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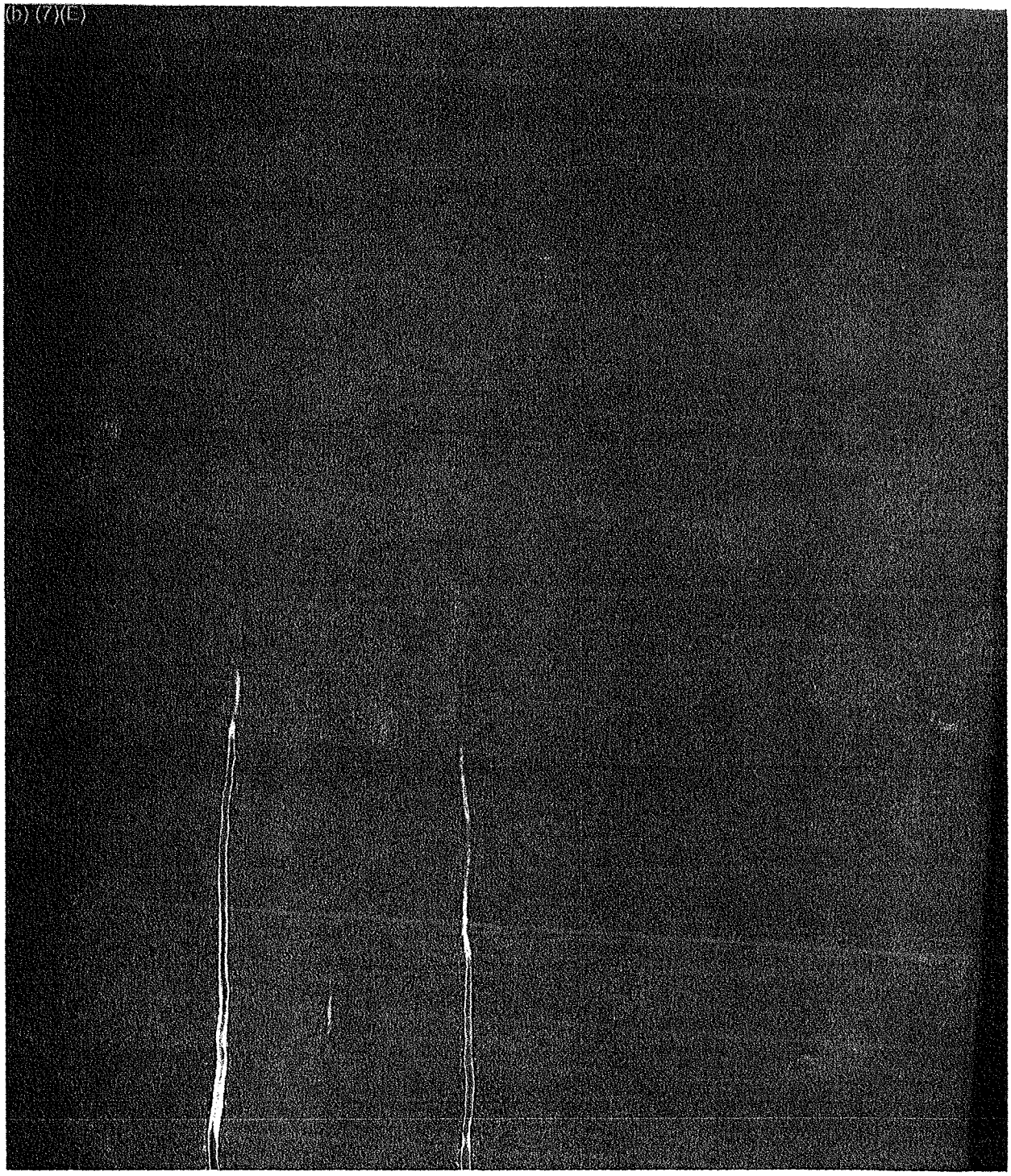

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The OAM UAS will address, in part, these HLS/MHLS mission gaps, and should be a force multiplier for CBP, DHS, and interagency commanders. Its persistent, (b) (7)(E) capabilities (b) (7)(E)

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will enable the HLS/MHLS/SBI FoS to more effectively support the Nation's HLS, MHLS, and law enforcement requirements.

B. Targets of Interest

Projected UAS TOIs include numerous types of conveyances that may be used to smuggle terrorists, undocumented migrants or contraband, day and night, in clear and adverse weather, across our Nation's borders. These TOIs include:

- Land Border Domain:

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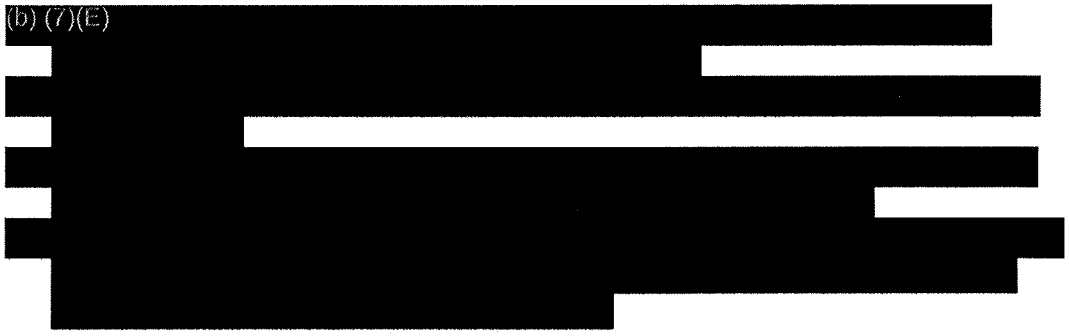

- Maritime Domain:

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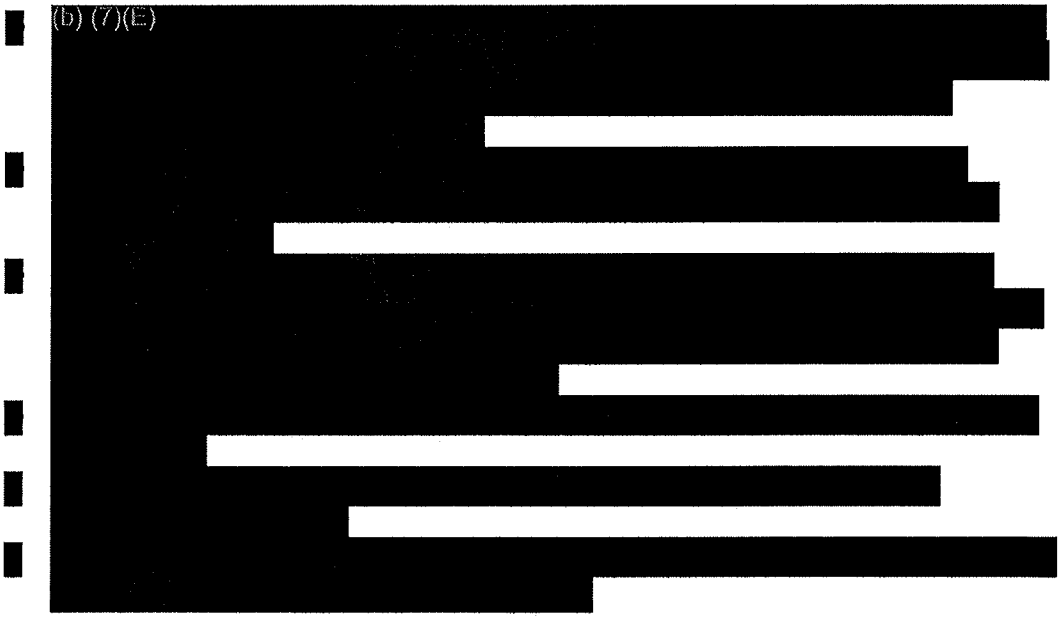

Any of these TOIs, especially the smaller conveyances, may be operating in an electronically silent mode and/or employing evasive or deceptive tactics such as signature reduction, camouflage, concealment, and/or deception (CCD) techniques, decoy partners, or false electronic identification.

C. Mission Tasks

As described in Section 3.3.1, the OAM UAS will use an RSTA mission construct and will perform or support mission essential surveillance, detection, classification, identification, and prosecution (SDCIP) tasks. Descriptions of these mission tasks follow:

1. Surveillance:

   Surveillance is the employment of sensors (active and/or passive) to survey an area and to build/maintain domain SA. Dependent upon mission objectives and operating conditions, the UAS will operate at various altitudes/airspeeds and will employ various search profiles/techniques. Generation of onboard sensor data and fusion with off-board data will be essential in establishing and maintaining SA/MDA of the assigned OPAREA.

2. Detection:

   Probability of detection during a surveillance activity depends upon the capabilities of the UAS's sensors, the operating conditions, and the characteristics of the TOI. It is essential that the UAS provide capabilities to detect a wide range of TOIs, under ideal and adverse conditions, including small, low-profile TOIs, such as human "mules" on the ground, "go-fast" boats, and SPSSs.

3. Classification:

   Classification is the determination of the specific group or category to which a TOI belongs, such as a fishing vessel, merchant vessel, naval vessel, etc. The determination of the current activity of a target (e.g., a vessel dead in the water, fishing, smuggling contraband/undocumented aliens, discharging oil or hazardous substances, etc.) is also an element of this function. The classification task can be divided into initial and active classification.

   Initial classification categorizes detections on the basis of parameters such as target size, course/speed, location, and other attributes. Initial classification will usually be accomplished without diverting from the patrol search pattern and is maintained as part of the local operational picture. Active classification involves the categorization of those targets that meet the general characteristics of the mission TOI.

   Performing classification tasks may involve directing the UA to close the distance or viewing angle to the TOI. Active classifications are reported as required to support the overall operational picture and to coordinate positioning of patrolling air or surface assets.

Depending on transit distance to the OPAREA, desired time-on-station, airspace access, environmental conditions, and other factors, the UAS may transit to/from its OPAREA at altitudes that differ from is tactical operating altitude. Once in its OPAREA, it will seek to maximize sensor performance for the particular SDCIP task to be performed and the sensor(s) capabilities required to support that task. As an example, some maritime modes (e.g., Search and ISAR) require diametrically opposed flight profiles. Sea Search modes are best employed at higher altitudes to maximize the area of surveillance, but altitude increases the radar's backscatter from the sea surface, which compromises ISAR mode performance. ISAR is optimized at lower altitudes to avoid this backscatter. Optimizing the UA platform's multiple sensors for the mission task is a dominant consideration in defining mission profiles.

E. Ground Rules and Assumptions

In order to develop comprehensive CONOPS that will serve as the foundation for DHS's investment leading to effective and suitable capabilities, ground rules, and assumptions have been made. These ground rules and assumptions reiterate OAM UAS management guidelines, serve to provide operational context clarification, specify the conditions under which requirements may be developed, and consider partner agency requirements. OAM's UAS program ground rules and assumptions are summarized in Table 5.

Table 2. UAS Ground Rules & Assumptions.

No.	Ground Rule/Assumption
1	The UAS host platform for OAM UAS Increments I and II will be the GA-ASI Predator B, Model MQ-9CBP.
2	The UA, GCS, flight control data links and other flight- or safety-critical UAS elements will attain all necessary CBP certifications for flight operations.
4	UAS pilots, sensor operators, and maintainers will be trained and qualified to standards set forth by OAM, USCG, and/or other intra-/interagency agreements.
5	The UAS will have Continental United States (CONUS) support for maintenance, training, testing, and depot level support. The AMOC, OAM UAS OCs, and OGA facilities will house primary unit personnel and equipment.
6	Baseline documents for OAM UAS flight operations will include General Operating and Flight Rules (Part 91), including FAA exemptions to OAM and the USCG, the OAM Aviation Operations Handbook (AOH), and USCG Instruction 3710.1 (COMDTINST M3710.1 Series).

c. Mission Datalinks

Mission datalinks will provide LOS and BLOS communications and control channels with sufficient bandwidth, reliability, and availability to transmit and to receive mission essential information exchanges, including, but not limited to, telecommand uplink to transmit UA and payload control data and telemetry downlink to receive UA health and status, navigation, and payload data.

d. Mission Sensors

The UAS sensor suite will provide the capability to perform search, detection, and classification of TOIs day and night, moving and stationary, located on land, at sea, or in a mooring field/port/harbor, un-obscured or partially obscured by atmospheric conditions, and radar reflective or non-radar reflective. Capability against TOIs obscured by terrain, vegetation, CCD measures, or adverse atmospheric phenomena is highly desired.

Passive sensors will include, at a minimum, a modern EO/IR day/night sensor capable of operation in the visible and portions of the IR spectrum and an AIS receiver. Passive sensors will produce high-resolution wide and narrow-field-of-view video, within required National Imagery Interpretability Rating Scale (NIIRS) levels, including color video from the EO sensor. Other passive sensors, such as passive RF sensors which provide electronic support measures (ESM) capability, may be considered for inclusion if suitable and if a significant benefit to mission effectiveness can be demonstrated.

Active sensors will include a multi-mode radar, a laser rangefinder and an IR illuminator. For the Increment I Baseline UAS, the radar will be the Lynx SAR system. The Increment II Maritime UAS will use the Raytheon SeaVue multi-mode radar with the NAVSEA OSI enhancement. These radars, along with their added target processing capabilities, will provide mode agility, scan agility, frequency agility, range agility, high resolution imaging, operator interface, and sensor integration attributes.

The Maritime UAS SeaVue/NAVSEA OSI radar will include long- and short-range search and track, small radar cross section target detection, maritime moving target indication (MMTI), SAR for strip and spot SAR imaging, and ISAR for ship imaging and range profiling. Returns from the AIS receiver will be integrated and fused onto the radar display through the NAVSEA OSI processor.

The radar will be the backbone of the UAS sensor suite because it will provide broad area surveillance, detection, and tracking of multiple TOIs. This initial activity will

build the "picture," or plot in the UA's area, and target data will be available for cueing high-resolution radar modes and/or EO/IR sensors, for target classification. SAR sensors will provide capability during periods of adverse weather when EO/IR sensors may be degraded because of cloud cover or atmospheric conditions.

e. Communications Navigation Surveillance/Air Traffic Management

The UAS will include baseline Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) capabilities that will enable access to planned OPAREAs, including the NAS, international, and potentially foreign airspace. OAM's Strategic Plan calls for OAM operations throughout the northwest world hemisphere necessitating extended airspace access. This access mandates compliance with CNS/ATM rules and regulations.[16]

The UAS will be able to communicate with all domestic and international ATS providers appropriate for its designated OPAREA and this CONOPS. The UAS will also be able to communicate with other aircraft (i.e., "participate within the talk group," similar to manned aircraft, as well as other mission-essential operations facilities).

The UAS will include robust and redundant navigation capabilities that can meet all mission requirements. Navigation mission requirements include, but are not necessarily limited to:

- UA air navigation capabilities required to comply with airspace regulatory authority requirements for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) flight in the NAS, international (including due regard), and foreign airspace
- Navigation sufficient to support sensor operations, including bore sighting, sensor search and track operations, sensor slaving, cueing, and high-resolution radar imaging
- Navigation capability sufficient to provide sensor target data, sensor target location error, and target geodetic requirements, including target data accuracy requirements necessary to meet law enforcement prosecution standards
- Navigation sufficient to provide sensor and/or target metadata useful to off-board operations facilities, including C2 sites, processing, exploitation, and dissemination sites and "end-game" interdiction/ prosecution assets.

[16] Northwest world hemisphere is defined as the Equator to 90 degrees north latitude, Prime Meridian to 180 degrees west longitude.

B. Southwest Border Region

The Southwest Border Region (Figure 4) extends nearly 2,000 statute miles along the southern borders of California, Arizona, New Mexico, and Texas. In most areas, the border is located in remote, sparsely populated regions of desert and rugged mountainous terrain. Its vast length and varied topography pose significant challenges to CBP's efforts to control the entry of individuals and goods between U.S. ports of entry.

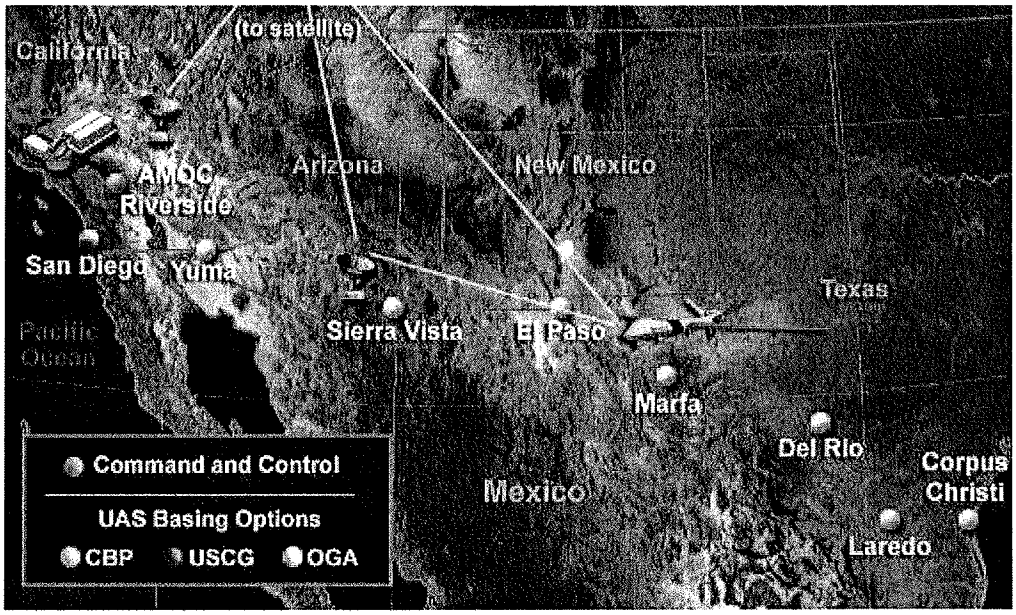

Figure 4. Southwest Border Region

The Southwest Border Region is the most significant storage, transportation and trans-shipment area for illicit drug shipments destined for the U.S. drug market. It is the principal arrival zone for most drugs smuggled into the United States and more illicit drugs are seized along the southwest border than in any other arrival zone. Mexican Drug Trafficking Organizations (DTOs) have developed sophisticated and expansive drug transportation networks extending from the Southwest Border Region to all areas of the United States. They smuggle large quantities of illicit drugs through and between ports of entry and store them in communities throughout the region. Most of the region's principal metropolitan areas, including Dallas, El Paso, San Antonio, and Houston, Texas; Phoenix, Arizona; and San Diego and Los Angeles, California, are significant storage locations as well as regional and national transportation and distribution centers. DTOs and criminal groups transport drug shipments from these locations to destinations throughout the country. The threat posed to the Nation by DTOs that operate in Mexico and within the Southwest Border Region extends well beyond drug trafficking to other criminal activities, including border violence, firearms trafficking, money laundering, and undocumented migrant smuggling.

Southwest Border Region basing options include:

- DHS:
  - CBP Air and Marine Locations: Sierra Vista, Tucson, and Yuma, Arizona; El Paso, Marfa, Corpus Christi, Laredo, and Del Rio Texas; San Diego, California
  - USCG Air Station: San Diego, California.

Southwest Border Region operational challenges include:

- Environmental factors:
  - Extremely hot summer temperatures and dry, arid climate

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- (b) (7)(E) [redacted]

C. Northern Border Region

The Northern Border Region extends approximately 3,000 statute miles from the Pacific Ocean to the Atlantic Ocean. OAM UAS operations in the Northern Border Region are broken into four geographical areas:

- Pacific Northwest
- Great Plains
- Great Lakes/Saint Lawrence Seaway
- Northeastern Border

The topography along the U.S. Northern border varies greatly. The Pacific Northwest Region is wooded and mountainous, but also contains numerous urban centers. The Great Plains Region is desolate, dry, and windy. The Northeastern Border Region is highly agricultural with low hills and significant vegetation. Whereas most illegal traffic comes across the U.S. Southwest border on foot, Northern Border Region illegal trafficking typically occurs via light airplane, helicopter, private vehicles or boats, ATVs, and/or snowmobiles.

CBP performs on-going spectrum coordination with the National Telecommunications and Information Administration (NTIA) to ensure spectrum is available so that UAS systems may operate and support CBP operations.

In summary, the Northern Border Region presents varied and demanding operational challenges to CBP, and in turn on the UAS program in the Region. Specific Northern Border Region operational challenges include:

- Environmental factors:
  - (b) (7)(E) extreme winter cold (b) (7)(E)
  - Cloud layers and icing (b) (7)(E)
  - (b) (7)(E)
  - Significant surface winds (b) (7)(E)
- (b) (7)(E)

1. Pacific Northwest

The Pacific Northwest OPAREA (Figure 5) presents a challenging law enforcement environment. Many attempt to enter the United States or Canada illegally (b) (7)(E) [redacted] This region includes densely populated urban areas, including Seattle, Washington, and Vancouver, Canada.

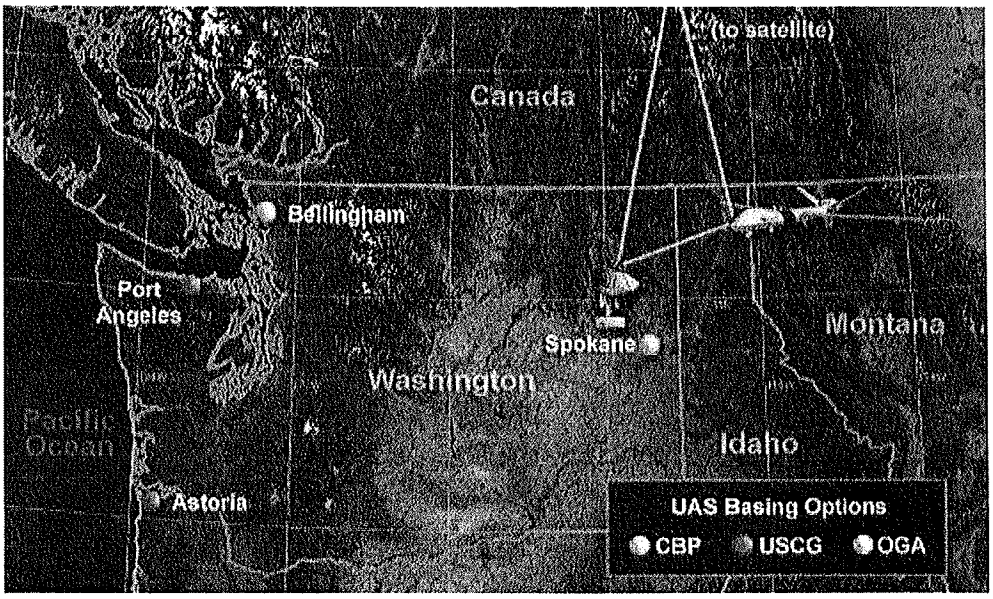


Figure 5. Pacific Northwest OPAREA

The Pacific Northwest presents extremes in topography, which include maritime (Puget Sound), mountainous (Cascade and Rocky Mountains) and heavily wooded river valleys. Climate varies from wet and cold to dry and barren. (b) (7)(E) [redacted]

1 (b) (7)(E) [redacted]

Pacific Northwest basing options include:

- DHS:
  - CBP Air and Marine Branches in Bellingham and Spokane, Washington
  - USCG Air Station Astoria, Oregon

Pacific Northwest operational challenges include:

- Environmental effects:
  - Extreme turbulence in mountainous terrain
  - IMC 280+ days/year west of the Cascade Mountains
  - Frequent icing at operational altitudes (e.g., FLs 180-220)
- Typical TOIs:
  - Small aircraft/helicopters/float planes, combined with limited FAA radar coverage below 7000 feet above ground level (AGL) in many areas
  - Commercial traffic (land- and water-based)
  - ATVs and snowmobiles
  - Canoes, kayaks, etc.

2 • (b) (7)(E) [redacted]

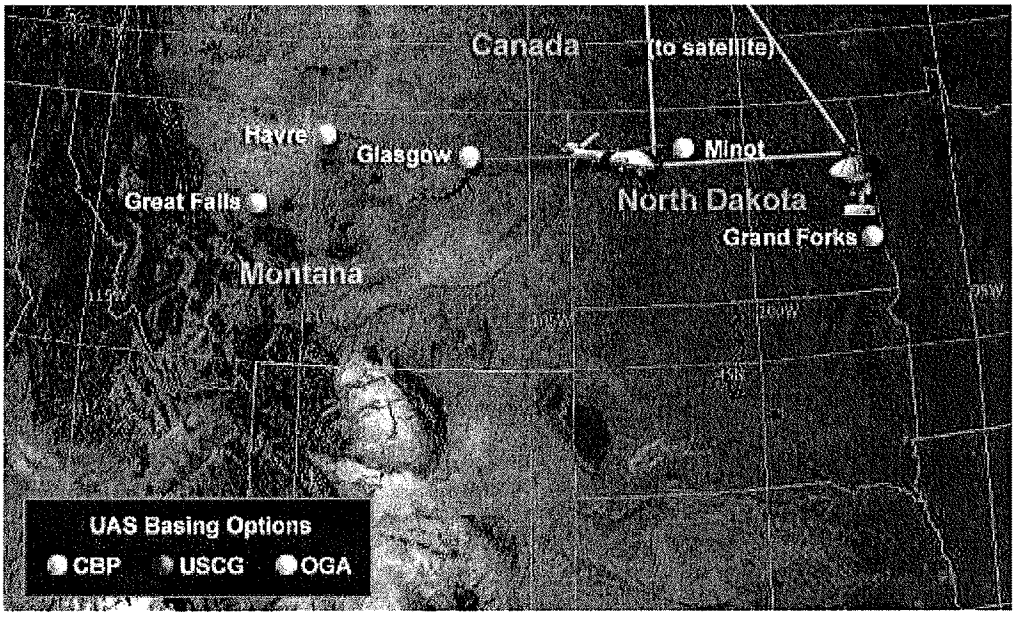
2. Great Plains

The Great Plains OPAREA (Figure 6) lies between the Pacific Northwest and the Great Lakes. This OPAREA is characterized by more than 1,000 statute miles of relatively flat terrain with some rolling hills and numerous lakes and rivers that traverse the U.S.-Canada border. There are no major urban areas/ports of entry. Highway border crossings are generally 50–100 statute miles apart, and the predominant illegal border activity is drug smuggling. Unlike the Pacific Northwest, where the ruggedness of the terrain might provide some natural barrier to illegal border activity, the flatness of the terrain and cross-border waterways are sometimes viewed as making rapid border crossing easier for smugglers and undocumented migrants. Although flat, the region is desolate, and it can be difficult for Border Patrol and Air & Marine operating sites to reach many locations. Under winter conditions, environmental changes (e.g., fresh tracks) may be the best indication of TOI activity, and frozen lakes, rivers, and streams provide potential avenues for contraband smuggling via snowmobiles and vehicles.

Great Plains UAS basing options include:

- DHS:
  - CBP UAS OC-North Dakota
  - CBP Air Branches: Great Falls and Havre, Montana
- OGA:
  - Minot AFB, North Dakota
  - Boeing Glasgow Flight Test Facility (former Glasgow AFB), Montana

Figure 6. Great Plains OPAREA



Great Plains operational challenges include:

- Environmental effects:
  - Winds produce extreme temperature fluctuations; changes of over 100° F within a 24-hour period are possible
- Typical TOIs:
  - Small low-flying aircraft
  - Commercial traffic (land-based)
  - ATVs and snowmobiles
  - Individuals on foot with hand-held GPS units
- Airspace Access:

2 [redacted] (b)(7)(E)

3. Great Lakes/St. Lawrence Seaway

The GL/SLS system (Figure 7) is a deep draft waterway extending 2,340 miles from the Atlantic Ocean to the westernmost Great Lakes. Composed of the St. Lawrence River, St. Lawrence Seaway, and the Great Lakes, this maritime "highway" is adjacent to major U.S. and Canadian industrial, agricultural, and commercial centers. As such, this predominantly maritime border is a significant law enforcement challenge for countering illicit trafficking operations, primarily drug smuggling. The typical TOI in this OPAREA is a contraband vessel amid legitimate commercial vessels and pleasure boaters. This challenge is significant as the Detroit River region boasts one of the highest percentages of registered boat users in the country.

The region's population is approximately 100 million, roughly one quarter of the Canada/U.S. combined population. It has six major urban areas/ports of entry (Milwaukee, Chicago, Detroit, Cleveland, Buffalo/Niagara Falls, and Toronto) and numerous smaller ones (Duluth, Sault Sainte Marie, Port Huron/Sarnia, Toledo, Hamilton, Kingston, etc.).

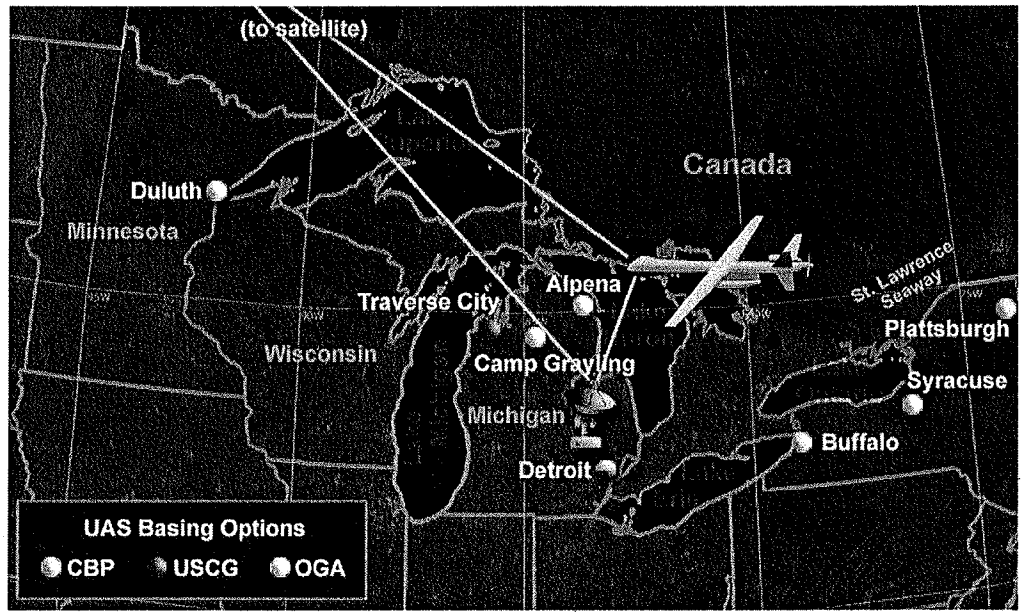


Figure 7. Great Lakes/St. Lawrence Seaway OPAREA.

The GL/SLS system presents an ideal operational environment for the Maritime UAS variant. Maritime UAS missions in this region would include RSTA and wide area surveillance of surface vessels and other conveyances participating in illicit trafficking operations. These missions demand effective multi-mode maritime radar with small target detection, high-resolution imaging (e.g., SAR, ISAR), MMTI, and multi-target tracking capabilities. Because of the high concentration of commercial vessels, the maritime radar must be integrated with an AIS receiver to provide required SA/MDA.

GL/SLS Maritime UAS basing options include:

- DHS:
  - CBP Air and Marine Branches: Detroit, Michigan; Buffalo, New York
  - USCG Air Stations: Traverse City and Detroit, Michigan
- OGA:
  - Camp Grayling Army and Air National Guard Training Center, Michigan
  - Alpena Combat Readiness Training Center, Michigan

GL/SLS operational challenges include:

- Environmental effects:
  - Rapidly changing weather along land-water boundary (i.e., the "lake effect")
  - Portions of the GL/SLS freeze from January to April
- Targets of Interest:
  - High performance/pleasure boats
  - Small aircraft
  - Snowmobiles
  - ATVs
  - Commercial traffic (land- and water-based)

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4. Northeastern Border

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The Northeastern Border OPAREA has no major urban areas/ports of entry, although Montreal, Quebec, is only 50 miles north of the border and 100 miles from Burlington, Vermont. The predominant illegal border activity is drug smuggling, and typical TOIs included highway vehicles and boats.

Northeastern Border OPAREA basing options include:

- DHS:
  - CBP Air Branch Plattsburgh, New York
  - CBP Air and Marine Branches: Buffalo, New York; Houlton, Maine
- OGA:
  - U.S. Army Fort Drum, New York
  - Hancock Field Air National Guard Base, Syracuse, New York

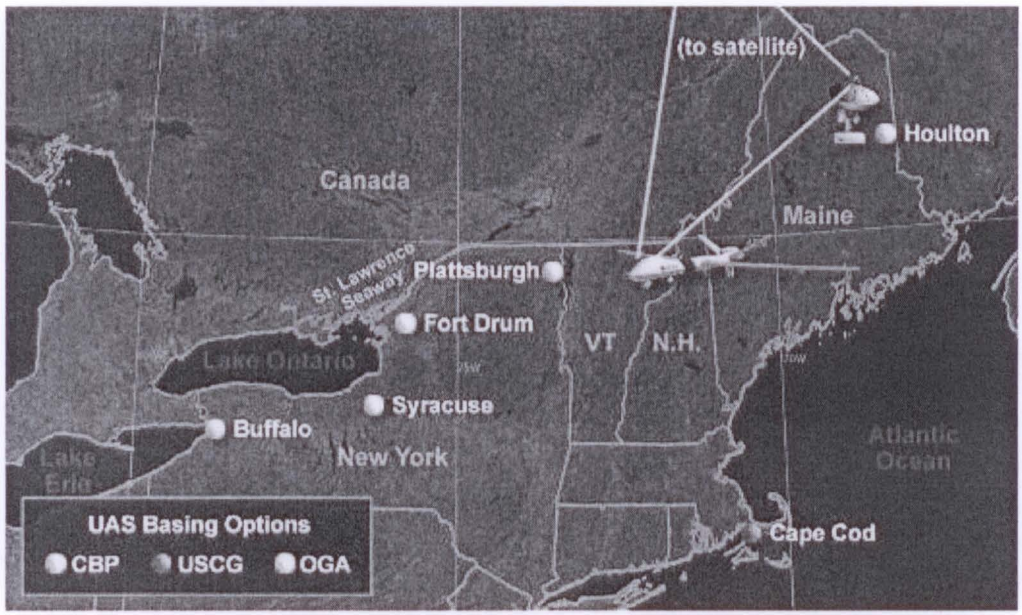

Figure 8. Northeastern Border OPAREA.

Northeastern Border OPAREA operational challenges include:

- Environmental effects:
  - Extreme low temperatures and frequent overcast effects on UA sensor performance

- Targets of Interest:
  - Small aircraft
  - ATVs, snowmobiles, kayaks, and buses
  - Commercial traffic (land- and water-based)
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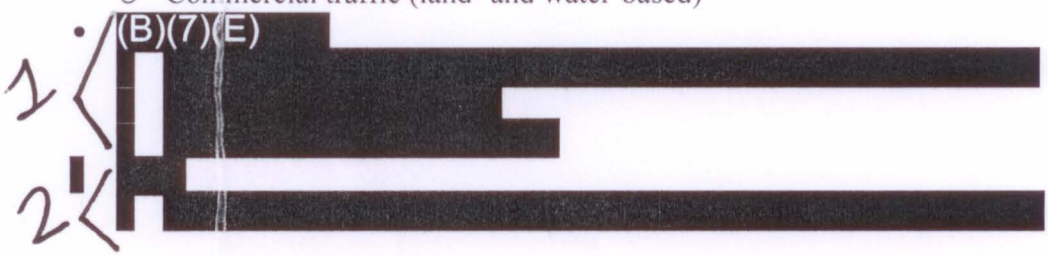

D. Southeast Coastal Border Region

The Southeast Coastal Border Region presents one continuous maritime border; from south Texas east across the Gulf of Mexico, circling south then north through the Straits of Florida

and then north to the mid-Atlantic states. This maritime region is an ideal operational environment for the Maritime UAS variant. Southeast Coastal Border Region UAS operations will be focused in three OPAREAs:

- U.S. Southeastern Coast
- Northern Caribbean
- Transit Zone

Southeast Coastal Border Region operational challenges include:

- Basing:
  - Long transit distances impact available time-on-station
  - FOL coordination with host nation
- Environmental effects:
  - Extreme hot/humid conditions and their effect on UA sensors
  - Frequent thunderstorm/lightning activity
  - UA launch and recovery in low visibility and/or wet runway conditions
- (b) (7)(E) [redacted]

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CBP performs ongoing spectrum coordination with the NTIA to ensure UAS spectrum availability required for CBP unmanned operations.

1. U.S. Southeastern Coast/Northern Caribbean

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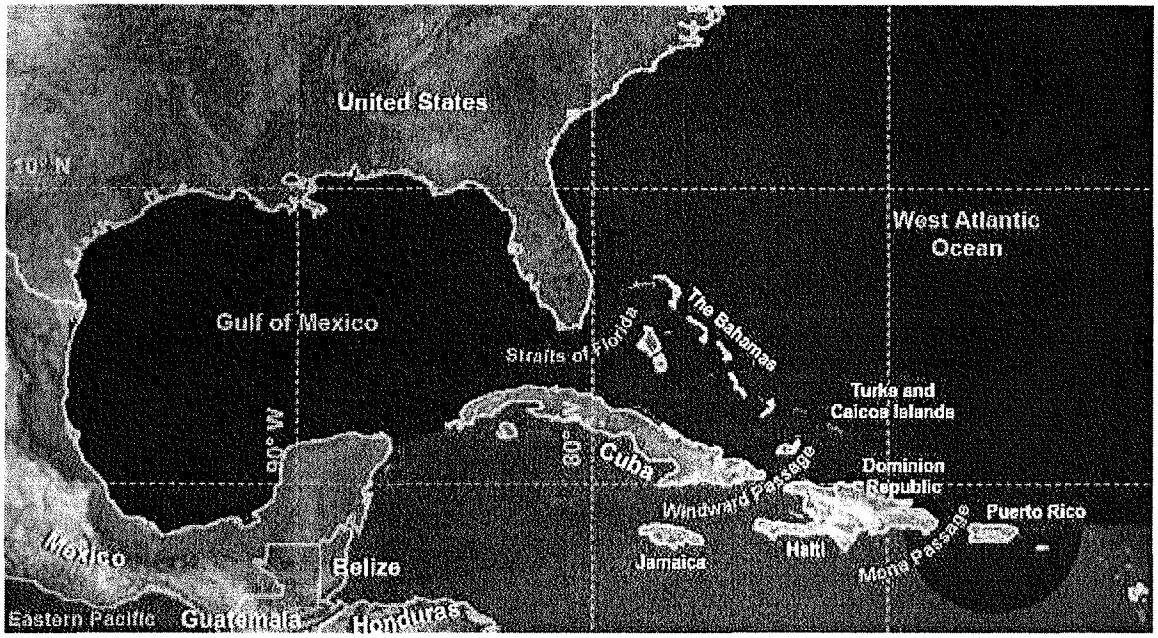
Figure 9. U.S. Southeast Coastal Border Region

Illicit trafficking routes in the Northern Caribbean are always affected by the contraband



movement from/to the Southern Caribbean.

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Historically, maritime movement has been the preferred method of cocaine and heroin trafficking in the Caribbean with go-fast vessel operations dominating drug movement. Recent trends indicate the use of cargo vessels and commercial vessels as mother ships to conduct at sea transfers into smaller faster vessels for onward movement to different transit islands in the Caribbean.

Primary maritime UAS missions in this region would include support to MHLS and interdicting illicit trafficking activity. Secondary missions would include border surveillance and disaster relief in the event of a hurricane or other catastrophic event. Frequent coordination with OGAs and state/local law enforcement activities is anticipated.

U.S. Southeastern Coast/Northern Caribbean Maritime UAS basing options include:

- DHS:
  - CBP Air and Marine Branches: Jacksonville, Tampa and Miami, Florida; New Orleans, Louisiana; Houston, Texas; Aguadilla, Puerto Rico
  - CBP Air Units: Pensacola, Florida
  - P-3 Operations Centers: Corpus Christi, Texas, and Jacksonville, Florida
  - USCG Air Stations: Mobile, Alabama; Savannah, Georgia; Miami and Clearwater, Florida; New Orleans, Louisiana; Borinquen, Puerto Rico
- OGA:
  - Naval Air Stations: Key West, Florida; Guantanamo Bay, Cuba

2. Transit Zone

The open ocean, littoral, and coastal regions of the eastern Pacific, Baja, the east and west coasts of Central America, the southern Caribbean, to the northern shores of South America are collectively known as the Transit Zone (Figure 10).

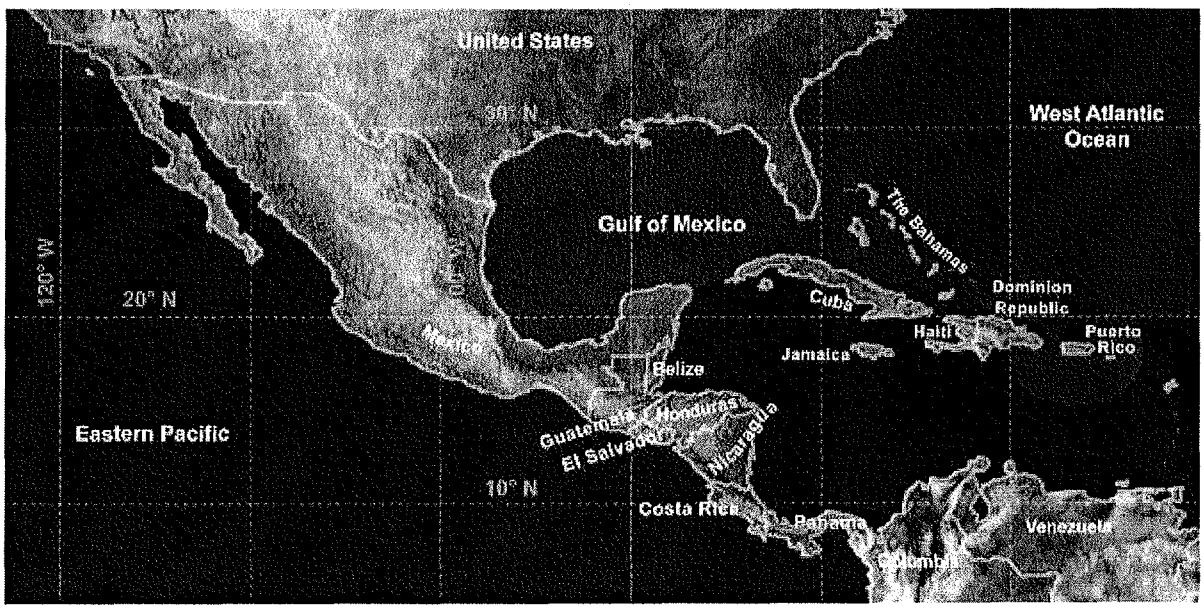

Figure 10. Transit Zones OPAREA[17]

This designation is due to the nature of illegal activities that typically occur in this region; the initial movement, relocation or "transit" of contraband (e.g., drugs, humans, weapons, other materiel) from their initial southern "source" zones to northern restaging points where the terminal leg of the smuggling chain is initiated. Smuggling routes and tactics are constantly changing, moving farther out into open ocean areas and using increasingly sophisticated methods such as SPSS vessels (Figure 11).

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[17] The Transit Zone depicted in dark blue on the map encompasses the Caribbean and Eastern Pacific Oceans.

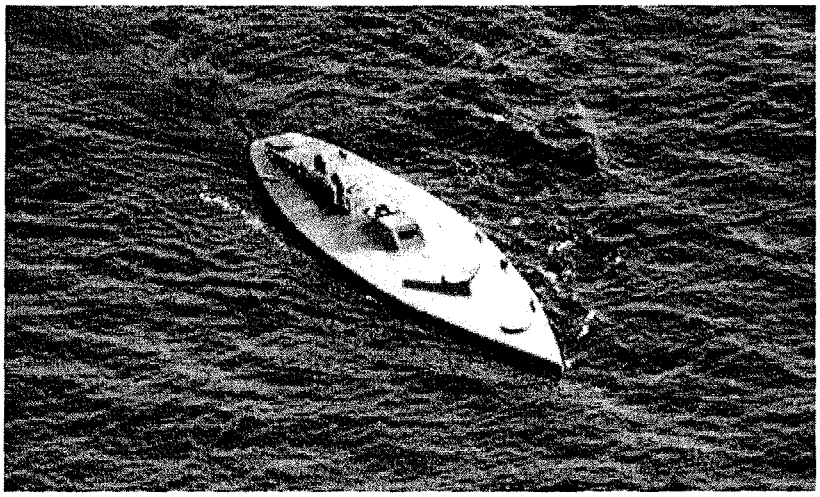

Figure 11. Self-Propelled Semi-Submersible

Transit Zone Maritime UAS basing options and supporting elements include:

- DHS:
  - CBP Air and Marine Branches: Miami, Florida; San Diego, California; Aguadilla, Puerto Rico
  - USCG Air Station Borinquen, Puerto Rico
- OGA:
  - Naval Air Stations: Key West, Florida; Guantanamo Bay, Cuba
  - Host Nation FOLs:
    - Liberia, Costa Rica
    - Managua, Nicaragua
    - Panama City, Panama
    - Comalapa Air Base, El Salvador
    - Piura, Peru

E. Time-Phased CONOPS

This CONOPS illustrates OAM's UAS evolutionary acquisition strategy (Section 2.1.1) through the incremental addition of capabilities to Baseline and Maritime UAS variants. These variants will provide RSTA capabilities targeted to documented gaps (Section 2.3), while addressing key UAS operational challenges (Section 3.4).

1. Near-Term CONOPS

a. Overview

Near-term CONOPS are constrained by existing or rapidly acquired capabilities, currently programmed resources and the existing airspace regulatory environment. Current UAS program plans call for continued operations in the Southwest / Northern Border Regions and in CY 2010 the Guardian maritime UAS will become fully operationalized.

Baseline variant and MVP operations will support the following near-term objectives:

- Southwest Border Region:
  - Expansion of the Southwest Border Region COA further east towards Texas
  - Increased Southwest Border Region operational tempo including increased sorties and two UAs airborne simultaneously
  - Refinement of Southwest Border Region CONOPS and Tactics, Techniques, and Procedures (TTPs)
  - Development of AMOC BLOS C2 CONOPS

- Northern Border Region:
  - Initiation of Baseline UAS operations from Grand Forks AFB, North Dakota, including BLOS operations

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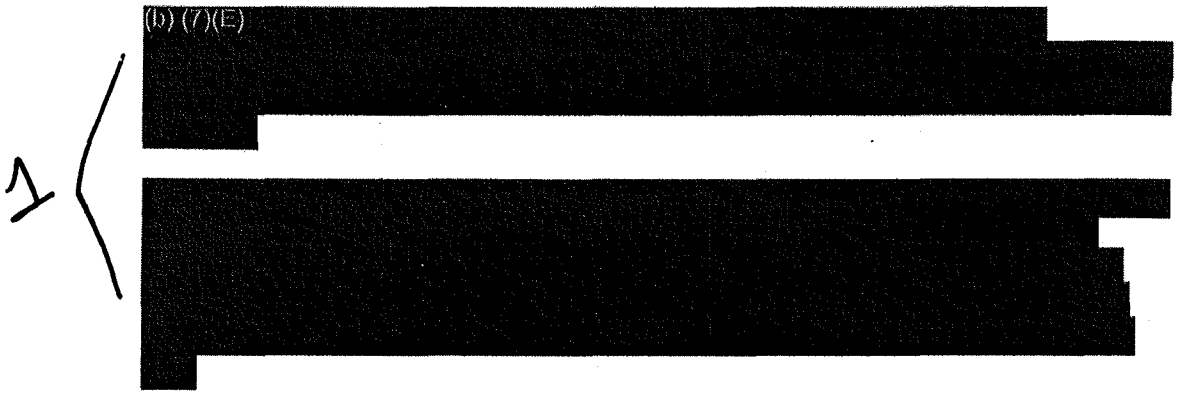
  - C2 from Grand Forks AFB, with transition to AMOC BLOS Ku-band control when feasible
  - Development of Northern Border Region CONOPS and TTPs, including integration with other CBP and Federal, State, local, and tribal assets

- Maritime Variant Prototype:
  - Operate in the U.S. Southeast Coastal Border Region and Extended Border OPAREAs
  - Support Increment II Concept Development and Demonstration Phase by demonstrating Maritime UAS capabilities, systems integration, sensor performance, and interoperability
  - Commence MVP IOT&E

including land border regions, offshore Warning Areas, and FAA Flight Information Regions (FIRs) will be achieved through one or more of the following:

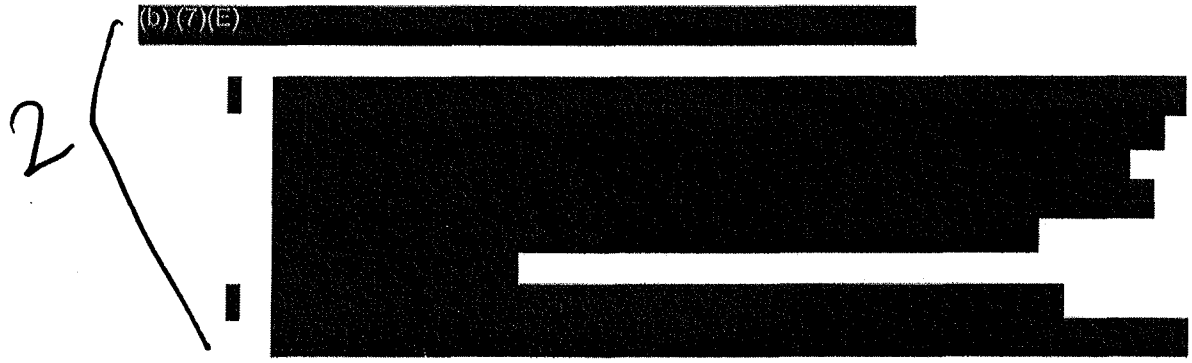
- FAA issued COA
- Use of SUA; Restricted and/or Warning Areas
- Issuance of a Temporary Flight Restriction (TFR) for transition to mission airspace



e. Basing

Basing to support Northern Border Region and southeastern United States/Northern Caribbean operations will be determined from the locations listed in Sections 5 (e.g., the OAM Branch Miami, Florida). Currently, Northern Border Region operations are based at Grand Forks AFB. MVP detachments may occur to other CONUS locations (e.g., the GL/SLS OPAREA) or FOLs in the Transit Zone.

f. Mission Profiles



- (b) (7)(E) [redacted]

In all cases, once the UA is established in its OPAREA (COA defined or offshore in SUA), the UA will establish an RSTA pattern appropriate for the mission assignment and environmental conditions and begin SDCIP mission tasks. Near-term, the local OC will provide both LOS and BLOS C2. When the mission period is complete, the UA will return to base per COA requirements. Near-term CONOPS for a Maritime UAS are illustrated in Figure 12, which follows.

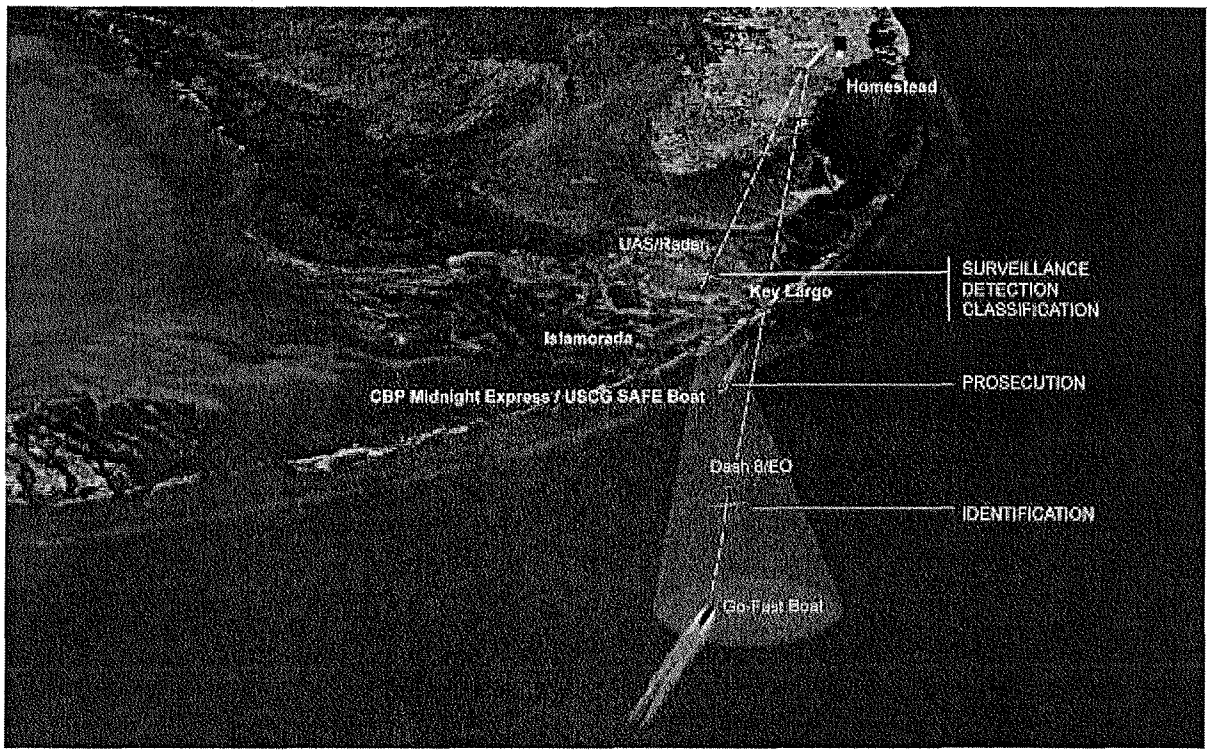


Figure 12. Near-Term Maritime UAS CONOPS Illustration

g. Vignettes

Great Plains

As part of an IBET operation, a commercial vehicle loaded with the drug Ecstasy has been tagged with a covert tracking device and cleared through the port of entry at Pembina, North Dakota, at 0200 local time. Operating at FL190 above a 3,000-foot thick undercast, the UA is tracking the vehicle with its GMTI mode and a pod mounted tracking receiver heading south along Interstate 29. After a short time period, the vehicle exits the Interstate and rendezvous with another vehicle just off State Route 55. Descending below the undercast, the UA sensor operator cues the MTS and observes packages being transferred from one vehicle to the other. During the transfer, the AMOC mission commander requests FAA permission to alter the UA flight plan to follow the receiving vehicle further south until a "wagon train" of surveillance units (e.g., unmarked law enforcement vehicles, manned aircraft, etc.) can be arranged to track the vehicle to its final destination. The UA follows the suspect vehicle south for three hours towards the Twin Cities until relieved by a CBP manned aircraft and then returns to its home base, landing after a 16-hour mission.

2. Mid-Term CONOPS

a. Overview

The mid-term CONOPS period includes the latter four years of the current budget cycle, a period in which resources within the current plan can be reprogrammed to provide increased capability, assets, services, and manpower. Current UAS program plans call for continued Southwest Border Region operations, further expansion of Northern Border Region operations to the Pacific Northwest and northeastern border, and completion of MVP IOT&E.

Baseline variant and MVP operations will support the following mid-term objectives:

- Southwest Border Region:
  - (b) (7)(E)
  - Increased Southwest Border Region Operational Tempo (OPTEMPO), including 24/7 operations, and operations with two UA airborne simultaneously
  - Refinement of Southwest Border Region CONOPS and TTPs
  - Refinement of AMOC BLOS C2 CONOPS, and development of AMOC BLOS TTPs

- Northern Border Region:
  - (b) (7)(E)
  - Refinement of Northern Border Region CONOPS and TTPs
  - Dual UAS operations in selected OPAREAs
  - BLOS C2 from the AMOC.

- Maritime Variant Prototype:
  - Operate in the U.S. Southeastern Coast/Northern Caribbean OPAREA
  - Complete MVP IOT&E
  - Finalize Maritime UAS Operational Requirements
  - Develop Maritime UAS CONOPS and TTPs
  - Contribute to MDA of the U.S Southeastern Coast and littorals
  - Deploy as required to FOLs in the Transit Zone.

Although beyond the scope of this document, Maritime UAS operations has witnessed the introduction of the USCG's National Security Cutter and awaits USCG's feasibility studies for a utilization of a cutter-based UAS into DHS operations. In addition, the U.S. Navy's Broad Area Maritime Surveillance system is scheduled to IOC in 2013. CONOPS and capabilities of these systems may impact Maritime UAS operations, especially relating to airspace access.

b. Payloads

UAS sensors will continue to be refined, as high-resolution imaging, full-motion video (FMV), and payload data transmission requirements are met. This will include the ability to detect and track critical TOIs such as SPSSs, and possibly objects as small as a human in the water. Improved sensor fusion algorithms, as well as Automatic Target Recognition/Automatic Target Classification (ATR/ATC) features will be introduced. Airspace regulatory compliance will drive the introduction and/or activation of UA platform-based "sense and avoid" capabilities (*e.g.*, Traffic Collision Avoidance System (TCAS) II; ADS-B; additional active sensors to meet maritime "due regard" requirements; etc.).

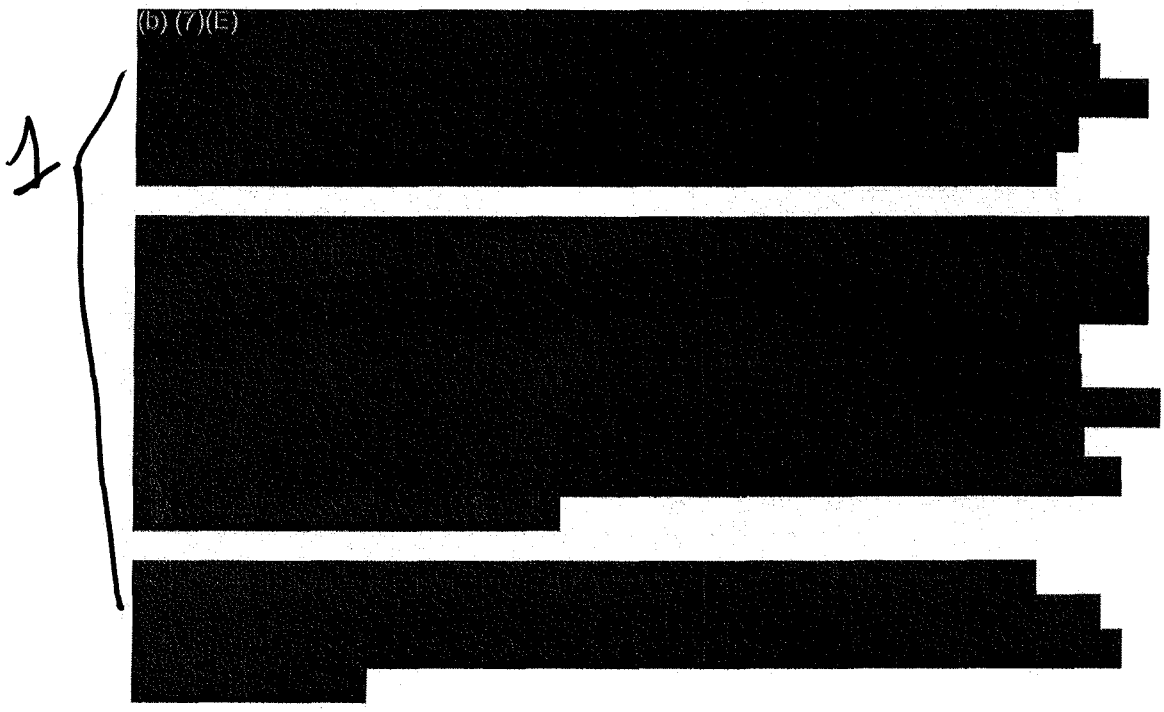
c. Datalinks

C2 datalink requirements will continue to evolve, specifically to address simultaneous operations in three OPAREAs. In addition, as CONOPS and SDCIP TTPs are refined, additional mission data download requirements may emerge (e.g., more FMV). Existing UAS datalinks will need to be updated or replaced as control and communications standards are established. Back-up terrestrial links should continue to evolve.

d. Airspace Access

Airspace access will continue to be the dominant factor in executing mid-term CONOPS. In this period, access to mission-essential airspace, including land border regions, offshore Warning Areas, and Control Area/Flight Information Region (CTA/FIR) airspace, will be achieved through one or more of the following:

- FAA-issued COA
- Use of SUA Restricted and/or Warning Areas
- Introduction of UAS airspace integration (AI) capabilities.



e. Basing

For future maritime UAS operations, potential locations include: Corpus Christi patrolling the Gulf of Mexico environmental spill in W-157; Fort Drum, New York to patrol R-5203 over Lake Ontario; Alpena, Michigan to patrol R-4207 over Lake Huron; or Traverse City, Michigan to patrol R-4305 over Lake Superior.

f. Mission Profiles

1

(b) (7)(E)

2

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g. Vignettes

3

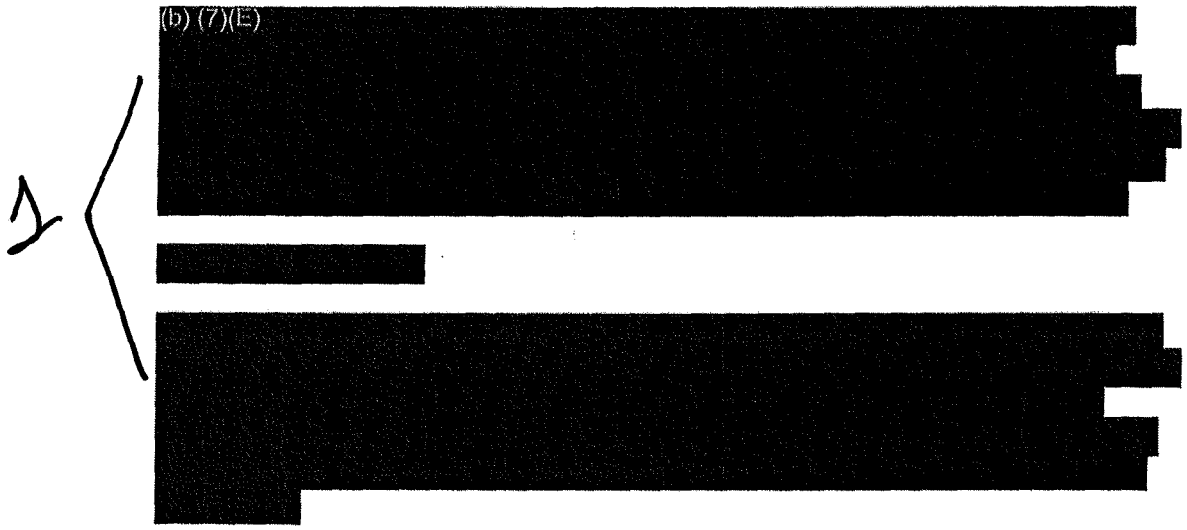
(b) (7)(E)

(b) (7)(E)

(b) (7)(E)

[18] North Bass Island, also known as Isle St. George, is the northern most of Ohio's Lake Erie islands. It is located 18 miles from the Ohio mainland and less than two miles from the international border with Canada. (Source: Ohio Department of Natural Resources).

[19] "BC bud" is a generic term for several varieties of potent cannabis grown in the Canadian province of British Columbia.



3. Far-Term CONOPS

a. Overview

The far-term CONOPS period is defined as those years beyond the current budget cycle, a period in which programmatic funding is undefined and new starts are possible. Resource planning focuses on development of new or improved capabilities that take advantage of emergent technologies to fill current or emergent capability gaps. The far-term period will be characterized by:

- Expansion of UAS operations to FOLs in the Transit Zone
- Publication of various UAS AI standards, including sense-and-avoid performance standards, which will impact UAS equipment requirements
- The initial phase of NextGen, the FAA's modernization of the NAS
- Modernization of CBP UAS C2 through AMOC improvements
- Use of UAS as host for other agency projects on a not to interfere with operational mission's basis
- Modernization of the OAM UASs through Block upgrades
- Determination of CBP UAS Increment III requirements.

Although beyond the scope of this document, Maritime UAS operations in the far-term will witness the introduction of the USCG's National Security Cutter, Offshore Patrol Cutter, land-based UAS capable of meeting additional USCG missions, and cutter-based UAS, into DHS operations. In addition, OGAs such as DOD and NOAA will continue to expand UAS operations and introduce new types of UAS.

The UAS program has resource planning that supports a robust modernization program, driven by an integrated product roadmap. New capabilities, including improved sensors, may be leveraged from DOD or OGA Block upgrade efforts.

b. Payloads

The most significant impact to payloads in the far-term will be the finalization of UAS AI performance standards and procedures. The FAA mandated technical standards for UAS hazard avoidance have the potential to impact UA platform CNS/ATM equipment, as well as sensors and ancillary systems that support airspace compliance. GCS datalinks may also be impacted in terms of reliability, redundancy, latency, security, and/or spectrum compliance requirements.

Mission sensor upgrades could include improving SAR point target resolution to well below one foot, a simultaneous SAR-GMTI/MMTI mode and advanced ATR/ATC algorithms. Visual and IR band sensors will be updated with newer generation arrays. The addition of an Electronic Support Measures suite with specific emitter identification will increase mission effectiveness by enabling the UAS to independently perform the SDCIP Identification task. Additional payload upgrades could include expendables or non-lethal weapons designed to immobilize TOIs.

c. Datalinks

C2 datalink requirements will continue to evolve and may include collaborative C2 with OGAs. Improved C2 resulting from AMOC expansion will enable mission flexibility and interoperability with OGAs. Upgrades may adopt or leverage DOD datalink and satellite architectures to further improve interoperability.

d. Airspace Access

(b) (7)(E)

[redacted]

Health Monitoring: The process of monitoring the state or condition of a component.

(b)(7)(E)

Identification: (1) The process of determining the friendly or other-than-friendly character of an unknown detected contact, and (2) The process of attaining an accurate characterization of detected objects to the extent that high confidence, timely application of tactical options and resources can occur.

Imagery: Collectively, the representation of objects reproduced electronically or by optical means on film, electronic display devices, or other media.

Information: The meaning that a human assigns to data by means of the known conventions used in their representation (e.g., an image is information provided by the binary code [0s, 1s] of sensor data).

Information Assurance: Information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.

Infrared Imagery: That imagery produced as a result of sensing electromagnetic radiation emitted or reflected from a given target surface in the infrared portion of the electromagnetic spectrum (approx. 0.75 to 12.4 microns).

Intelligence: The product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information concerning an adversary or areas.

Joint Force Commander: A general term applied to a combatant commander, sub-unified commander, or Joint task force commander authorized to exercise command authority or operational control over a Joint Force (e.g., JIATF-S).

Appendix F – Signature Page for CONOPS

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