2022 Briefing to RRT5

Drones in EGLE

By

Art Ostaszewski
EGLE - Drone Program Coordinator
Ostaszewskia@Michigan.gov
517-936-7991
2022 Drones in EGLE

1. What is “Drone Technology” in the EGLE Drone Program
2. EGLE Drone Policy, Privacy, Security
3. EGLE Drone Considerations - Models, Apps, Postprocessing, Deliverables
4. Lessons Learned - Crashes- Incidents, Curveballs, Blue or Not to Blue
5. The EGLE Drone Program - 5 years of Metrics: 2017 thru 2021
6. Questions
The Use of Drones to Improve Planning and Assessment

What is “Drone Technology”
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1. The Drone

The **vehicle** that gets in the air
The Use of Drones to Improve Planning and Assessment

What is “Drone Technology”

1. The Drone
   The vehicle that gets in the air, in the water, or on the ground
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   The *vehicle* that gets in the air, in the water, or on the ground

A drone does not “Take” your sample

You don’t “Sample” with a Drone
The Use of Drones to Improve Planning and Assessment

What is “Drone Technology”

1. The Drone
   The *vehicle* that gets in the air, in the water, or on the ground

2. The Sensor/Attachment
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   Photo/Video, Thermal Imagery, Lidar Sampling/Monitoring
   $$$ Can Cost More than Drone
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   *Software* that takes the Sensor output
   Making meaningful Deliverables
   Requires High-End *Hardware* (Processor/RAM/Graphics)
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NEW 4. UAS Enterprise Management
Subscription based-cloud management of the entire fleet/postprocessing/environment
NEVER GIVE UP

Never stop trying to exceed your limits. We need the entertainment.
Drone Policy
The Use of Drones to Improve Planning and Assessment

Drone Policy - *needed whether you fly or not*
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Addressing Drone Use in your organization, educating staff

Preventing potential bad press, ill public perception, liability (physical and legal).
DEPARTMENT POLICY AND PROCEDURE

02-006 - Use of Small Unmanned Aircraft Systems

Original Effective Date: 8/20/2016
Last Reviewed Date: MM/DD/YYYY
Distribution: All EGLE Employees

ISSUE
The Department of Environment, Great Lakes, and Energy (EGLE) owns and operates a number of unmanned aircraft systems (UAS), commonly referred to as drones. This policy and procedure is to establish requirements for the safe operation and legal use of UAS in the EGLE.

AUTHORITY
Title 14 of the Code of Federal Regulations (CFR), Part 107, Small Unmanned Aircraft Systems
Unmanned Aircraft Systems, 2016 PA 436, as amended, Michigan Compiled Laws (MCL) 259.301 - 259.331

DEFINITIONS
Aerial reconnaissance technology drone technical and program support team (ART Drone TAPS Team) - The ART Drone TAPS Team is a group of representatives from each EGLE division that advise and coordinate the use of UAS technology within EGLE.
Air traffic control (ATC) - The ground-based personnel and equipment concerned with monitoring and controlling air traffic within a particular area.
Division UAS representative - Responsible for division UAS operations, division pilots, and coordination with the EGLE UAS coordinator. This person is appointed by the division director.
Drone - Generic term for unmanned aerial vehicle or system.
EGLE remote pilot in command (EGLE RPIC) - An EGLE employee designation that indicates all requirements have been met, allowing the person to fly a UAS for EGLE. This person holds a remote pilot certificate with a UAS rating and has the final authority and responsibility for the operation and safety of an UAS operation conducted under FAA Part 107.
EGLE UAS coordinator - Works with division UAS representatives to coordinate UAS use, training, and reporting at the department level. The EGLE UAS coordinator tracks UAS inventory, coordinates
Drone Policy - EGLE

Procedures - Mission Planning, Mgmt Approval

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Training / Demonstration of Proficiency
Drone Policy - EGLE

Procedures - Mission Planning, Mgmt Approval

Training / Demonstration of Proficiency

Privacy - Incidental Imagery
Drone Policy - EGLE

Procedures - Mission Planning, Mgmt Approval

Training / Demonstration of Proficiency

Privacy - Incidental Imagery

Security - Best Practices
Drone Policy - EGLE

Procedures - Mission Planning, Mgmt Approval

Training / Demonstration of Proficiency

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Security - Best Practices

NEW United States Presidential Memorandum
Drone Policy - EGLE

Procedures - Mission Planning, Mgmt Approval

Training / Demonstration of Proficiency

Privacy - Incidental Imagery

Security - Best Practices

NEW United States Presidential Memorandum

Incident Reporting - Minor, Major, Catastrophic
PERSEVERANCE

The Courage to Ignore the Obvious Wisdom of Turning Back.
Drone Training in EGLE
The Use of Drones to Improve Planning and Assessment

Drone Training in EGLE

WannaBees - No FAA Cert, No Experience 🐝

ChickenHawks - Part 107 Certification
   Trainer drone ($35) Proficiency - Evaluation
   Entry level field drone - DJI Spark, Mavic ($500)
   Mission Planning Development - Airspace, LAANC, Weather, Checklists
   Evaluation/Demonstration with Entry Level Drone

EGLE Remote Pilot in Command -
   Entry Level Drone >> Camera Drone >> Specialized Drone
   Spark, Air P4P-Anafi M210-M300-M600
The Use of Drones to Improve Planning and Assessment

Privacy
The Use of Drones to Improve Planning and Assessment

Privacy

Google Maps satellite images cover 98 percent of the world's population.

It has photographed 10 million miles of Street View imagery.

Mariella Moon, @mariella_moon 12.14.19 in Internet

14 Comments 430 Shares
Privacy

In Drone use, there has emerged a statutory difference between
Privacy

In Drone use, there has emerged a statutory difference between Flying,
Privacy

In Drone use, there has emerged a statutory difference between Flying, Flying and “taking a picture”
Privacy

In Drone use, there has emerged a statutory difference between Flying, Flying and “taking a picture”, and “the intent of the drone picture”.

![Drone images]
***** Act 436 of 2016 THIS NEW ACT IS EFFECTIVE APRIL 4, 2017 *****
UNMANNED AIRCRAFT SYSTEMS ACT
Act 436 of 2016

AN ACT to provide for the operation and regulation of unmanned aircraft systems in this state; to create
the unmanned aircraft systems task force; to provide for the powers and duties of state and local governmental
officers and entities; and to prohibit conduct related to the operation of unmanned aircraft systems and
prescribe penalties.

Privacy

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259.322.new THIS NEW SECTION IS EFFECTIVE APRIL 4, 2017 ***
259.322.new Operation of unmanned aircraft system; harassment, violation of order, or invasion of privacy prohibited; definition; individual registered as sex offender.

Sec. 22. (1) A person shall not knowingly and intentionally operate an unmanned aircraft system to subject an individual to harassment. As used in this subsection, “harassment” means that term as defined in section 411h or 411i of the Michigan penal code, 1931 PA 328, MCL 750.411h and 750.411i.

(2) A person shall not knowingly and intentionally operate an unmanned aircraft system within a distance that, if the person were to do so personally rather than through remote operation of an unmanned aircraft, would be a violation of a restraining order or other judicial order.

(3) A person shall not knowingly and intentionally operate an unmanned aircraft system to violate section 539j of the Michigan penal code, 1931 PA 328, MCL 750.539j, or to otherwise capture photographs, video, or audio recordings of an individual in a manner that would invade the individual’s reasonable expectation of privacy.

(4) An individual who is required to register as a sex offender under the sex offenders registration act, 1994 PA 295, MCL 28.721 to 28.736, shall not operate an unmanned aircraft system to knowingly and intentionally follow, contact, or capture images of another individual, if the individual’s sentence in a criminal case would prohibit the individual from following, contacting, or capturing the image of the other individual.

Privacy

General Public use of Drone: 259.322
“individuals' reasonable expectation of privacy” from drone photo, video, audio recording....
Privacy

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“individuals' reasonable expectation of privacy” from drone photo, video, audio recording.....

Privacy

**General Public use of Drone:** 259.322
“individuals’ reasonable expectation of privacy” from drone photo, video, audio recording.....

**State of Michigan use of Drone:** 259.307 - Facility consent, Warrant, Imminent Endangerment
Privacy

Any data, including videos, photographic images, or geospatial data, collected by the operation of an unmanned aircraft system concerning a facility described in subsection (1) shall be furnished promptly to the facility’s owner or operator upon request and shall be rebuttably presumed to be not subject to disclosure under the freedom of information act, 1976 PA 442, MCL 15.231 to 15.246.

**DEPARTMENT POLICY AND PROCEDURE**

**01-033 - EGLE Drone FOIA Procedure**

**Original Effective Date:** March 3, 2022  
**Distribution:** All EGLE Employees

**ISSUE**

Michigan’s Freedom of Information Act, 1976 PA 442, an amended (FOIA) states, “It is the public policy of this State that all persons...are entitled to full and complete information regarding the affairs of government and the official acts of those who represent them as public officials and public employees...The people shall be informed so that they may fully participate in the democratic process.”

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has a legal obligation to disclose all nonexempt public records in its possession pursuant to a FOIA request. EGLE acknowledges that sometimes it is necessary to invoke the exemptions identified under FOIA in order to ensure effective operation of government and to protect the privacy of individuals.

The Unmanned Aircraft Systems Act, 2015 PA 376, MCL 259.307(6) states, “Any data, including videos, photographic images, or geospatial data, collected by the operation of an unmanned aircraft system concerning a facility described in subsection (1) shall be furnished promptly to the facility’s owner or operator upon request and shall be rebuttably presumed to be not subject to disclosure under the freedom of information act, 1976 PA 442, MCL 15.231 to 15.246.

EGLE wishes to promote transparency, create consistency in asserting exemptions and applying reductions in the production of records in response to FOIA requests, and reduce its risks.
Township violated Michigan couple's privacy by using drone, court says

Beth LeBlanc  The Detroit News
Published 12:06 p.m. ET Mar. 19, 2021 | Updated 3:04 p.m. ET Mar. 19, 2021

A Michigan Court of Appeals panel ruled this week a northern Michigan township could not use drone photos it obtained without a search warrant to prove a resident wasn't complying with zoning rules.
Privacy

**Michigan Court of Appeals “Expectation” of Privacy -**

No one “expects” a drone to be looking in their backyard, even if flying legally in accordance with FAA and State Regs.

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**Township violated Michigan couple's privacy by using drone, court says**

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Privacy

“should have included some kind of inspection provision”
Privacy

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“..parties.. should have-included a monitoring or inspection provision in their agreement”

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Agencies have “inspection authority” in their statutes.
It is your Mission to protect the Environment, enforce laws, monitor habitat and agreements.
Privacy

Agencies have “inspection authority” in their statutes. It is your Mission to protect the Environment, enforce laws, monitor habitat and agreements.

You likely already use these type of Sensors (visual, cameras)
Drones bring your Sensor to the site so you can do your job better, safer.
Privacy
Privacy

If you have inspection authority in your permits/legal agreements, make sure it's clear and includes “aerial” in your inspection “tool box”, do not leave it implied.
Privacy

If you have inspection authority in your permits/legal agreements, make sure it’s clear and includes “aerial” in your inspection “tool box”, do not leave it implied.

Always ASK and OBTAIN consent before surveilling private property, similar to walking on.
The Use of Drones to Improve Planning and Assessment

Security
Security

Your Cell Phone Is Talking About You Behind Your Back

It's revealing personal details about your life to third party companies. But there are ways to protect your information!
The Use of Drones to Improve Planning and Assessment

Security with Drones can be fully addressed

During Flight Transmission -

Want to Make Sure Your DJI Drone Isn’t Sharing Your Data? Here’s What to Do

BY ZACC DUKOWITZ

5 June 2019
The Use of Drones to Improve Planning and Assessment

Security with Drones can be fully addressed

During Flight Transmission -
  Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
  Do not connection to Internet

Post Flight imagery security-
Security with Drones can be fully addressed

During Flight Transmission -
- Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
- Do not connection to Internet
- Conduct Flights in “Airplane Mode”

Post Flight imagery security-
The Use of Drones to Improve Planning and Assessment

Security with Drones can be fully addressed

During Flight Transmission -
Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
Do not connection to Internet
Conduct Flights in “Airplane Mode”
Fly Without SIM cards installed in Display phone

Post Flight imagery security-
Security with Drones can be fully addressed

During Flight Transmission -
  Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
  Do not connection to Internet
  Conduct Flights in “Airplane Mode”
  Fly Without SIM cards installed in Display phone
  Use “Local Mode” if available

Post Flight imagery security-
Security with Drones can be fully addressed

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Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
   Do not connection to Internet
   Conduct Flights in “Airplane Mode”
   Fly Without SIM cards installed in Display phone
   Use “Local Mode” if available
   Deleting all Flight Records/Flight Logs on Display phone

Post Flight imagery security-
Security with Drones can be fully addressed

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Minimize risk and concerns, from any manufacture, (including Chinese drones like DJI).
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Deleting all Flight Records/Flight Logs on Display phone

Post Flight imagery security-
Be prepared to adopt your Agency’s digital Business Confidential procedures
(e.g., Enforcement Cases, Sensitive Security Sites)
What is the ROI ($500-$2000 Drone)?

An extra 15-30 minutes of field time can provide a wealth of additional information. It can extend your field season into the winter months.
DISCOURAGEMENT

You Are The Wind Beneath My Wings, Otherwise Known as Turbulence.
UAS Uses, Examples, & Considerations in Environmental

**Emergency Response**

Kentucky: Belle Thomas, UAS Coordinator
Department of Environmental Protection,
Division of Waste Management
What kind of Emergency Responses would a UAS be beneficial at?

- Large spills or releases
- Fires
- Hazardous/dangerous incidents
- Inaccessible scenarios, i.e. hazardous terrain
- Any incident that would benefit from real-time assessment

- Safety is to human health & the environment of utmost importance. Including those who are responding to an emergency.
Large Releases:
Large Releases:
Fires (chemical):
Inaccessible Hazardous Environments
Inaccessible Hazardous Environments
Inaccessible Hazardous Environments
What to consider during an Environmental Emergency Response?

- Safety as the drone operator. What hazards will you encounter?
  - i.e. other drone operators, proximity to the incident, emergency vehicle traffic
- Would a BVLOS Waiver be beneficial?
- Do you have the capability to live stream?
  - Incident Command Drone Trailer, Update the main office
  - WiFi Hotspot, Microsoft Teams screen sharing within the organization,
UAS Drone use in Environmental Assessment
What can be done with drones that takes only pictures?

See places you can't access (Looking Glass River – high water)
What can be done with drones that takes only pictures?

Get perspective/scale of what you're dealing with.
Outdated Image in Google Earth
Photo layout - GeoSetter (free)
Updated Overlay in Google Earth - Orthomosaic
Current Digital Surface Model of Land Fill - runoff patterns
Current Contour Elevations of Land Fill - indications of sloping
3D representation of Drone Imagery Products
What can be done with drones that takes only pictures, enhanced by post-processing?

Remediation Verification
What can be done with drones that takes only pictures, enhanced by post-processing?

3D MODELS
LIMITATIONS

Until you spread your wings,
you'll have no idea how far you can walk.
Lessons Learned in EGLE UAS Drone Program
Lessons Learned in EGLE UAS Drone Program

- Incidents and Crashes
- Interesting Curveballs
- To Blue or Not to Blue
XII. FAA Field Documentation - EGLE UAS Incident Response Plan

Level: Green - Minor

Minor -
I. Reported in >> Pilot Log Notes, brought to TTC and TTDR attn.
II. Corrective Actions taken >> update preflight checklist

Minor Incident Examples:
Prop damage on takeoff or landing
Minor equipment damage - scuffing
Undetermined flying errors that result in safe recovery and landing
Public or Law Enforcement inquiry on Mission site with DEQ PIC

Level: Yellow-Major

Major -
I. Reported in >> Pilot Log Notes and brought to attention of TTC, TTDR, and MPT supervisor (signed off) attention within 24 hours, (e.g. email description). EM and Executive Office will be notified of the incident through the TTC of any costs to repair equipment. EM will be notified if the TTC feels the situation warrants.

II. Corrective Actions Taken >> DEQ Drone specific Flights Halted until Investigation and Diagnosis resolves issue to DEQ PIC, TTC, MPT supervisor (signed off). Checklist update and Restocking must be done before any new DEQ drone specific flights are made (email and note to TTC, TTDR, MPT Supervisor (signed off))

Major Incident Examples Are:
Equipment damage needing servicing (motors, IMU)
Undetermined flying errors that result in Crash and Recovery
Public/Law Enforcement Drone inquiry to DEQ Front Office (Notify EM of this issue)
Any type of injury to personnel below FAA/NTSB thresholds to PIC (Notify division safety liaison)

Level: Red-Catastrophic

Catastrophic - CE/FAA/NTSB Needs Notification
I. Reported ASAP >> TTC, TTDR, MPT Supervisor, DEQ LC.
II. Corrective Actions Taken:
DEQ LC submits FAA and NTSB reports within timeframe (10d)

Catastrophic Incident Examples:
Drone is lost – unaccounted for (stick to tracking all DEQ Drones)
Drone is crashed – extensive damage to equipment/total loss
Drone causes injury to PIC or property above FAA/NTSB thresholds, or any injury to any bystander
Public/Law Enforcement makes legal inquiry against DEQ Mission
Incidents and After Actions Taken

First Fly-Away (returned safely) - August 2017  Phantom 4 Pro
Incidences and After Actions Taken

First Fly-Away (returned safely) - August 2017  Phantom 4 Pro
Incidences and After Actions Taken

First Fly-Away (returned safely) - August 2017 Phantom 4 Pro
After Action: Proper procedure for stopping automated flight, and proper Return to Home put in Mission Planning Template
Incidents and After Actions Taken

First Crash Dec 2018 - M210 was loitering to bring down battery level to “storage capacity”, due to firmware issue, the Drone invoked self RTH and hit a tree on the way up. DJI replaced drone and camera.
Incidents and After Actions Taken

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https://coptrz.com › The Coptrz Blog

NEWS FLASH: DJI Matrice 200 Series Firmware Update - Coptrz

Fixed an issue where the battery level was not correct. the battery update will also calibrate the battery level. Be sure to update all of your batteries to ...

DJI Matrice 210 RTK V2 - Quadcopter - Wi-Fi

$11,125.80

DJI Zenmuse XT2 Radiometric, 640, 19mm, 9Hz

$11,638.65 ($10,769.50)
Incidences and After Actions Taken

First Crash Dec 2018 - M210 was loitering to bring down batterie level to “storage capacity”, due to firmware issue, the Drone invoked self RTH and hit a tree on the way up. DJI replaced drone and camera.

After Action: no loitering needed as batteries are self discharging...no loitering under trees

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Incidences and After Actions Taken

Second Crash July 2020 - M2Pro Sanford Dam picture flight
Incidents and After Actions Taken

Second Crash July 2020 - M2Pro Sanford Dam picture flight...
Incidences and After Actions Taken

Second Crash July 2020 - M2Pro Sanford Dam picture flight... Drone Struck a limb on a reverse camera shot. Instead of landing on the sand, pilot tried to bring it back pressing RTH. In flight, arm collapsed in and Drone landed hard from 30 ft.
Incidents and After Actions Taken

Second Crash July 2020 - M2Pro Sanford Dam picture flight... Drone Struck a limb on a reverse camera shot. Instead of landing on the sand, pilot tried to bring it back pressing RTH. In flight, arm collapsed in and Drone landed hard from 30 ft. DJI repair serviced - $400

After Action: If a drone hits something, land as soon as possible, do not fly it home. Don’t count on collision avoidance, fly safe at all times.
Incidences and After Actions Taken

Most Famous Incident August 2020
   EAGLE takes down EGLE Drone conducting a shoreline assessment over Lake Michigan
Incidences and After Actions Taken

Most Famous Incident August 2020
   EAGLE takes done EGLE Drone conducting a shoreline assessment over Lake Michigan
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Incidences and After Actions Taken

Most Famous Incident August 2020
EAGLE takes done EGLE Drone conducting a shoreline assessment over Lake Michigan
After Action: Painted “eyes” on all Phantom 4 Adv Drones, Look around for birds of prey, instituted evasive maneuvers (up/over) if approached on attack line
Review “find my drone” procedures - “last ping” location
Incidents and After Actions Taken

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Review “find my drone” procedures - “last ping” location

My “15 minutes of fame” was not all I thought it would be...
Monthly Fit4Service and Pilot Active Status invoked in 2020 Policy Update
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Additional incidents during Fit4Service:

2021 Parrot Anafi - Broken Prop during F4S flight
After Action: Inspect Parrot props for strength at motor...rubber band props when in case (don’t flop around)

2020 Spark hit indoor warehouse wall - During Monthly Practice - Atti mode (no gps) drifted
After Action: Pay attention! Collision Avoidance did not save Drone - Pilot replaced Drone ($250)

2020 Phantom 3 Advanced hit indoor trailer -During Monthly Practice- Atti mode (no gps) drifted
After Action: - Pay attention! Pilot Replaced Drone ($200)
Monthly Fit4Service and Pilot Active Status invoked in 2020 Policy Update

Additional incidents during Fit4Service:

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2020 Phantom 3 Advanced hit indoor trailer - During Monthly Practice - Atti mode (no gps) drifted
   After Action: - Pay attention! Pilot Replaced Drone ($200)

“The master has failed more times than the beginner has even tried.”
— Stephen McCranie
Interesting Curve Balls in the EGLE Drone Program

EGLE Drone Program - Policy is changing faster than we can update it
Interesting Curve Balls in the EGLE Drone Program

EGLE Drone Program - Policy is changing faster than we can update it

Presidential Memorandum Language - Accepting Federal Funding
Interesting Curve Balls in the EGLE Drone Program

EGLE Drone Program - Policy is changing faster than we can update it

Presidential Memorandum Language - Accepting Federal Funding

New FAA Remote ID requirements / BVLOS Certifications - September 2023
Interesting Curve Balls in the EGLE Drone Program

EGLE Drone Program - Policy is changing faster than we can update it

Presidential Memorandum Language - Accepting Federal Funding

New FAA Remote ID requirements / BVLOS Certifications - September 2023

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ANYBODY Using a Drone In Michigan

**** 259.322 new THIS NEW SECTION IS EFFECTIVE APRIL 4 2017 ****

250.322.new Operation of unmanned aircraft system; harassment, violation of order, or
invasion of privacy prohibited; definition; individual registered as sex offender.
Sec. 22. (1) A person shall not knowingly and intentionally operate an unmanned aircraft system to subject
an individual to harassment. As used in this subsection, “harassment” means that term as defined in section
411a or 411l of the Michigan penal code, 1931 PA 328, MCL 750.411a and 750.411l.
(2) A person shall not knowingly and intentionally operate an unmanned aircraft system within a distance
that, if the person were to do so personally rather than through remote operation of an unmanned aircraft,
would be a violation of a restraining order or other judicial order.
(3) A person shall not knowingly and intentionally operate an unmanned aircraft system to violate section
259 of the Michigan penal code, 1931 PA 328, MCL 750.259, or to otherwise capture photographs, video,
or audio recording of an individual in a manner that would invade the individual’s reasonable expectations of
privacy.
(4) An individual who is required to register as a sex offender under the sex offenders registration act,
1994 PA 293, MCL 28.721 to 28.746, shall not operate an unmanned aircraft system to knowingly and
intentionally follow, contact, or capture images of another individual, if the individual’s sentence in a criminal
case would prohibit the individual from following, contacting, or capturing the image of the other individual.
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Latest wrinkle - April 21, 2022  Citizen submitted imagery of others property “violation”

Is it “surveillance”?

Did it cross the line as “invasion of privacy”? Was there an expectation of privacy?

Is citizen drone imagery of other private property legal?

Can EGLE be FOIA’d for other peoples submitted drone pictures of private property violations?

Was there potential for imminent risk?

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ANYBODY Using a Drone In Michigan
AMBITION

The Journey of a Thousand Miles Sometimes Ends Very, Very Badly.
To Blue or Not to Blue
To Blue or Not to Blue

1. In EGLE - All imagery is subject to FOIA release...its all public
   *If your agency UAS imagery is public - China could just FOIA you for it*

2. In EGLE - Security Risk is mitigated...
   *All Agencies can fly drones WITHOUT AN INTERNET CONNECTION*

3. What is available freely on the Internet (ESRI World Imagery, Google Earth) in terms of resolution is vast
   *Is the imagery you are collecting a threat to national security, or is it already publicly available on the web?*(cognizant of PPI, faces, situations)...see 2 above.

4. Any Bad Actor (terrorist, communist sympathizer) can go to Best Buy, or Amazon, purchase a non-blue Drone, fly it legally, and take imagery to send back to China, Russia, via email, if they so chose.
   *Why would they need to intercept your agencies imagery when they could collect it themselves?*
The State of Michigan pays Contractors to Image the entire State of Michigan

### MiSAIL Program Services
2021-2024

Click the links for more information:

<table>
<thead>
<tr>
<th>Vendor Name</th>
<th>Ortho Imagery</th>
<th>Lidar</th>
<th>Oblique Imagery</th>
<th>Third Party</th>
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<td>Third Party Satellite ortho imagery acquisition and viewing service through Planet</td>
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</table>

MiDEAL  [https://www.michigan.gov/dttmb/0,5552,7-358-82550-85753---00.html](https://www.michigan.gov/dttmb/0,5552,7-358-82550-85753---00.html)

DTMB Procurement  [https://www.michigan.gov/dttmb/0,5552,7-358-82550---00.html](https://www.michigan.gov/dttmb/0,5552,7-358-82550---00.html)

*Each vendor may have additional services available that can be purchased through these contracts.*
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ABOUT OUR COVERAGE

We regularly capture and publish imagery covering 90% of the Australian population — 118 urban areas encompassing more than 130,100 unique square kilometres annually, and growing. Our coverage map shows both existing and planned coverage. Keep up to date with our coverage updates by subscribing to our newsletter.

How often do we fly?

We add new content for major Australian metros frequently, subject to weather and other conditions. The resolution is 5.5cm-7.5cm, although we may capture areas at higher resolution in some circumstances. Take a look at our coverage map for update frequency and other information.
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China does not need your Agency’s UAS Imagery - it can freely buy coverage from a vendor
5. Private Satellite imagery is far superior to any UAS imagery your agency will take, and for sale to those willing to pay.

NY Times, USA Today, CNBC, BBC, etc......
6. If you think Private Satellite imagery is good, imagine how good (Chinese and Russian) Military Satellite Imagery is. Your UAS imagery is not needed.

Top Secret
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The Security Risks from using DJI (foreign) drones can be (and are) mitigated in EGLE.
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State of Michigan, Emergency Response, First Responder UAS operations should use the best, safest, aircraft available. Our Missions depend on it.
To Blue or Not to Blue -

Use the best, safest, most reliable aircraft available. Period.

DJI Inspire 2
To Blue or Not to Blue -

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The use subpar aircraft (GPS, transmission range, motors, escs, IMU, and apps) may introduce a much greater risk to personnel, operations, and people on the ground than Foreign manufactured aircraft, at no benefit to any adversary, and to the detriment of Agency Operations.

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AO IMHO-Stay away from Pixhawk-Cube based Flight Controllers....flight safety is compromised!

https://www.aerosystemswest.com › product-page › blue-c... 
Cubepilot The Blue Cube H7 - Pixhawk 2.1 - Aero Systems ...
Blue Cube H7 Specifications ; Frequency, 400MHz ; I/O PWM Voltage, 3.3V/5V ; RAM, 1M ; Flash, 2M ; Weight, 31.8g.
RAM: 1M 
Flash: 2M 
Processor: STM32H753 
Weight: 31.8g
$600.00 · In stock
FORESIGHT

 Those who say it cannot be done
 should not interrupt those busy proving them right.
EGLE Drone Program Metrics
Aerial Drone Use in EGLE is growing steady as opportunities/adoption increases.
Aerial Drone Use in EGLE is growing steady as opportunities/adoption increases

**EGLE Total Drone Missions 2017-2021**

- **2021**: 118
- **2020**: 89
- **2019**: 74
- **2018**: 110
- **2017**: 10

**EGLE 2021 Drone Missions by Division**

- MMD: 46
- RRD: 30
- AOD: 27
- WRD: 13
- OGMD: 2

118 Missions in 2021
Aerial Drone Use in EGLE is growing steady as opportunities/ adoption increases

EGLE Total Drone Missions 2017-2021

EGLE 2021 Drone Missions by Division

Monthly EGLE Drone Use 2017-2021

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9 Staff in Training (Supervisor/Division approved)
33 Staff in Drone Program Total
40 Aircraft
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EGLE Drone Program – the past

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EGLE Drone Program

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Renewed: $75,000 for FY22, FY23, FY24

This funding over the next 3 years is anticipated going towards:

- Base support and supplies: Batteries, propellers, sensors ($25,000)
- New Drones for entry level and high-end applications ($25,000)
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Divisions have sought out Supplemental Grants to fund Specific Projects:
WRD- EPA GLNPO, Wetland Dedicated Funds  AQD-EPA MOOSE  MMD-Homeland Security
2021 Highlights - Projects - Accomplishments
Moved all Drone reporting from .xls to EGLE-TEAMS

Fit4Service Inspections
Pilot Flight Status: Active vs Inactive
Mission Reporting
Incident Reporting

Conducted Monthly TEAMS Mtgs: Coordinator + Division Reps + Pilots
Conducted Monthly IMD Oversite Program Calls (Brad + Art)
2021 Highlights - Projects - Accomplishments

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EGLE Drone Imagery Disclosure Policy

AQD >> MOOSE initiative - DR2000 Mobile Air Lab
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EGLE Drone Program Outreach >> MDOT Wetland Mapping (Phragmites)
EGLE Drone Program Outreach >> Saginaw Chippewa Tribe (Wild Rice Assessment)
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The EGLE Drone Program is outstanding in the Field.
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Drones in EGLE

Collaboration - Questions?

Art Ostaszewski
EGLE - Drone Program Coordinator
Ostaszewskia@Michigan.gov
517-936-7991