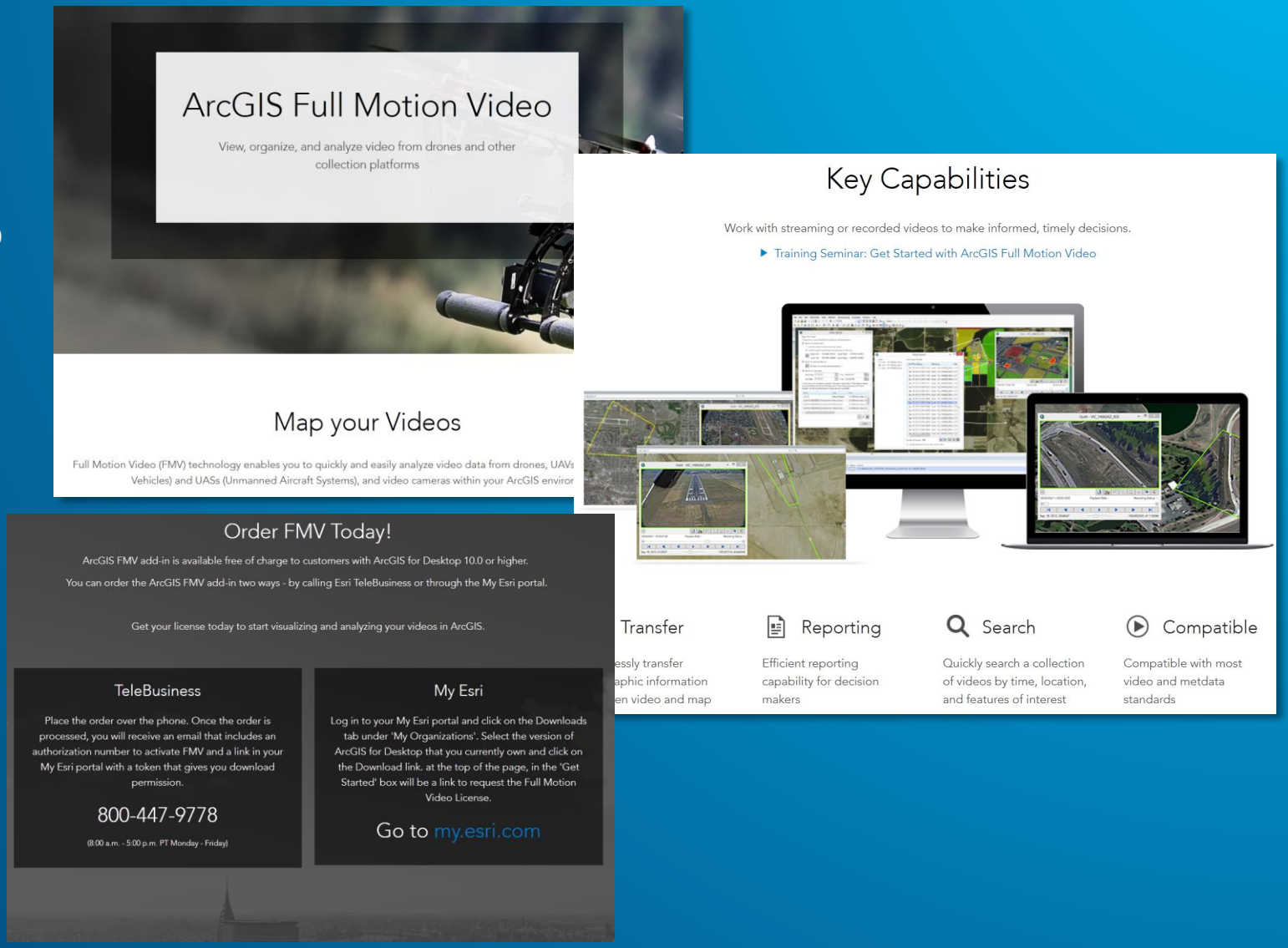
Enabling Capabilities for NOAA/NCEI video viewing, processing and management

- **Video Multiplexer**
  - Enables metadata and videos to be converted to MISB-compliant video data
  - Display video frame on the map and bathymetry data
- **Video Search**
  - Allows NOAA-NCEI video archives to be searched according to location and time
- **Mosaicking of video frames into a Mosaic Dataset**

Full Motion Video Landing Page

- http://www.esri.com/fmv
- Esri webpage containing links to customer-facing FMV resources:
  - Order FREE FMV 1.3 Add-In
  - GeoNet correspondence and info
  - User's Manual
  - Blogs
  - Tutorials and data
  - FAQ and other customer service information
  - Presentations

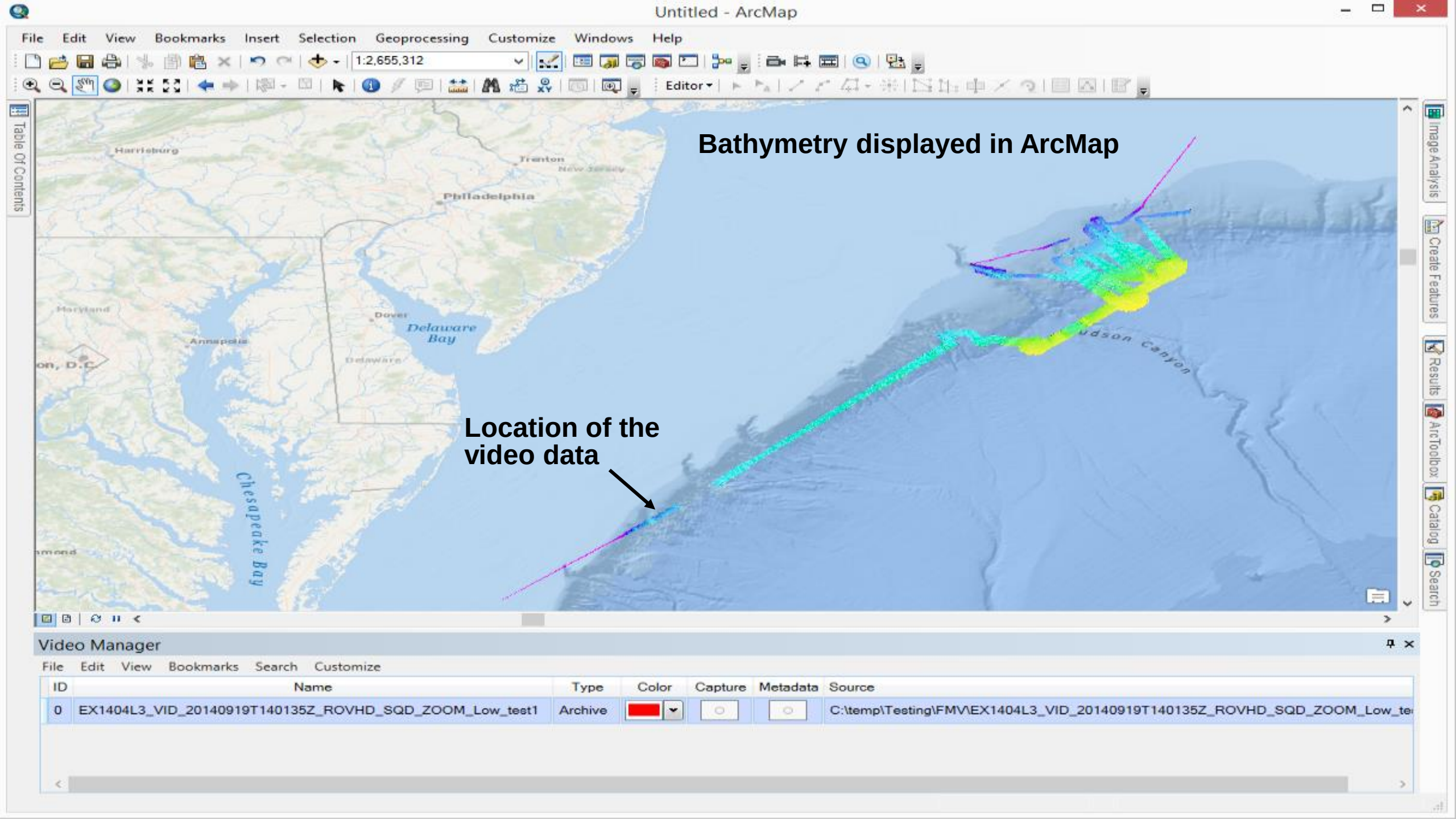


Contact Information: jliedtke@esri.com

For information about the MISB Standard:

Go to http://www.gwg.nga.mil/misb/zip_pubs.html and download the zip file titled 'MISP-2016.1'. Unzip the file and look for a folder called

'MISP-2016.1CompositeDocuments'. Open the folder and look for a pdf called 'ST0601.9.pdf'. This pdf contains a reference to all of the MISB fields supported by the FMV tool set. It also includes descriptions of the parameters and useful diagrams.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Results
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Search
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Delaware Bay
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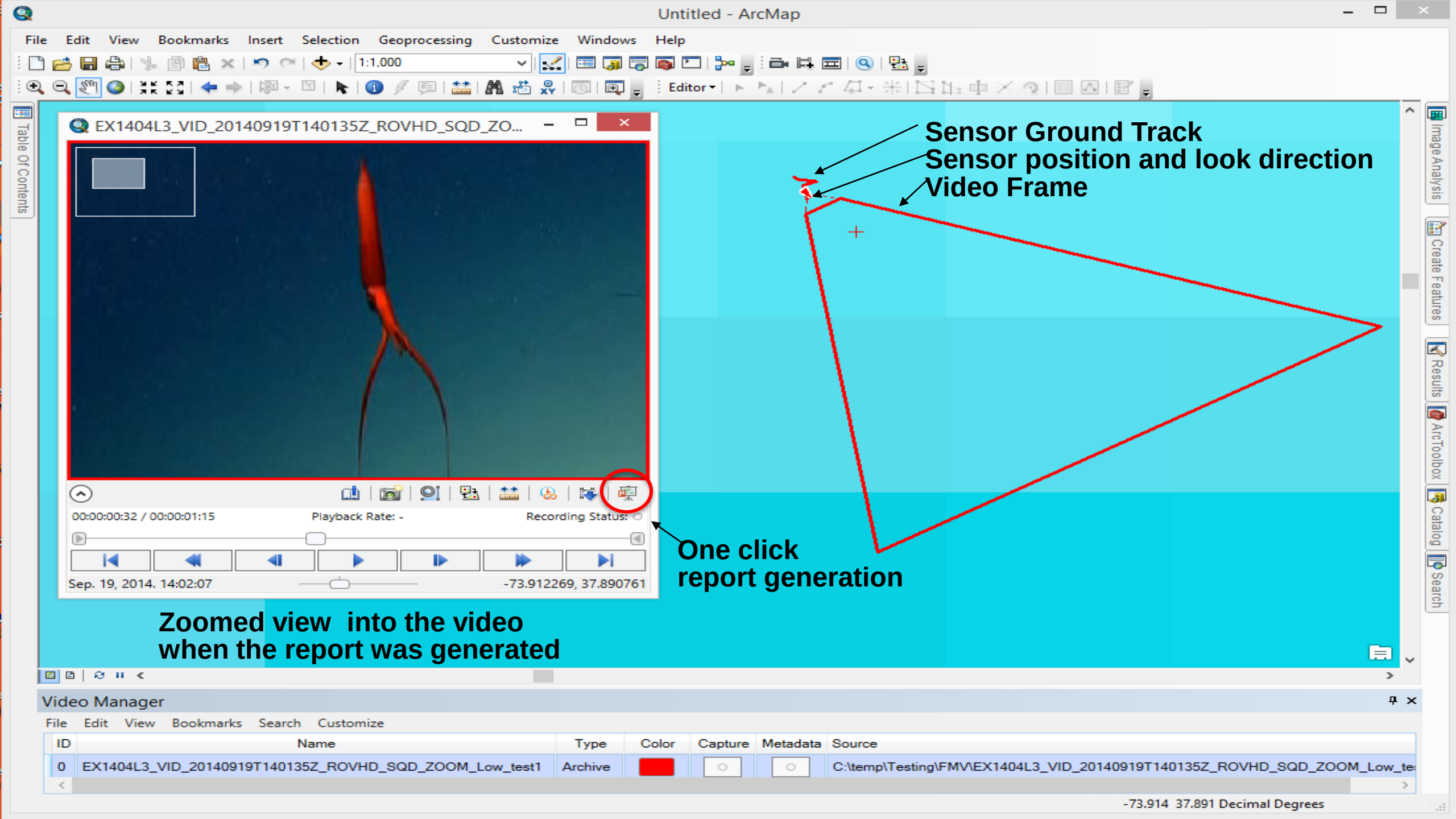
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Sensor Ground Track
Sensor position and look direction
Video Frame
One click
report generation
Zoomed view into the video
when the report was generated
Image Analysis
Create Features
Results
ArcToolbox
Catalog
Search
Video Manager
File Edit View Bookmarks Search Customize
ID Name Type Color Capture Metadata Source
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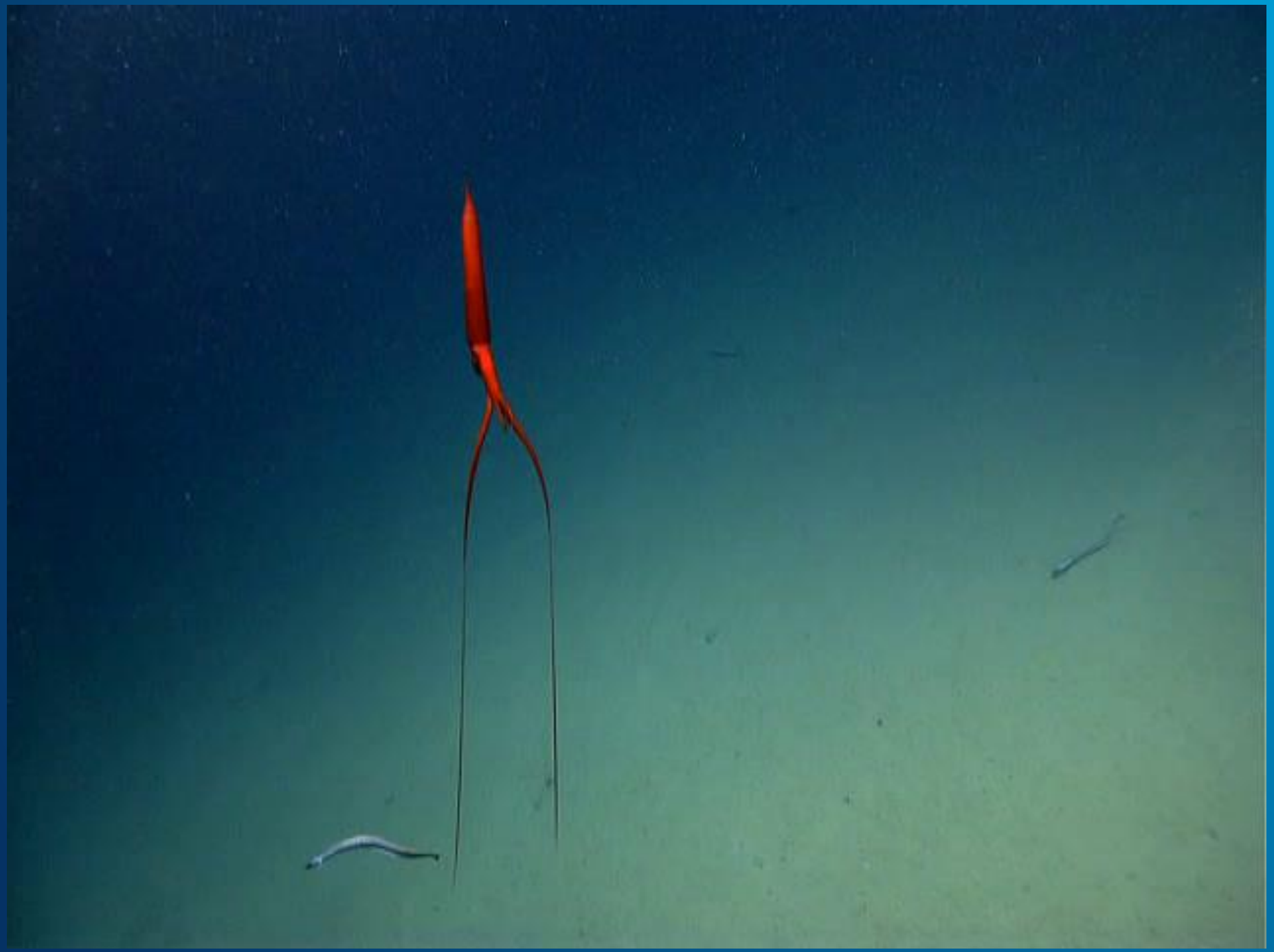
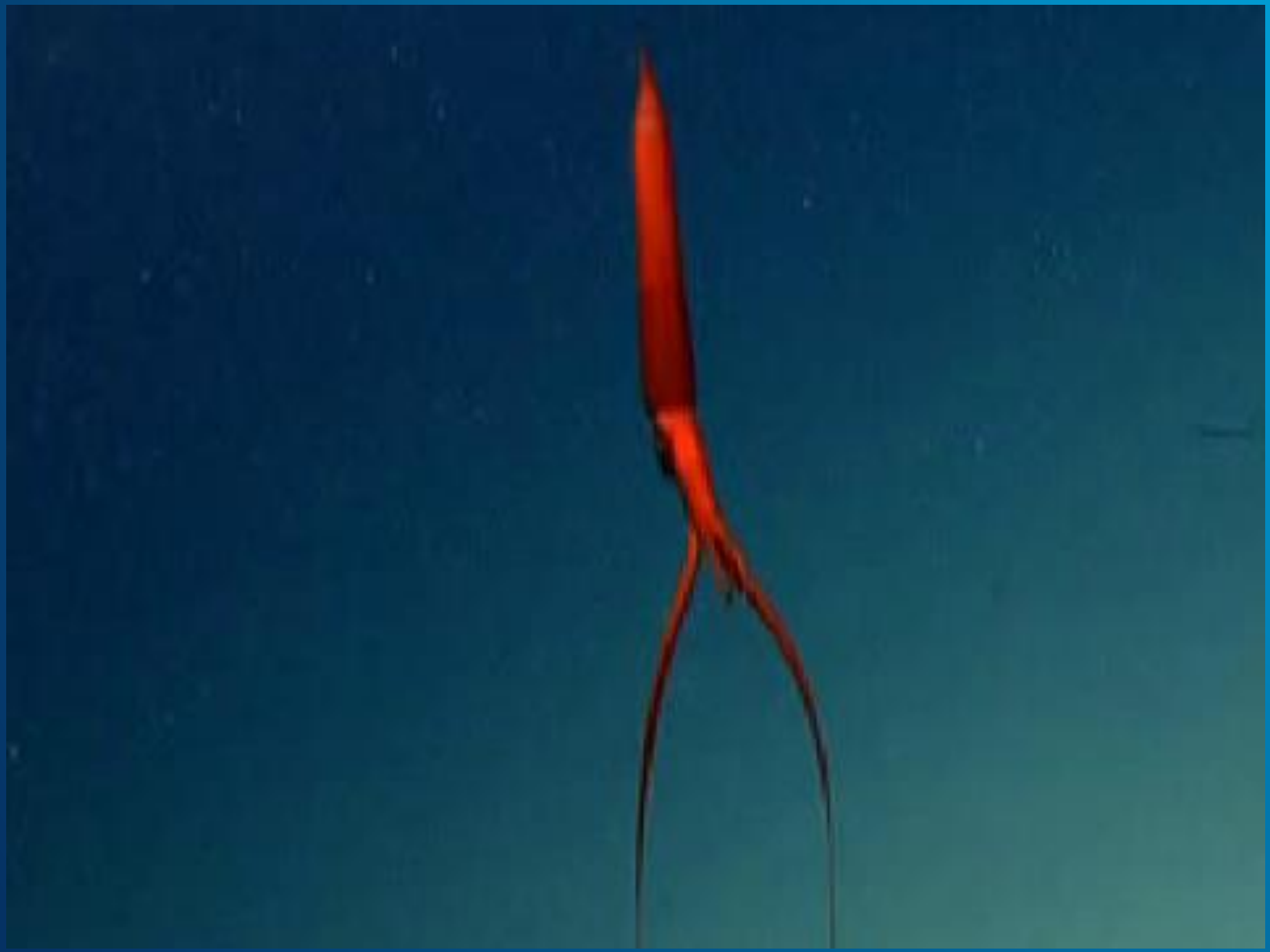
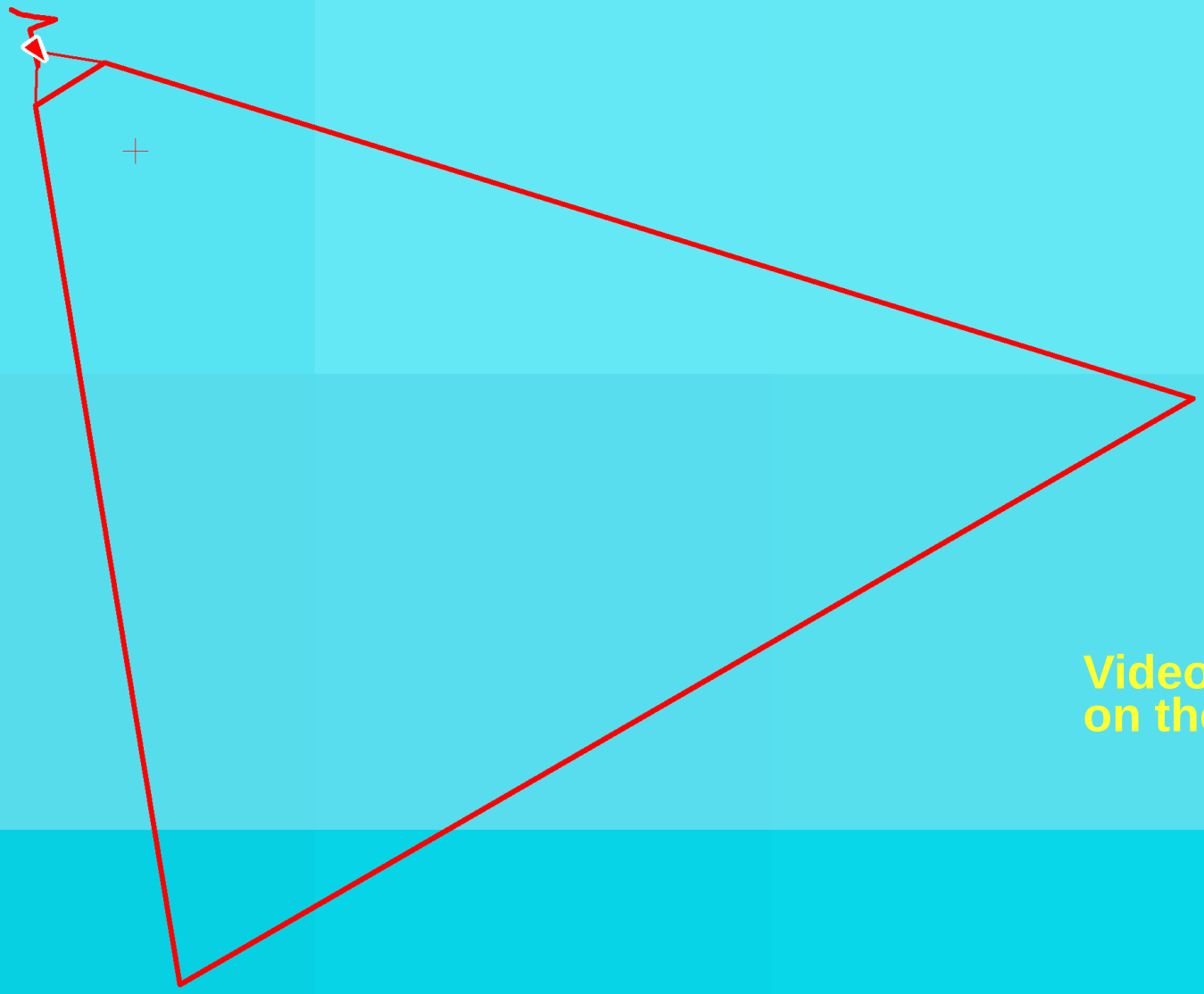
ArcGIS Full Motion Video
Automatic Powerpoint Report



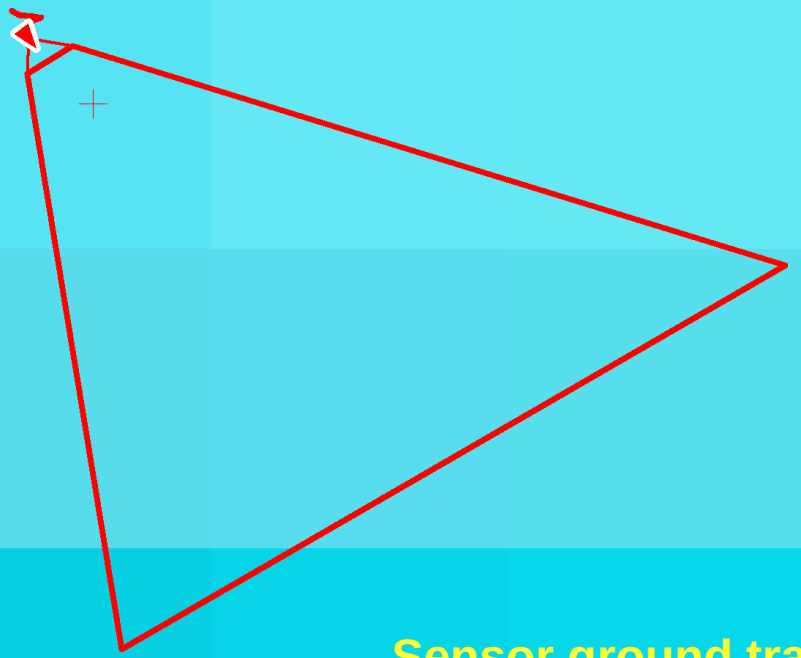
Video Frame



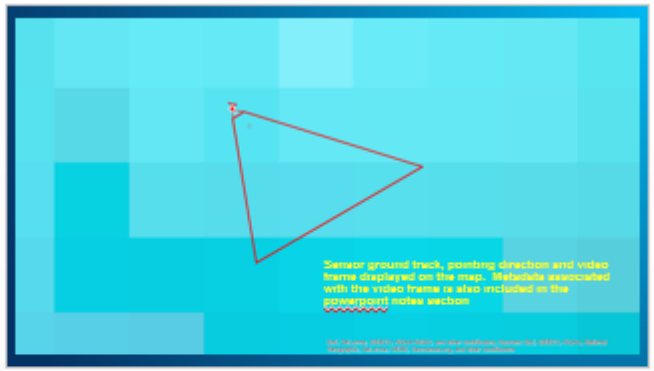
Zoomed view into the video when the report was generated



Video Frame displayed on the map



Sensor ground track, pointing direction and video frame displayed on the map. Metadata associated with the video frame is also included in the powerpoint notes section



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Military Grid Reference System (MGRS): 18SWG9563494263

Frame Center:
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Military Grid Reference System (MGRS): 18SWG9563494263

Frame Corners:
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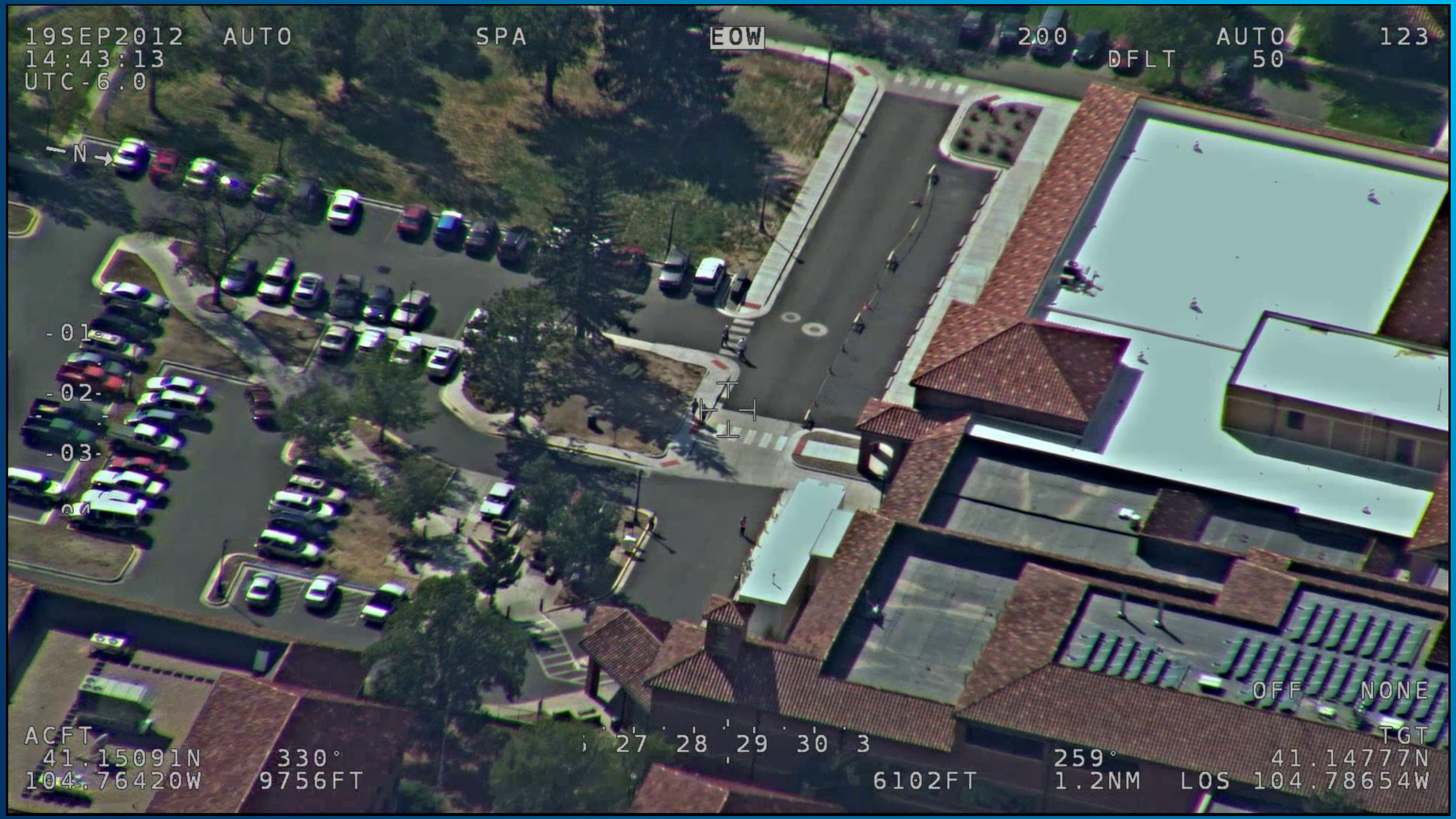
Metadata associated with the video frame is also included in the report in the Powerpoint Notes section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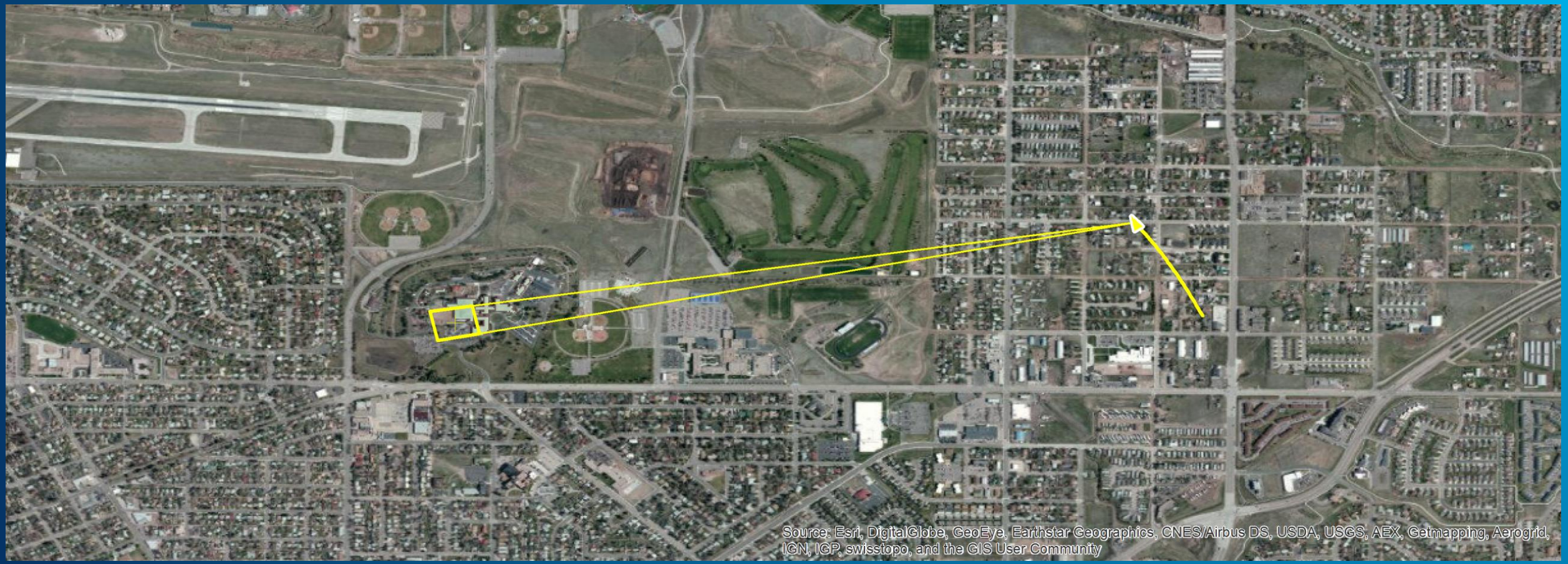
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community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