HCR

6

<TARGET><BILL>HCR 6</BILL><SUBJECT>HCR
6</SUBJECT><COMM>SSTA28</COMM></TARGET>

SENATE COMMITTEE REPORT

DATE: 4/1/13

FURTHER:

DATE TURNED IN TO OFFICE: 4/6/13

State Affairs Committee considered CS FOR HOUSE CONCURRENT RESOLUTION NO. 6(EDT)

HCR 6-EST. LEG. TASK FORCE ON UNMANNED AIRCRAFT

Recognizing the Alaska Center for Unmanned Aircraft Systems Integration at the University of Alaska Fairbanks as a national leader in unmanned aircraft research and development; and relating to a Task Force on Unmanned Aircraft Systems.

and recommends:

[ ] be **replaced** with **SCS** _____ (_____) *[ ] Same Title [ ] Technical Title Change [ ] New Title/SCR No._____*

[ ] adopt **previous SCS** _____ (_____) *[ ] Same Title [ ] Technical Title Change [ ] New Title/SCR No._____*

[ ] attached amendment(s)

[ ] adopt _____Letter of Intent

[ ] further referral to _____Committee

Dept Abbr.	
ADM	LWF
CED	LAW
COR	LEG
CRT	MVA
EED	DNR
DEC	DPS
DFG	REV
GOV	DOT
DHS	UA

NEW FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #
LEG		✓		2

PREVIOUS FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #

[ ] **APPROPRIATION - no fiscal note**

SIGNATURES AND RECOMMENDATIONS:	PRINTED LAST NAME	DO PASS	DO NOT PASS	NO REC	AMEND
	Wielechowski			✓	
John Coghill	Coghill			✓	
CHAIR: Fred Dyson	Dyson	✓			

ALASKA STATE LEGISLATURE

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Representative Shelley Hughes
House District 8 - Greater Palmer

Senate State Affairs Committee
State Capitol, Room 121
Juneau, AK 99801

HCR6 Unmanned Aircraft Task Force

Sponsor Statement
April 1, 2013

HCR6 recognizes the accomplishments of the University of Alaska Fairbanks, Center for Unmanned Aircraft Systems Integration and the research conducted to advance this technology in a safe manner. The research team at the Center has proven that unmanned aircraft can complete tasks more efficiently than traditional means, provide better information, and reduce life safety risks to animals and humans.

HCR6 also recognizes that with new technology comes the need to revisit certain laws to ensure the safety of our citizens and protect their privacy. This resolution forms a task force made up of legislators, government officials, and industry members. The task force will consider recommendations for privacy, appropriate use, and possible remedies for misuse. A preliminary report to the legislature is due in January 2014 and a final report of recommendations due January 2015.

While national news has sparked debate regarding the privacy concerns and the use of "drones" in U.S. National Airspace, Alaska has responsibly used unmanned aircraft for more than ten years. Some privacy concerns are due to limited understanding of this technology and some concerns are justified. The task force will consider regulation already in place by the Federal Aviation Administration and industry codes of conduct while reviewing Alaska state laws to determine the changes that may be necessary to protect the privacy of all Alaskans.

CS FOR HOUSE CONCURRENT RESOLUTION NO. 6(EDT)

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-EIGHTH LEGISLATURE - FIRST SESSION

BY THE HOUSE SPECIAL COMMITTEE ON ECONOMIC DEVELOPMENT, TRADE, AND TOURISM

Offered:
Referred:

Sponsor(s): REPRESENTATIVES HUGHES, Kawasaki, Isaacson, Pruitt

A RESOLUTION

Recognizing the Alaska Center for Unmanned Aircraft Systems Integration at the University of Alaska Fairbanks as a national leader in unmanned aircraft research and development; and relating to a Task Force on Unmanned Aircraft Systems.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the Unmanned Aircraft Systems Program at the University of Alaska Fairbanks has, since 2001, been designing payloads and upgrades for unmanned aircraft systems, testing and evaluating their safety and effectiveness, developing and demonstrating new uses for various potential users, working with the Federal Aviation Administration to make the use of unmanned aircraft systems safe, and developing technology to improve safety and is known across the nation for its leadership in advancing the state of the art and the safe use of unmanned aircraft systems; and

WHEREAS the importance of the program's work to the state was recently recognized by the Board of Regents of the University of Alaska when the regents established the Center for Unmanned Aircraft Systems Integration at the University of Alaska Fairbanks to continue research and development of unmanned aircraft systems for the benefit of the

state; and

WHEREAS the legislature recognizes the Alaska Center for Unmanned Aircraft Systems Integration at University of Alaska Fairbanks as the state's leader in unmanned aircraft systems research, meeting the goals of industry, the Federal Aviation Administration, and government operations; and

WHEREAS the legislature has provided significant financial support to the Alaska Center for Unmanned Aircraft Systems Integration at University of Alaska Fairbanks to further the center's research initiatives, and to increase its capabilities for use as a possible Federal Aviation Administration test site; and

WHEREAS the State of Alaska, the University of Alaska, the Alaska Aerospace Corporation, the Alaska Aviation Safety Project, and other public and private institutions have developed cooperation with the National Aeronautics and Space Administration, the Federal Aviation Administration, the United States Department of the Interior, the United States Department of Defense, and others to further advance the research, development, and use of technology to benefit and support Alaskans and Americans with the safe use of unmanned aircraft systems; and

WHEREAS Alaska state government and the state's business and research community continue to work with the Federal Aviation Administration to promote the establishment of safe unmanned aircraft system ranges onshore and offshore Alaska, which will help establish procedures for the safe operation of unmanned aircraft systems in the National Airspace System; and

WHEREAS the Alaska Center for Unmanned Aircraft Systems Integration, by virtue of being located in Alaska, has access to an area of geographic and climatic diversity where the air and surface population density is desirable for conducting research and development of unmanned aircraft systems; and

WHEREAS the state has the highest per capita use of general aviation activity in the nation, and Alaska aviation organizations have helped the Federal Aviation Administration develop the next generation of air traffic control for the nation and the world, while making major gains for the state's aviation safety in the process; and

WHEREAS unmanned aircraft systems may present a risk to privacy, but neither the Federal Aviation Administration nor any other state or federal agency currently has specific

statutory authority to regulate privacy matters relating to unmanned aircraft systems;

BE IT RESOLVED that the Alaska State Legislature recognizes the Alaska Center for Unmanned Aircraft at the University of Alaska Fairbanks as a leader in aviation pioneering and further recognizes the significant benefit to the state and nation the center provides in research and development of unmanned aircraft systems; and be it

FURTHER RESOLVED that the Alaska State Legislature fully supports the efforts of the Alaska Center for Unmanned Aircraft Systems Integration at the University of Alaska Fairbanks to become one of the nation's six test sites for unmanned aircraft systems testing and research; and be it

FURTHER RESOLVED by the Alaska State Legislature that the Task Force on Unmanned Aircraft Systems is created in the legislative branch and shall consist of 15 members, who, except for the member from the senate and the member from the house of representatives, shall be appointed jointly by the president of the senate and the speaker of the house of representatives, as follows:

(1) one senator selected by the president of the senate, who shall serve as co-chair;

(2) one representative selected by the speaker of the house of representatives, who shall serve as co-chair;

(3) the commissioner of transportation and public facilities or the commissioner's designee;

(4) the commissioner of public safety or the commissioner's designee;

(5) the commissioner of natural resources or the commissioner's designee;

(6) one member representing municipal law enforcement;

(7) the attorney general or the attorney general's designee;

(8) the commissioner of fish and game or the commissioner's designee;

(9) the adjutant general of the Department of Military and Veterans' Affairs or the adjunct general's designee;

(10) a member representing the Alaska Center for Unmanned Aircraft Systems Integration at University of Alaska Fairbanks;

(11) a member of the Academy of Model Aeronautics;

(12) a member from the Aviation Advisory Board;

(13) a member from the Medallion Foundation;

(14) one member of the Aerospace States Association;

(15) one member of the Alaska UAS Interest Group; and be it

FURTHER RESOLVED that a vacancy on the task force shall be filled in the manner of the original appointment; and be it

FURTHER RESOLVED that the duties of the task force shall include

(1) reviewing regulations and guidance from the Federal Aviation Administration regarding unmanned aircraft systems;

(2) providing written recommendations, together with suggested legislation, for a comprehensive state policy for unmanned aircraft that protects privacy and allows the use of unmanned aircraft systems for public and private applications; and

(3) submitting, not later than January 15, 2014, an initial report to the legislature and, not later than January 15, 2015, submitting a final report to the legislature; and be it

FURTHER RESOLVED that the task force may meet as frequently as necessary to carry out its responsibilities; and be it

FURTHER RESOLVED that the task force may meet during and between legislative sessions and may request administrative and technical support from the University of Alaska Fairbanks; and be it

FURTHER RESOLVED that the public members of the task force serve without compensation but are entitled to per diem and travel expenses authorized for boards and commissions under AS 39.20.180; and be it

FURTHER RESOLVED that the task force terminates on January 15, 2015.

FISCAL NOTE

STATE OF ALASKA
2013 LEGISLATIVE SESSION

Bill Version: **HCR6**
Fiscal Note Number:
() Publish Date:

Identifier (file name): HCR6-LEG-SESS-03-25-13
Title: Establishing Legislative Task Force on Unmanned Aircraft.....
Sponsor: Hughes, Kawasaki, Isaacson, Pruitt
Requester: Representative Hughes

Dept. Affected: Alaska Legislature
Appropriation: Legislative Operating Budget
Allocation: Session Expenses
OMB Component Number: 782

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	FY14 Appropriation Requested	Included in Governor's FY14 Request	Out-Year Cost Estimates				
OPERATING EXPENDITURES	**FY14**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants, Benefits							
Miscellaneous							
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

FUND SOURCE		(Thousands of Dollars)						
1002	Federal Receipts							
1003	GF Match							
1004	GF							
1005	GF/Prgm (DGF)							
1037	GF/MH (UGF)							
1178	temp code (UGF)							
TOTAL		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

POSITIONS							
Full-time							
Part-time							
Temporary							

CHANGE IN REVENUES							

Estimated SUPPLEMENTAL (FY13) operating costs _____ *(separate supplemental appropriation required)*
(discuss reasons and fund source(s) in analysis section)

Estimated CAPITAL (FY14) costs _____ *(separate capital appropriation required)*
(discuss reasons and fund source(s) in analysis section)

ASSOCIATED REGULATIONS
Does the bill direct, or will the bill result in, regulation changes adopted by your agency? _____
If yes, by what date are the regulations to be adopted, amended, or repealed? _____ Discuss details in analysis section.

Why this fiscal note differs from previous version (if initial version, please note as such)

Initial Version

Prepared by: Jessica Geary, Finance Manager — Phone: 465-6626
Division: Legislative Affairs Agency — Date/Time: 3/25/13 11:17am
Approved by: Pamela Varni, Executive Director — Date: 3/25/2013
Legislative Affairs Agency

(Revised 1/15/2013 OMB)

FISCAL NOTE ANALYSIS

STATE OF ALASKA
2013 LEGISLATIVE SESSION

BILL NO. HCR6

Analysis

This Legislation has zero fiscal impact on the Legislative Affairs Agency.

Unmanned Aircraft Systems for Alaska

Ro Bailey
Deputy Director
Alaska Center for Unmanned Aircraft Systems Integration
(907) 455-2104

Roadmap

- University of Alaska UAS history
  - Vision, mission, why unmanned
- Projects & why they matter to Alaska
  - Economic value
  - Science, engineering, & safety value
- FAA Test Site Proposal
- What about privacy? Law Enforcement?
- House Concurrent Resolution No. 6

UAF's History of Unmanned Aircraft

- 2001 - Partnership with New Mexico State University
  - Tasked to develop applications within the Technical Analysis and Applications Center (TAAC)
- 2003/2004 - Funded to work with USAF and USCG
  - Maritime domain awareness
  - Wildfires in the Interior of Alaska
- 2006 - Acquired first ScanEagle with 50% loan from University Foundation
- 2007 to present - Multiple missions for science, emergency response, humanitarian needs, and engineering development
- Today our unmanned aircraft fleet is diverse and growing
  - Existing fixed wing systems
  - Existing rotor systems
  - Developing new systems

First UAF Launch

UAF UNIVERSITY OF ALASKA FAIRBANKS

Meeting Alaska's Needs

- Research
  - Science
  - Engineering
- Public Safety / Emergency Response
- Natural Resource Management

Value to Alaska

- UAF alone has brought in over $4.5 M
- Technology
  - Three small company start-ups since 2010
  - Two aerospace companies opened/opening offices in Fairbanks—one is ARTIC, or Atkinson Robotics and Technology Integration Corporation
  - Both Alaskan and Outside companies partnering with UAF to pursue FAA Test Site
- Value to Alaska business
  - Fish & game management & protection
  - Support oil industry, mining, fisheries, others

Economic Impact in Alaska

Before Expected Impact of a Test Range Designation

NES
Northern Embedded Solutions

CTC Concurrent Technologies Corporation

ATKINSON Aeronautics & TECHNOLOGY

MOBILE MAPPING CORPORATION

ati

Polartronix

ADS-B Technologies™

Alaska-based development partners

Expected Value

- Value to Alaska
  - Better deploy wildfire fighters
  - Support disaster response
  - Assess/protect transportation routes—e.g., monitor slopes
  - Search & rescue in remote areas
  - High resolution mapping
  - Infrastructure monitoring
  - Oil spill response & monitoring
  - Counter unilateral Federal decisions with facts
  - River monitoring during breakup

Why Unmanned?

- Risky work: over remote, extreme terrain or unreachable locations in volatile weather conditions
  - Nov 1999: Helicopter crashed, two Nez Perce biologists conducting surveys seriously injured
  - Polar & distant maritime locations
- Dirty work: observations over chemical spills, volcanoes, wildfire smoke
- Dull: capturing thousands of photos to process into 3D maps is boring, repetitive work
- Other means not possible
  - Monitoring sea ice from under 1000 ft
  - Flying through volcanic ash plumes

What Alaska Offers

- Vast open airspace with little traffic
- Wild, extreme, unpopulated, diverse terrain
- Access to large military ranges with data gathering ability
- History of pioneering aviation technology
- Culture of innovative use of aviation
- Close relationship with regional FAA
- Perhaps most important, willingness to be thoughtful and methodical in potential policy decisions

Vision

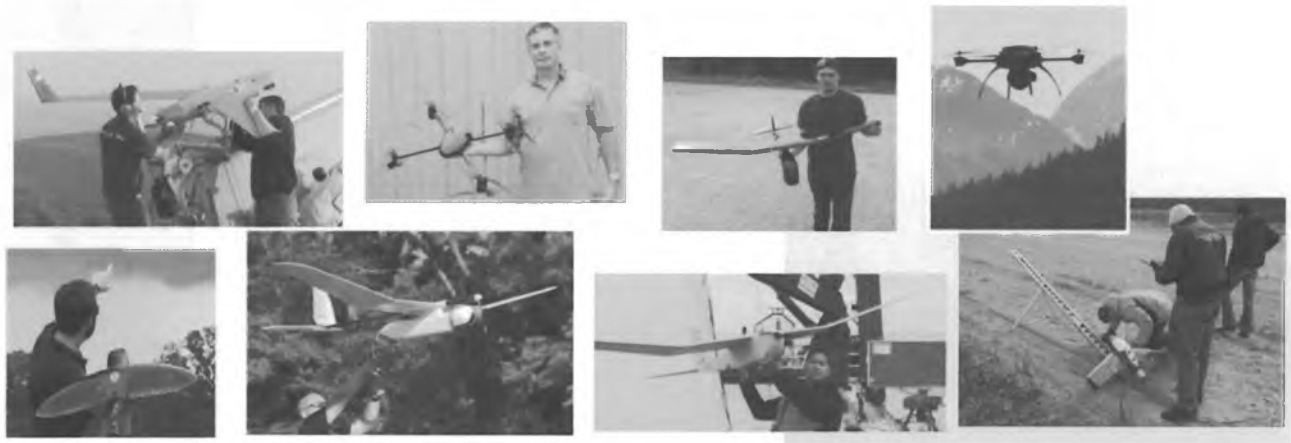
Develop, test, and ultimately exploit emerging unmanned aircraft technology and its uses to create a positive economic and social benefit within the State of Alaska.

When the cost of the hardware is no longer a factor what will people do with the capability?

- Plan today to prepare for the future
- Develop what is needed to support
- Participate in policy development for benefit and protection of Alaska & the nation

Mission Statement

A research center for small, unmanned aircraft systems providing integration of unique payloads and supporting pathfinder missions within government and science communities, with a special emphasis on the Arctic region.

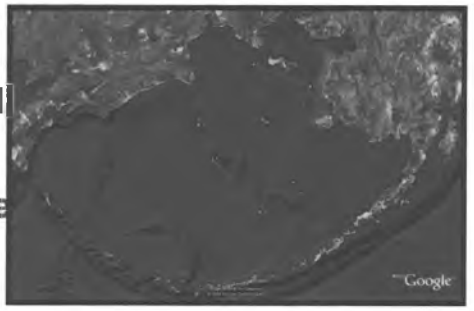


Conducted over 150 mission flight days worldwide in 2012

The Evidence: a sample of projects

Ice Seal Population Study

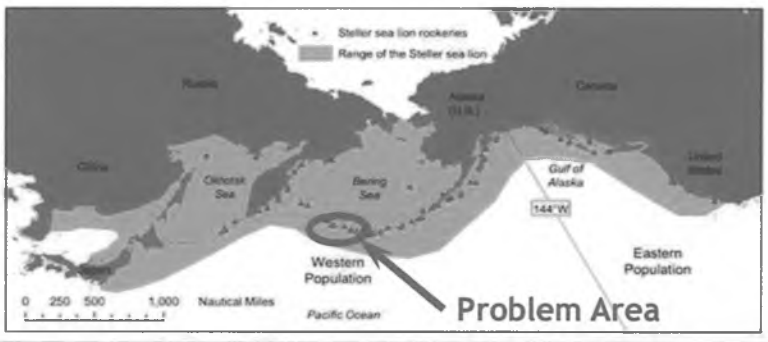
- Scientific Need
  - Marine Mammal Protection Act mandated
- Relevance
  - Large-scale, systematic ship-based surve
- Outcome
  - Safer (than manned aviation)
  - More effective (they do not startle seals)
    - vs. manned fixed wing or helicopters



2009 First Deployment
2014 Proposed Expanded Survey
Joint NOAA and US Navy Funded

Augmenting Steller Sea Lion Surveys
Western Aleutians

- Problem: Biological opinion, based on limited observations, eliminated a commercial fishery
- Goal: Demonstrate a method to collect high quality imagery for population surveys in hard to observe areas
- Possible Benefit: Improved understanding of animal use of and movement through their habitat



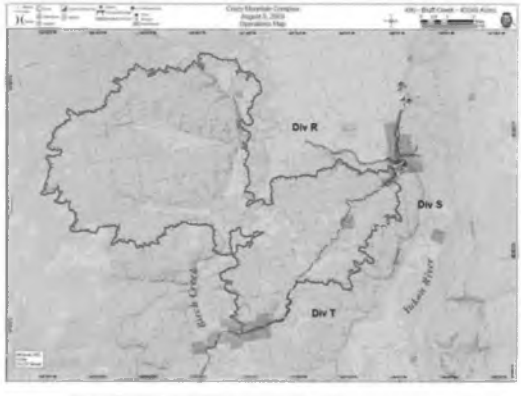
Steller Sea Lion Habitat Monitoring

Preliminary Findings
- **Migration Patterns**
- **Transient Killer Whales**

Crazy Mountain Wildfire

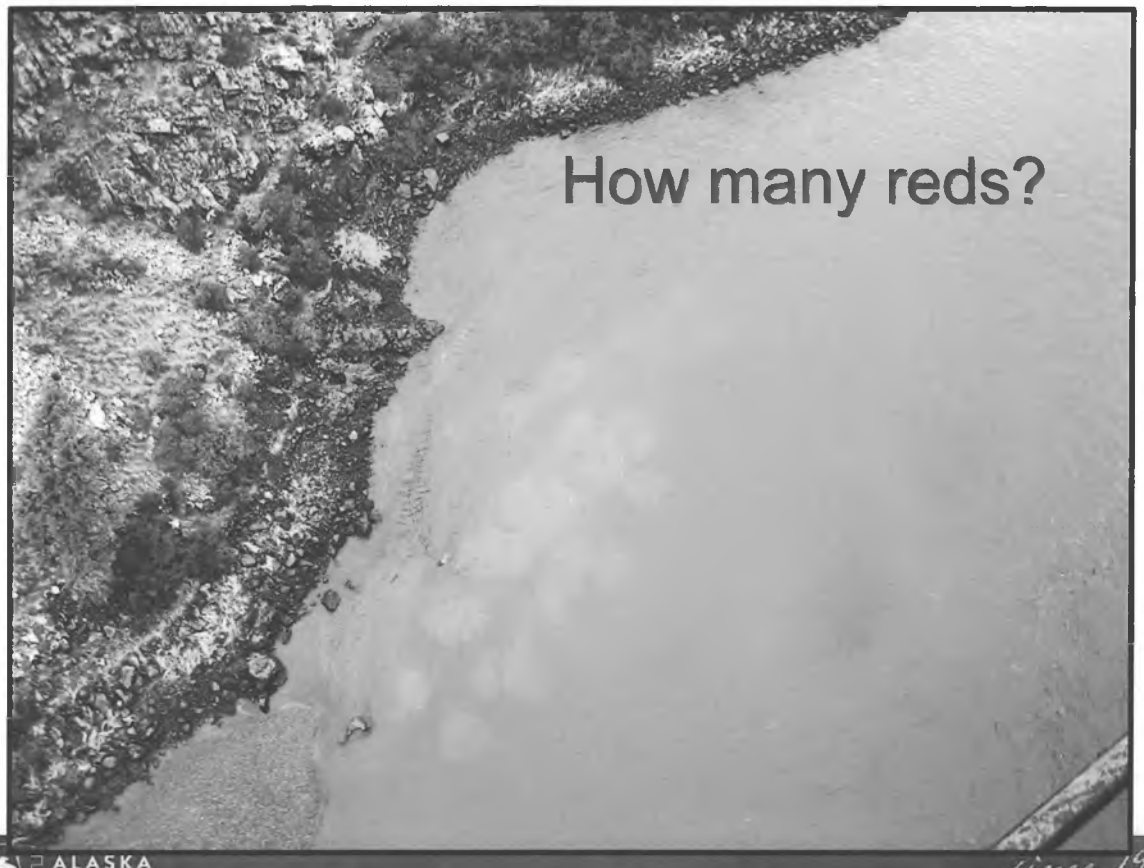
Alaska Fire Service Incident Command Team Support

- **Tasked by Alaska Fire Service Incident Command Team**
- **Manned aviation not flown for 5 days due to the smoke and limited visibility**
- **Satellite imagery (MODUS) incapable of showing critical activity**



Salmon Spawning Habitat
October - December 2012

- **Mapping Fall Salmon Nests along a 162 km of the Snake and Clearwater River in Idaho, Washington, and Oregon**
- **"THREATENED" under the Endangered Species Act**



Fish Habitat Data Products

Weekly Mosaic Images of Select Sites

Rx-CADRE

Prescribed Fire Combustion and Atmospheric Dynamics Research Experiment

- October 29 - November 17 2012
- Eglin AFB Florida

Bear Bite - SAREX

Mass Casualty Exercise 7-10 February 2013

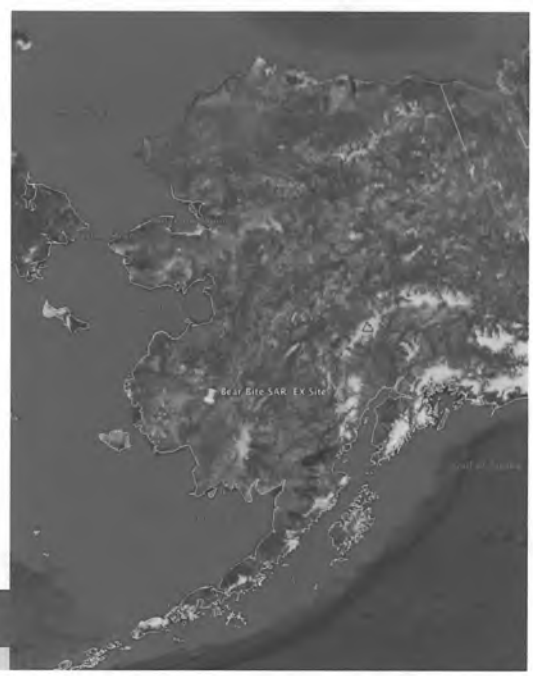
"An aircraft crashed in the tundra roughly 20 miles outside Bethel Alaska many died with some survivors"

Deployed two unmanned aircraft systems with support team

Coordinated with manned aviation on the scene

Mission:

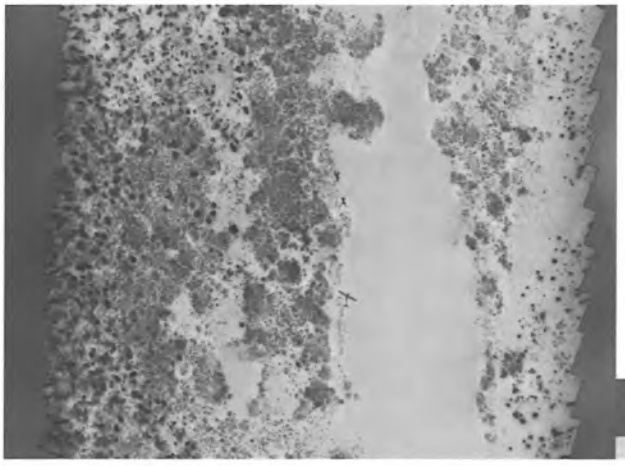
- **Map scene for event documentation**
- **Real-time SAR response**



UAF UNIVERSITY OF ALASKA FAIRBANKS

Bear Bite - SAREX

"I've worked with the MQ9 and the MQ1 before and when compared these products were pretty sweet" - SAR Duty Officer statement at after action review 11 Feb 2013. "Within just a couple hours imagery was collected and turned into mosaic products in the field"



Bear Bite - SAREX

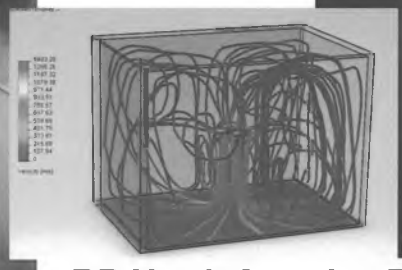
cold weather operations – our most challenging yet

Shoreline Clean-up Assessment Technique (SCAT) Evaluation

BP Exploration (Alaska) Inc. Partnership

Oil Infrastructure Monitoring Research

- Flare Stacks
- Pipelines
- Processing Facilities
- Access Roads



BP North America Partnership

High Arctic Ship Piloting Experiments

Aboard the Canadian CCGS LOUIS S. ST. LAURENT

Phase I Research conducted by Capt Stephen Wackowski (USAF)

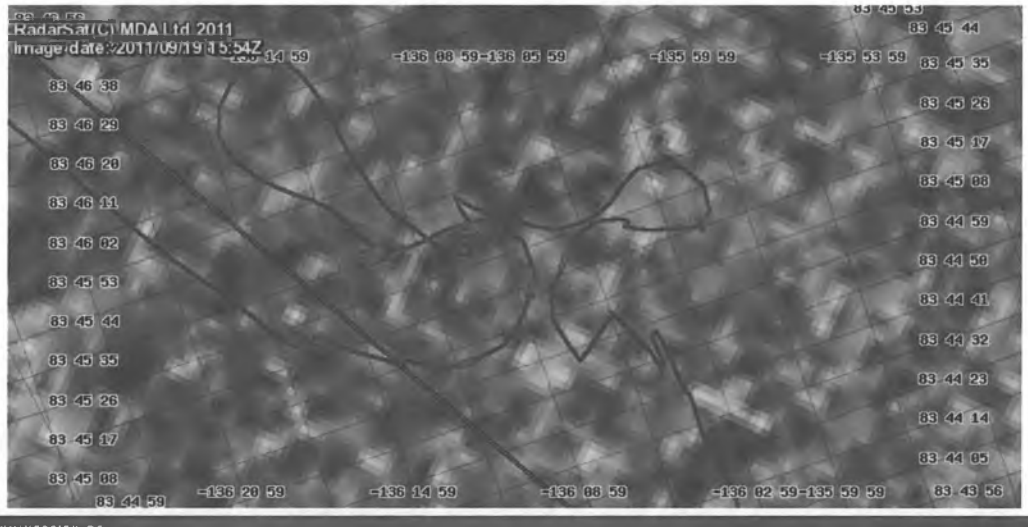
Phase II Ongoing with UAF graduate students with modified Raven systems acquisition

Imagery Used For Ship Piloting in Ice

Ship tracks superimposed (Sept 2011)

Background Image: National Ice Center highest resolution RADARSAT

- **Desired icebreaker track (green)**
- **Actual navigation track (red)**



Small UAS Imagery of Ice Ridges

IR image from RAVEN UAS (Sept 2011)

Navigating Sea Ice during the Nome Fuel Delivery

University Engagement and Decision Support

Mission

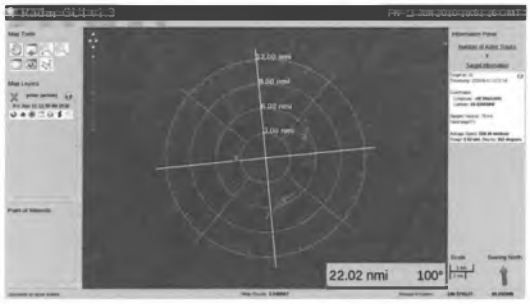
1. Identify potential safety concerns for those working on the ice
2. Document the site for mission response activity
3. Collect imagery for the USCG Public Affairs Officer

iPASS

UAF's Portable Airspace Surveillance System

Designed and built by UAF for Alaska's airspace monitoring needs

Status
Operational, used in Canada and NASA Certified



Airspace activity monitoring
Monitors airspace use patterns and validates traffic pattern assumptions

Enhanced situational awareness during aircraft or spacecraft operations
Provides real-time position and track of local airspace activity to assist in traffic avoidance

Ongoing UAS Survey of Marine Debris

Generated by 2011 Japanese Tsunami

NOAA Funded Effort

Partnering with a Wasilla Alaska based UAS Manufacturer Airborne Technologies Inc

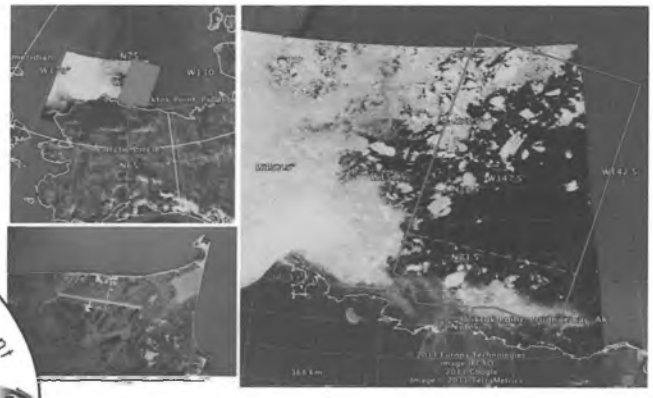
Upcoming ACUASI Projects

Marginal Ice Zone Ocean and Ice Observations and Processes EXperiment (MIZOPEX)

UAF deployments

NASA Exercise July 2013

Preparation May/June 2013



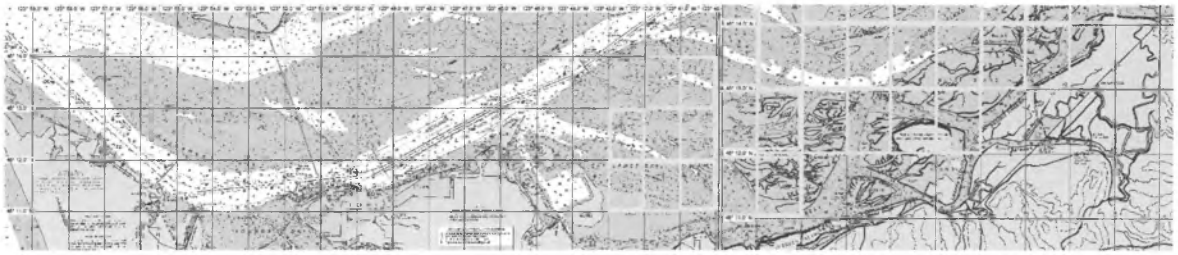
Multiple aircraft simultaneously
Many new scientific payloads

Alaska Department of Public Safety

- **Provided demonstration of a vertical takeoff UAS**
- **Provided concepts in which a UAS could be used including:**
  - **Forensic evidence at crash or crime scene**
  - **Search and rescue**
  - **Wildlife protection**
- **Provide UAS subject matter expert as AST forms its concept of operations**
- **Possible development of UAS training package to train State troopers**
- **Supporting any FAA interaction needs**
- **Providing connections to legal experts on privacy**

Most Recent ACUASI Project

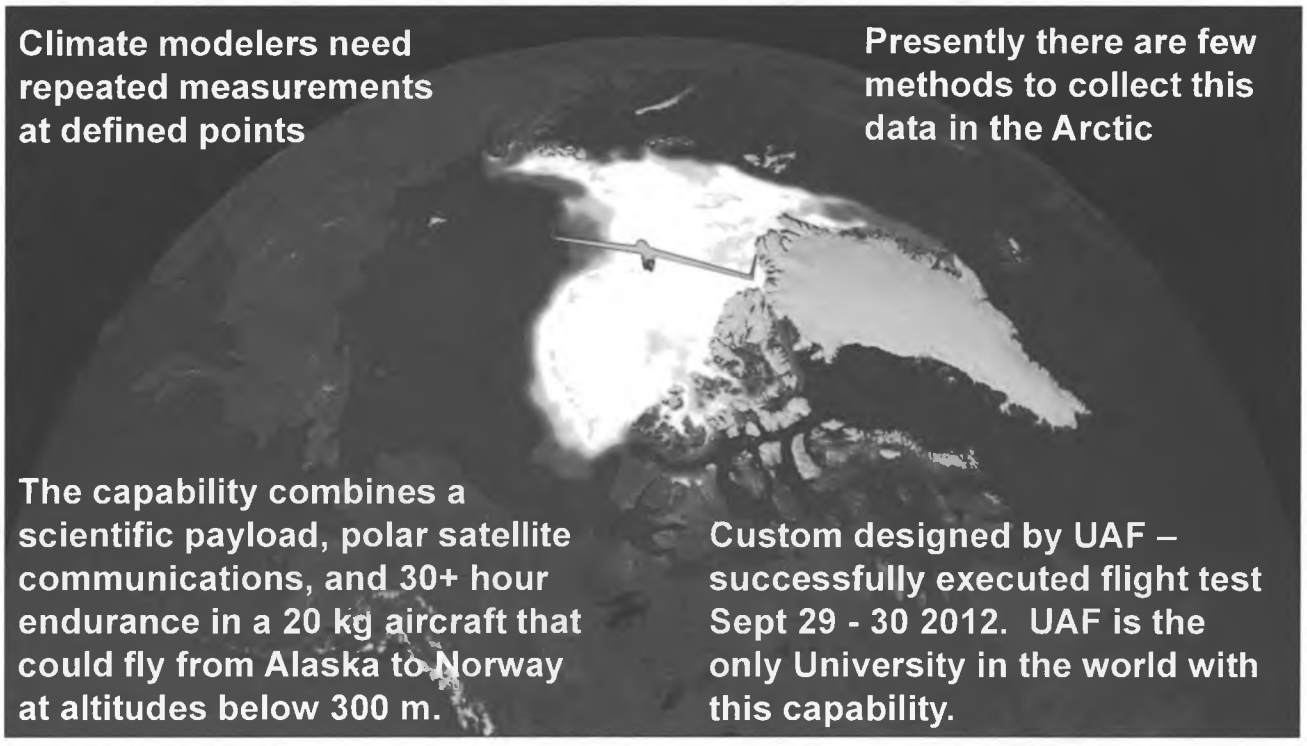
Oil Spill Response Exercise - Columbia River Estuary



- 11-13 March 2013
- Puma AE Operation

Low-altitude, over-the-pole capability

Fuel-injected, Iridium-communication-enhanced, long-endurance, small unmanned aircraft



Volcanic Ash Analysis and Detection
USAF Small Business Innovative Research

- Collaboration between UAF researchers and new industry
- Opportunity to launch a business to capitalize on USAF funding with UAF Intellectual Property

FAA Test Site

- Jan 2012: FAA Reauthorization Act directed FAA to select 6 Test Sites to research and test for safe integration of UAS into the national airspace
- Feb 14 2013: Solicitation was released
- UAF leads team for states of Alaska, Oregon, and Hawaii, plus 56 additional team members
  - Includes state agencies (DOT, DPS, Forestry of DNR, DHS&EM, National Guard
  - Universities, EDCs, corporations
- Proposals due multiple dates, last by May 6
- Selection targeted by FAA for Dec 31 2013

Pan Pacific UAS Test Range Complex

- University ACUASI is lead
- Fourteen specific spots around the three states
  - Strong link with military JPARC ranges
  - Forging links with manned aviation safety specialist
- Key questions to answer:
  - Procedures to protect manned aviation
  - Policies to protect privacy
  - Technical testing to assure control, see & avoid, lost link procedures work, etc

How is Privacy Protected?

- **We're dedicated to protect privacy so beneficial uses can be obtained**
- **Current statutory/case law strongly protects privacy while defining legal airborne activities (manned)**
  - **Unmanned a new technology, but subject to same restrictions**
  - **DHS & National Institute for Justice have taken on task of defining specific UAS privacy rules**
  - **FAA committed to incorporating into Test Site and future rules once developed**
  - **DoD & Guard training on domestic privacy well underway**

More on Privacy

- International Chiefs of Police issued guidelines for law enforcement use of UAS
  - Handout with full text available
  - The essence:
    - Follow FAA rules
    - Use strict supervisory accountability
    - Get warrants if any possibility of use for surveillance or investigation
    - Notify locals of intent to fly over them
    - Delete recordings not authorized by warrant, training use, or as required by law
- UAF working with DPS to assist with program, procedures, all to be set up before first flight

What about Weapons on UAS?

- Despite media scares, this won't happen
- The Unmanned Aircraft System community uniformly against any such use
- Small UAS incapable of carrying weapons
  - But even if they could…
- FAA prohibits weapons completely—or any dropping of objects from aircraft
- IACP advises against even considering—sees as unlikely technologically, unacceptable to public, ineffective use of UAS

HR No 6

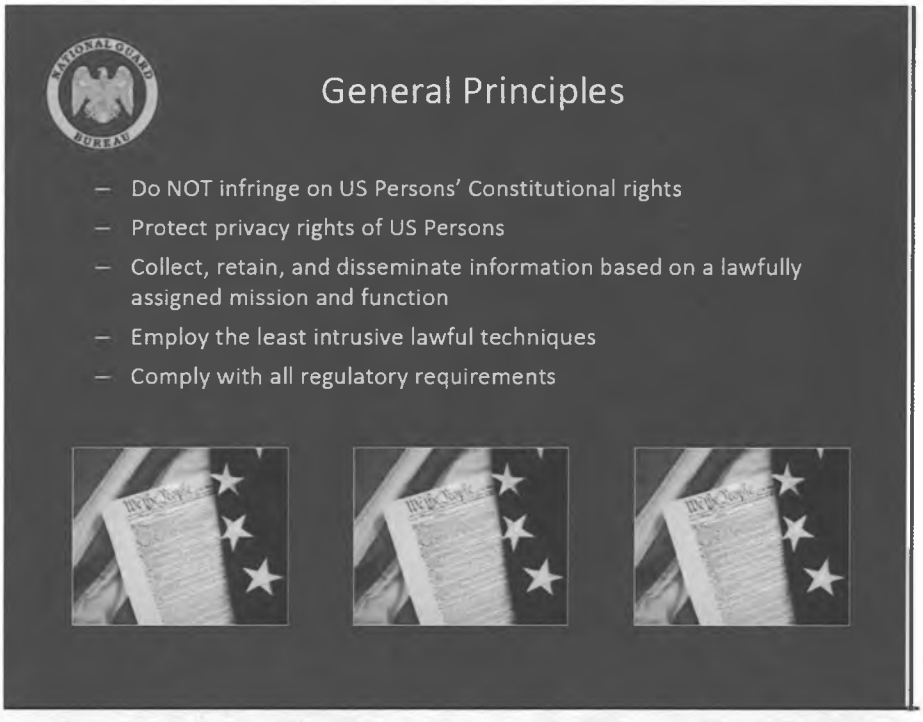
- Thank you for a thoughtful and balanced view of the potential benefits and risks of UAS
- Recognition of UAF's work to date is gratifying—our goal always has been to benefit Alaska
  - You've seen many benefits already, but potential remains far greater
  - Military users & media treatment have created an impression of danger for domestic use
  - No violations yet; we pledge to work hard both on the task force and in the test site to craft solid, defensible policy for your consideration

2012 Alaska Legislature Capital Budget

Research and Development of Unmanned Aerial Systems	5,000,000	5,000,000

16 (HD 1-40)
It is the intent of the Legislature that the University of Alaska collaborate with the Federal Aviation Administration in establishing a research and development program and possible test facility for Unmanned Aerial Systems in Alaska. Unmanned Aerial Systems are already being utilized in Alaska in many ways and as the Arctic race progresses, they will become even more vital as a resource to the State and the Country.

Excerpt From DoD Training Briefing



Unmanned Aircraft System Operations
Industry "Code of Conduct"

The emergence of unmanned aircraft systems (UAS) as a resource for a wide variety of public and private applications quite possibly represents one of the most significant advancements to aviation, the scientific community, and public service since the beginning of flight. Rapid advancements in the technology have presented unique challenges and opportunities to the growing UAS industry and to those who support it. The nature of UAS and the environments which they operate, when not managed properly, can and will create issues that need to be addressed. The future of UAS will be linked to the responsible and safe use of these systems. Our industry has an obligation to conduct our operations in a safe manner that minimizes risk and instills confidence in our systems.

For this reason, the Association for Unmanned Vehicle Systems International (AUVSI), offers this Code of Conduct on behalf of the UAS industry for UAS operation. This code is intended to provide our members, and those who design, test, and operate UAS for public and civil use, a set of guidelines and recommendations for safe, non-intrusive operations. Acceptance and adherence to this code will contribute to safety and professionalism and will accelerate public confidence in these systems.

The code is built on three specific themes: Safety, Professionalism, and Respect. Each theme and its associated recommendations represent a "common sense" approach to UAS operations and address many of the concerns expressed by the public and regulators. This code is meant to provide UAS industry manufacturers and users a convenient checklist for operations and a means to demonstrate their obligation to supporting the growth of our industry in a safe and responsible manner. By adopting this Code, UAS industry manufacturers and users commit to the following:

Safety

- We will not operate UAS in a manner that presents undue risk to persons or property on the surface or in the air.
- We will ensure UAS will be piloted by individuals who are properly trained and competent to operate the vehicle or its systems.
- We will ensure UAS flights will be conducted only after a thorough assessment of risks associated with the activity. This risks assessment will include, but is not limited to:
- Weather conditions relative to the performance capability of the system
- Identification of normally anticipated failure modes (lost link, power plant failures, loss of control, etc) and consequences of the failures
- Crew fitness for flight operations
- Overlying airspace, compliance with aviation regulations as appropriate to the operation, and off-nominal procedures
- Communication, command, control, and payload frequency spectrum requirements
- Reliability, performance, and airworthiness to established standards

Professionalism

- We will comply with all federal, state, and local laws, ordinances, covenants, and restrictions as they relate to UAS operations.
- We will operate our systems as responsible members of the aviation community.
- We will be responsive to the needs of the public.
- We will cooperate fully with federal, state, and local authorities in response to emergency deployments, mishap investigations, and media relations.
- We will establish contingency plans for all anticipated off-nominal events and share them openly with all appropriate authorities.

Respect

- We will respect the rights of other users of the airspace.
- We will respect the privacy of individuals.
- We will respect the concerns of the public as they relate to unmanned aircraft operations.
- We will support improving public awareness and education on the operation of UAS.

As an industry, it is incumbent upon us to hold ourselves and each other to a high professional and ethical standard. As with any revolutionary technology, there will be mishaps and abuses; however, in order to operate safely and gain public acceptance and trust, we should all act in accordance with these guiding themes and do so in an open and transparent manner. We hope the entire UAS industry will join AUVSI in

adopting this industry Code of Conduct.

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Recommended Guidelines for the use of Unmanned Aircraft

BACKGROUND:

Rapid advances in technology have led to the development and increased use of unmanned aircraft. That technology is now making its way into the hands of law enforcement officers nationwide.

We also live in a culture that is extremely sensitive to the idea of preventing unnecessary government intrusion into any facet of our lives. Personal rights are cherished and legally protected by the Constitution. Despite their proven effectiveness, concerns about privacy threaten to overshadow the benefits this technology promises to bring to public safety. From enhanced officer safety by exposing unseen dangers, to finding those most vulnerable who may have wandered away from their caregivers, the potential benefits are irrefutable. However, privacy concerns are an issue that must be dealt with effectively if a law enforcement agency expects the public to support the use of UA by their police.

The Aviation Committee has been involved in the development of unmanned aircraft policy and regulations for several years. The Committee recommends the following guidelines for use by any law enforcement agency contemplating the use of unmanned aircraft.

DEFINITIONS:

1. **Model Aircraft** - A remote controlled aircraft used by hobbyists, which is manufactured and operated for the purposes of sport, recreation and/or competition.
2. **Unmanned Aircraft (UA)** – An aircraft that is intended to navigate in the air without an on-board pilot. Also called Remote Piloted Aircraft and "drones."
3. **UA Flight Crewmember** - A pilot, visual observer, payload operator or other person assigned duties for a UA for the purpose of flight.
4. **Unmanned Aircraft Pilot** - A person exercising control over an unmanned aircraft during flight.

COMMUNITY ENGAGEMENT:

1. Law enforcement agencies desiring to use UA should first determine how they will use this technology, including the costs and benefits to be gained.
2. The agency should then engage their community early in the planning process, including their governing body and civil liberties advocates.
3. The agency should assure the community that it values the protections provided citizens by the U.S. Constitution. Further, that the agency will operate the aircraft in full compliance with the mandates of the Constitution, federal, state and local law governing search and seizure.
4. The community should be provided an opportunity to review and comment on agency procedures as they are being drafted. Where appropriate, recommendations should be considered for adoption in the policy.
5. As with the community, the news media should be brought into the process early in its development.

SYSTEM REQUIREMENTS:

1. The UA should have the ability to capture flight time by individual flight and cumulative over a period of time. The ability to reset the flight time counter should be restricted to a supervisor or administrator.
2. The aircraft itself should be painted in a high visibility paint scheme. This will facilitate line of sight control by the aircraft pilot and allow persons on the ground to monitor the location of the aircraft. This recommendation recognizes that in some cases where officer safety is a concern, such as high risk warrant service, high visibility may not be optimal. However, most situations of this type are conducted covertly and at night. Further, given the ability to observe a large area from an aerial vantage point, it may not be necessary to fly the aircraft directly over the target location.
3. Equipping the aircraft with weapons of any type is strongly discouraged. Given the current state of the technology, the ability to effectively deploy weapons from a small UA is doubtful. Further, public acceptance of airborne use of force is likewise doubtful and could result in unnecessary community resistance to the program.
4. The use of model aircraft, modified with cameras, or other sensors, is discouraged due to concerns over reliability and safety.

OPERATIONAL PROCEDURES:

1. UA operations require a Certificate of Authorization (COA) from the Federal Aviation Administration (FAA). A law enforcement agency contemplating the use of UA should contact the FAA early in the planning process to determine the requirements for obtaining a COA.
2. UA will only be operated by personnel, both pilots and crew members, who have been trained and certified in the operation of the system. All agency personnel with UA responsibilities, including command officers, will be provided training in the policies and procedures governing their use.
3. All flights will be approved by a supervisor and must be for a legitimate public safety mission, training, or demonstration purposes.
4. All flights will be documented on a form designed for that purpose and all flight time shall be accounted for on the form. The reason for the flight and name of the supervisor approving will also be documented.
5. An authorized supervisor/administrator will audit flight documentation at regular intervals. The results of the audit will be documented. Any changes to the flight time counter will be documented.
6. Unauthorized use of a UA will result in strict accountability.
7. Except for those instances where officer safety could be jeopardized, the agency should consider using a "Reverse 911" telephone system to alert those living and working in the vicinity of aircraft operations (if such a system is available). If such a system is not available, the use of patrol car public address systems should be considered. This will not only provide a level of safety should the aircraft make an uncontrolled landing, but citizens may also be able to assist with the incident.
8. Where there are specific and articulable grounds to believe that the UA will collect evidence of criminal wrongdoing and if the UA will intrude upon reasonable expectations of privacy, the agency will secure a search warrant prior to conducting the flight.

IMAGE RETENTION:

1. Unless required as evidence of a crime, as part of an on-going investigation, for training, or required by law, images captured by a UA should not be retained by the agency.
2. Unless exempt by law, retained images should be open for public inspection.