

**WRITTEN TESTIMONY OF  
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE**

**ON NOAA'S CONTRIBUTIONS TO  
THE NATIONAL HOMELAND SECURITY MISSION**

**HEARING BEFORE THE  
COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION  
SUBCOMMITTEE ON DISASTER PREVENTION AND PREDICTION  
UNITED STATES SENATE  
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Mr. Chairman and Members of the Committee, I am Conrad Lautenbacher, Administrator of the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce. Thank you for the opportunity to appear before you today to discuss NOAA's contributions to the national homeland security mission. I am proud to lead a team of men and women whose daily activities advance our homeland security and strongly believe NOAA's contribution is of tremendous benefit to the United States.

Although NOAA is best known as a premier science and service agency whose mission is to describe and predict changes in the Earth's environment, NOAA's expertise and services can be applied to many other areas, including national security. NOAA's responsibilities for the environment, safety, and commerce of this nation span the oceans, coasts, and atmosphere. The capabilities that are part of NOAA's standard daily operations often are vital during times of emergency.

NOAA has established a Homeland Security Program Office to serve as the principle point of contact for NOAA regarding homeland security programs across the entire agency. This office coordinates homeland security programs, ensures continuity of operations, and prepares for continued delivery of services during emergencies.

**NOAA HOMELAND SECURITY PRODUCTS AND SERVICES**

After reviewing the full range of its capabilities, NOAA has identified more than 50 capabilities that could immediately advance the Nation's homeland security efforts. NOAA leverages these already existing programs, technologies, and expertise in new and innovative ways to assist the U.S. Department of Homeland Security (DHS) and has actively partnered with many other agencies (state, local and federal) to address homeland security issues. I will review a few of our contributions.

**Alerts and Public Warnings**

The National Weather Service broadcasts warnings, watches, forecasts, and other hazard information regarding tornados, flash floods, and other potential life-threatening situations 24

hours a day, 7 days a week, via a nationwide network of radio stations. NOAA coordinates these warnings and advisories with the Federal Emergency Management Agency. Working with the Federal Communications Commission's Emergency Alert System, the NOAA Weather Radio was expanded to serve as an "all hazards" radio network. In June 2004, this system's capabilities were further expanded to allow DHS to send critical all-hazards alerts and warnings directly through the NOAA All-Hazards Network. The NOAA All-Hazards Network consists of over 950 radio transmitters located throughout the United States and U.S. possessions and territories, allowing the transmission of weather watches, warnings, and advisories as well as non-meteorological civil emergency messages to over 97% of the population. NOAA Weather Radio/All-Hazards now provides alerts for both natural (severe storms, hurricanes, tornadoes, earthquakes, and volcanic activity) and environmental (chemical spills and bio-hazardous releases) events. The all-hazards capability is being implemented through agreements with local, state, and federal emergency managers and first responders. NOAA is presently developing a capability to reduce the time it takes for an emergency manager to input a hazard warning into NOAA Weather Radio/All-Hazards. This will reduce the input time from seven minutes to less than two minutes. This capability will allow emergency managers direct access to the Emergency Alert System via NOAA Weather Radio/All-Hazards, and is expected to be fully operational in Fiscal Year 2006.

To complement this new homeland security messaging capability, we will work with DHS and the U.S. Department of Education to provide NOAA Weather/All-Hazard Radios to public schools in select top urban areas and two rural states during National Preparedness Month in September 2005.

In addition to the traditional weather radio that many are familiar with, NOAA Weather Radio/All-Hazards receivers can be integrated into devices to turn on alarms, lights, bed shakers, and other equipment especially useful for the hearing impaired community and those with special needs. RCA/Thomson has developed a new line of televisions, called *AlertGuard*, which integrate a NOAA Weather Radio/All-Hazards receiver into television sets.

DHS is leading the effort to develop a government-wide plan for the Integrated Public Alert and Warning System (IPAWS). Public warnings save lives by informing, reducing fear, and assisting emergency managers. There are many warning systems in place across the country, and while each of these systems can reach the public directly, no one system reaches everyone. NOAA information dissemination systems, including NOAA Weather/All-Hazards Radio, as well as information posted directly on the Internet and supplied to radio and television stations, will be a part of a larger integrated national emergency warning system.

In response to the 2004 Indian Ocean Tsunami, NOAA is committed to expand the U.S. Tsunami Warning Program to protect U.S. lives and property along all coasts (Pacific, Atlantic, Gulf of Mexico, and Caribbean). In order to continue the Administration's commitment to strengthen the Tsunami Warning Program and mitigate potential impacts from a similar tsunami event in the U.S., NOAA will build on its existing foundation of sensors. NOAA will accomplish this by deploying 39 additional Deep-ocean Assessment and Reporting of Tsunamis (DART) buoy systems strategically sited in the Pacific, Atlantic, and Caribbean basins. Data from DART buoys will aid U.S. tsunami forecasters in providing detailed tsunami forecasts. The enhanced

program will also aid tsunami hazard mitigation actions including inundation flood mapping, evacuation mapping, and community-based public education, awareness, and preparedness. NOAA will operate and maintain the expanded DART system, new sea-level monitoring stations, and the upgraded local seismic networks from the 24/7 West Coast/Alaska Tsunami Warning and Pacific Tsunami Warning Centers.

### **Forecasts and Dispersion Modeling**

NOAA forecasts include the creation of numerical models of the atmosphere used for flight planning, ship routing, and energy distribution. These numerical forecasts are used to model the dispersion of airborne hazardous materials such as volcanic ash, industrial chemical releases, and radiological accidents.

NOAA's operational air dispersion models help emergency planners detect and track chemical, biological, and radiological hazards in the atmosphere. When an event occurs, first responders can use laptop applications for hazardous material (hazmat) modeling of industrial chemicals on scene and NOAA regional models accessible through the local Weather Forecast Office.

One of NOAA's major contributions in emergency preparation and response is the software program CAMEO (Computer-Aided Management of Emergency Operations). Jointly designed with the Environmental Protection Agency (EPA), CAMEO is widely used by firefighters and serves as a primary tool in preparing for and responding to chemical incidents. An updated version of CAMEO was released in March 2004. It contains a chemical database of over 6,000 hazardous chemicals with chemical-specific information on fire and explosive hazards, health hazards, firefighting techniques, cleanup procedures, and protective clothing. NOAA and EPA are expanding the CAMEO chemical database to include information on weapons of mass destruction. The ALOHA (Areal Locations of Hazardous Atmospheres) atmospheric dispersion model is a computer program used in conjunction with the CAMEO to predict how a hazardous gas cloud might disperse in the atmosphere after a chemical release based on the physical characteristics of the released chemical and atmospheric conditions. The program can display the location of facilities storing hazardous materials as well as buildings of high concern, such as hospitals and schools. ALOHA is being expanded to predict the impact of fires and explosions.

NOAA's Air Resources Laboratory and Hazmat program are in the early stages of developing a Chemical Threat Analysis Planner to improve our ability to evaluate potential threats from hazardous material releases using the HYSPLIT dispersion model in conjunction with the CAMEO database. Additional future developments will fully integrate CAMEO/ALOHA with national-level emergency information management systems including the Interagency Modeling and Atmospheric Assessment Center (IMAAC).

Under the National Response Plan, the IMAAC is the single source of federal hazards prediction information during the response and recovery phase of Incidents of National Significance for atmospheric transport and dispersion of hazardous releases. NOAA is working with DHS to develop procedures to organize and coordinate federal emergency response through this Center, providing decision-makers with custom products and a single point of contact for all-hazards dispersion modeling predictions and assessments. NOAA and DHS are working to integrate CAMEO/ALOHA and HYSPLIT into the suite of IMAAC.

NOAA is conducting a pilot program to integrate real-time weather models and hazardous plume predictions to provide DHS with the ability to identify specific areas to issue targeted homeland security alerts and warnings using reverse 911 technologies. In this pilot program, called Geo-Targeted Alerting System (GTAS), forecasters at the NOAA Weather Forecast Office located in Sterling, Virginia will provide DHS with toxic plume dispersion information. Given the dispersion forecast of a toxic cloud, DHS officials will be able to select several “targeted” warning areas to provide specific public safety information for each area using applications developed by NOAA’s Forecast Systems Laboratory.

Monitoring stations have been installed in Washington, D.C., to support one of the first dispersion forecasting systems specifically designed for urban areas. These stations, known as DCNet, collect and analyze standard meteorological data (as well as wind speed, direction, and turbulence data) at frequent intervals to help define downwind areas of potential high risk. In doing so, DCNet allows users to gain a better understanding of how hazardous trace gases and particles are dispersed in urban areas. During the 2005 Presidential Inauguration, NOAA and DHS closely monitored this information, which was then immediately available for dispersion model runs in the event of an incident.

NOAA has provided much of the Nation's atmospheric tracer expertise since the 1950s. The center of excellence resides within the Air Resources Laboratory (ARL) at Idaho Falls, Idaho where the ARL Field Research Division is located. In recent years, the ARL team has conducted field studies in Salt Lake City and Oklahoma City, to support the major atmospheric dispersion field studies conducted under the sponsorship of a number of agencies, led by DOE, DHS, and DOD. In the last two years, studies have been conducted in New York City and in Washington, D.C. Building upon them, the ARL team is about to engage in a new round of fieldwork, again focusing on New York City and Washington, D.C. The D.C. work will be concentrating on the Pentagon and its surroundings (sponsored by DOD), the New York project will focus on midtown Manhattan (sponsored by DHS).

The New York City study also involves two other ARL groups, located at Oak Ridge, Tennessee, and Research Triangle Park, North Carolina. The Oak Ridge group is leading the design of a surface meteorological network to help guide the development of local dispersion forecasting (an extension of the DCNet experience in Washington D.C.), sponsored by DHS. The Research Triangle Park group is conducting Comprehensive Fluid Modeling studies and wind tunnel physical modeling investigations, both sponsored by EPA.

### **Remote Sensing**

NOAA continues to use Light Detection and Ranging or Lidar, a technique similar to Radar, using laser for mapping terrain elevation features and high quality aerial photography to collect data in support of homeland security surveys. Specifically, these technologies can be used to protect critical infrastructure, aid in disaster response and recovery efforts, verify dispersion modeling and provide support for special security events.

Currently NOAA is evaluating a remotely operated aircraft (ROA) for future science and operational requirements within the agency related to oceanic and atmospheric research, climate

research, marine sanctuary mapping and enforcement, nautical charting, and fisheries assessment and enforcement. The platform NOAA is using is a variant of the General Atomics Aeronautical System's Predator B, a high-altitude, long-endurance ROA that has successfully supported Operation Iraqi Freedom. NOAA worked with the U.S. Coast Guard (USCG) to ensure the common operating areas and requirements both agencies shared were incorporated into the ongoing planning and operational flights. This interaction has resulted in both agencies leveraging their expertise and resources to carefully evaluate the potential benefits ROAs may provide for both agencies' operational requirements.

NOAA demonstrated the support ROAs could provide through streaming video from a ROA operating off the coast of California and provided to the Homeland Security Operations Center (HSOC) in Washington, D.C. While only an initial demonstration, NOAA fed live video imagery over a satellite Internet connection to NOAA's Boulder, Colorado facility and then directly to the HSOC, showing the potential these platforms can provide for both incident and situational management.

### **Integrated Ocean Observing System and Maritime Domain Awareness**

NOAA has assisted the U.S. Coast Guard and the U.S. Navy in implementing the Maritime Domain Awareness (MDA) Program, to develop a national strategy to ensure interagency coordination of homeland security policy and requirements in marine areas. MDA includes anything associated with the global and coastal maritime environment that could adversely impact the security, safety, economy, or environment of the United States. This knowledge is used both operationally in the planning and execution of homeland security missions, and by researchers supporting the development of new homeland security capabilities.

To meet a wide range of societal needs, our country has embarked on a program to develop an Integrated Ocean Observing System (IOOS). IOOS is the integration of existing and planned observing systems to meet common research and operational agency needs in the following areas:

- Detecting and forecasting oceanic components of climate variability
- Facilitating safe and efficient marine operations
- Ensuring national and homeland security
- Managing resources for sustainable use
- Preserving and restoring healthy marine ecosystems
- Mitigating natural hazards
- Ensuring public health

The backbone network of coastal observations can be of dual use in supporting both civil and homeland security objectives. IOOS will enhance national and homeland security in our coastal waters and ports through improving Maritime Domain Awareness and through improved observations and predictions of the ocean environments in which homeland security operations take place.

On September 24, 2004, Admiral James Loy, Deputy Secretary of the Department of Homeland Security, and Paul McHale, Assistant Secretary of Defense for Homeland Defense, convened the

first meeting of the MDA Senior Steering Group. Admiral Loy's opening comments addressed the urgent nature of the job at hand, the need to draw on the resources of supporting agencies, and the move beyond study to deployable capabilities. He made reference to the roll out of the U.S. Commission on Ocean Policy Report and noted the reference to an IOOS. He remarked, "If that's not Maritime Domain Awareness, I don't know what is." Admiral Loy recognizes interagency capabilities can be leveraged for a proactive, forward deployed maritime defense.

As a part of this overall program, USCG and NOAA are developing marine two-way communications systems on NOAA data buoys to relay Automated Identification Signals (AIS) through satellite links to the USCG for vessel tracking. AIS is a shipboard system that broadcasts vessel data such as name, course, speed, and call sign to other AIS vessels and stations for collision avoidance at sea. AIS previously was only carried by VHF signal and therefore had a limited range. The installation of satellite relays on NOAA data buoys will expand the USCG capability to monitor and track vessels approaching U.S. territorial waters well beyond the line of site limit for VHF.

NOAA officers, ships, and Navigation Response Teams surveyed the shipping channels of over 30 strategic commercial ports in 2002 to collect high-resolution imagery requested by the U.S. Navy. These surveys provide the baseline data of pre-existing objects so mine countermeasure assets can be utilized more effectively to determine if a mine has been placed on the sea floor. Using hydrographic survey techniques, NOAA is working with the Navy and USCG to improve our mine detection capabilities in ports. NOAA and the Defense Counter Terrorism Technology Support Office are developing an Underwater Domain Awareness capability for ports, harbors and inland waterways. This partnership will support USCG with rapid response capabilities to better detect and classify underwater threats and enhance their ability to ensure safe and secure waterways critical for the transit of military and commercial vessels. In the next phase of this partnership, we will be focusing on Autonomous Underwater Vehicles and Autonomous Surface Vehicles to improve the speed and flexibility of response and protect survey personnel by providing greater stand-off during higher risk surveys. Remotely Operated Vehicles will be used for underwater surveys to localize and identify detected anomalous objects.

NOAA has implemented a national Vessel Monitoring System (VMS) program that provides infrastructure, economies of scale and coordination across National Marine Fisheries Service (NOAA Fisheries) regions and offices. The expanded use of VMS provides one of the strongest potential solutions to supplement traditional enforcement activities. This system provides near-real time fishing vessel monitoring, control and surveillance throughout the U.S. Exclusive Economic Zone (EEZ), Pacific Ocean, and Atlantic Ocean. It also provides critical, life saving, information to the Coast Guard in support of their response in Search and Rescue (SAR) missions. VMS uses the Global Positioning System (GPS), satellite communications, and a secure network to monitor fishing vessel compliance. However, this evolving capability could be used for marine enforcement and homeland security requirements since it can identify and track vessels, as well as provide information for a maritime domain common operating picture. An expanded VMS could encompass the entire nation and relay near real-time data to the USCG for enforcement and homeland security purposes. VMS, if fully developed, could provide extensive observational coverage of our Nation's EEZ.

## **Response**

NOAA has a wide range of capabilities in its day-to-day operations that can be used to prepare for catastrophic events. For example, surveying and charting are NOAA activities mandated by Congress. After Hurricanes Frances, Ivan, and Jeanne in 2004, NOAA deployed Navigation Response Teams (NRT) for emergency surveying to quickly reopen Gulf Coast ports, demonstrating the economic, safety, and MDA benefits of rapidly resurveying ports and harbors. The NRTs conduct hazardous obstruction surveys along our coasts to update NOAA nautical charts. They also serve as research platforms testing equipment and developing new ways to effectively and efficiently survey navigable waterways.

NOAA's hydrographic survey vessels are occasionally called upon by the USCG to acquire detailed side scan and multi-beam survey images for search and recovery, as was the case following TWA 800 and the EgyptAir crashes. In 2004, NOAA assisted a USCG investigation by locating and obtaining high-resolution imagery of the Bow Mariner, an ethanol tanker that exploded and sank off the Virginia Capes. This capability is another weapon in the defense against maritime threats, as it allows ports to be re-opened quickly and helps the USCG to design temporary lanes and detours based on depth data. We rapidly disseminate chart updates and critical chart corrections to the mariner, and we can create and distribute temporary charts, overlays and data sets as needed by primary responders like the Coast Guard.

NOAA's Hazmat Scientific Support Coordinators (SSC) work in USCG offices, planning for emergencies and developing port-specific incident response plans. These plans highlight specific problems, such as those faced by chemical facilities in port areas. NOAA also develops computer programs used for both incident-specific planning and routine training. This preparedness training is vital because, when an event occurs, first responders need to have a range of tools they are familiar with and can apply. NOAA SSCs are then able to go on-site during emergencies to bring all of NOAA's support resources to the table.

When discussing NOAA's response capabilities, it would be remiss of me not to mention the NOAA Corps, one of the Nation's seven Uniformed Services. These officers primarily have science and engineering backgrounds, stand ready to support the Coast Guard, Department of Defense (DOD), and any other Federal agency that requires assistance in protecting the Nation's security. At the request of the DOD, NOAA has provided a summary of its capabilities, ships and aircraft that could be used in a national emergency. NOAA's Office of Marine and Aviation Operations (OMAO) operates a diverse fleet of research and hydrographic coastal and ocean-going vessels ranging in length from 90 to 274 feet, as well as helicopters and airplanes. OMAO abilities to assist port security efforts include assisting the USCG boarding or inspection parties, supporting port/harbor security, providing sophisticated airborne chemical detection support, conducting hydrographic surveying/sea floor mapping and Geographic Information System (GIS) development, conducting state-of-the-art sonar operations, and providing additional hurricane reconnaissance if U.S. Air Force assets are reassigned.

## **Space Based Assets**

The National Environmental Satellite, Data and Information Service provides real and near-real time satellite imagery through geostationary and polar-orbiting environmental satellites. NOAA

acquires and manages the Nation's operational environmental satellites and provides data and information services. Information and observations from NOAA's orbital assets are used in weather forecasting, aviation and marine operations, agricultural applications, on-scene weather support for incidents, sea surface temperature measurements for the fishing industry, and volcanic ash detection and tracking. However, they can also be used for security purposes.

NOAA satellite imagery detected the smoke plume emanating from New York City following the events of September 11, 2001. Using the NOAA Geostationary Operational Environmental Satellite (GOES), we were able to detect the development and dispersion of that smoke plume. Monitoring the extent and the direction of the plume helped to define areas of potential health risk from hazardous particulates in the plume. NOAA provided emergency satellite frequencies for the health community to relay measurements from air quality sensors at the World Trade Center site.

NOAA licenses and enforces compliance with Federal regulations for operating a commercial or private earth observing satellite. Enforcement of the regulations applying to shutter control or restriction of data distribution is essential to ensure national security. NOAA enforces stated limitations of the Kyl-Bingaman Act prohibiting U.S. commercial satellite companies from collecting and releasing imagery of specified areas.

NOAA's orbital assets also support international search and rescue efforts. The satellites carry transponders for search and rescue beacon signals from downed air and marine craft, and from personal locator beacons. NOAA's search and rescue function is part of an international program for detection of distress signals from aircraft, vessels, and personal locator beacons. This global program relies on, and supports, other nations in the collection and processing of search and rescue signals.

Orbital imagery and data are also used for detecting and monitoring of wild fires. Tracking smoke plumes is an important part of the response to a fire event as it may create health problems and visibility issues. Wind and other weather data from the satellites, when paired with the smoke plume detection help us understand the extent of the fire, and support other agencies with firefighting responsibilities. Most frequently, when NOAA satellites detect a plume it is the result of a volcanic eruption. The United States has a number of active volcanoes, notably Mt. Spurr in Alaska, and Mt. St. Helens in Washington, which are in heavy aviation corridors. Eruptive events create very real threats to the aviation industry.

## **COORDINATING HOMELAND SECURITY PROGRAMS**

As I have outlined today, NOAA continues to form collaborative partnerships with state, local and federal entities charged with addressing homeland security issues. Through the Homeland Security Program Office, we provide support directly to DHS. NOAA staffs a desk at the Homeland Security Operations Center (HSOC) to provide operational communications, information and resource coordination supporting management of domestic Incidents of National Significance and National Special Security Events. The Homeland Security Program Office plays a vital coordination role as the NOAA point of entry into Homeland Security operations and is responsible for keeping NOAA executive management appropriately informed and engaged.



The Interagency Incident Management Group (IIMG) is a DHS led structure facilitating a comprehensive, integrated and coordinated approach to domestic incident management. The IIMG is collocated and supported by the HSOC staff. IIMG members provide decision-making support to the Secretary of Homeland Security and other national authorities during periods of elevated alert and national-level domestic incidents. Specifically, NOAA provides subject-matter experts supporting chemical, radiological, and nuclear weapons of mass destruction events and natural disasters.

Citizen Corps was launched by DHS “as a community based initiative to engage all citizens in homeland security and community safety and family preparedness through public education and outreach, training opportunities, and volunteer programs.” In July 2003 a Statement of Affiliation between DHS and NOAA was signed by Undersecretary Michael Brown and me in order to establish a collaborative partnership raising public awareness about weather and environmental hazards as well as promoting actions for public safety.

NOAA Fisheries’ Office for Law Enforcement is dedicated primarily to the enforcement of laws that protect and regulate our Nation's living marine resources and their natural habitat. NOAA Fisheries' special agents and enforcement officers enforce many federal statutes, as well as numerous treaties related to the conservation and protection of marine resources through the prosecution of both civil and criminal violations. Notwithstanding OLE’s joint enforcement partnerships with 27 coastal state agencies, the U.S. Coast Guard continues to be OLE's strongest ally in enforcing marine resource laws and fishery management. The cooperative support from the Coast Guard enables OLE agents and officers to actively respond to suspected violations that might otherwise be unattainable.

With increased emphasis on Homeland Security and inter-agency collaboration, OLE’s expertise has also been applied to various task forces and maritime security initiatives nationwide including MDA, border operations and checkpoints, and dock patrols.

## **CONCLUSION**

In NOAA’s unique role as an information provider, we will continue to work closely with our partners to support the Nation with a wide range of services and products from hazardous material spill response capabilities to atmospheric and waterborne dispersion forecasting and support for communities and emergency responders. NOAA also is ready to provide NOAA’s ships, aircraft, global observing systems, and professional law enforcement officers to serve the Nation when the need arises. Thank you for inviting me here today to talk about NOAA’s homeland security programs.