

An Overview of Chemical, Biological and Countermeasures Test Bed Programs

Department of Homeland Security Science and Technology Directorate



Homeland
Security

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Experts warn of substantial risk of WMD attack. New survey predicts 70 percent chance of attack in next decade

Updated: 6:22 a.m. ET June 22, 2005

WASHINGTON - There is a 70 percent risk of an attack somewhere in the world with a weapon of mass destruction in the next decade, arms experts predicted in a survey released on Tuesday.

They also said up to five more countries are likely to acquire nuclear weapons within the next 10 years. The survey, conducted by U.S. Senate Foreign Relations Committee Chairman Richard Lugar, describes a threat that is “real and increasing over time” and endorses vastly increased funding for non-proliferation programs.



OHS & DHS: The Beginning

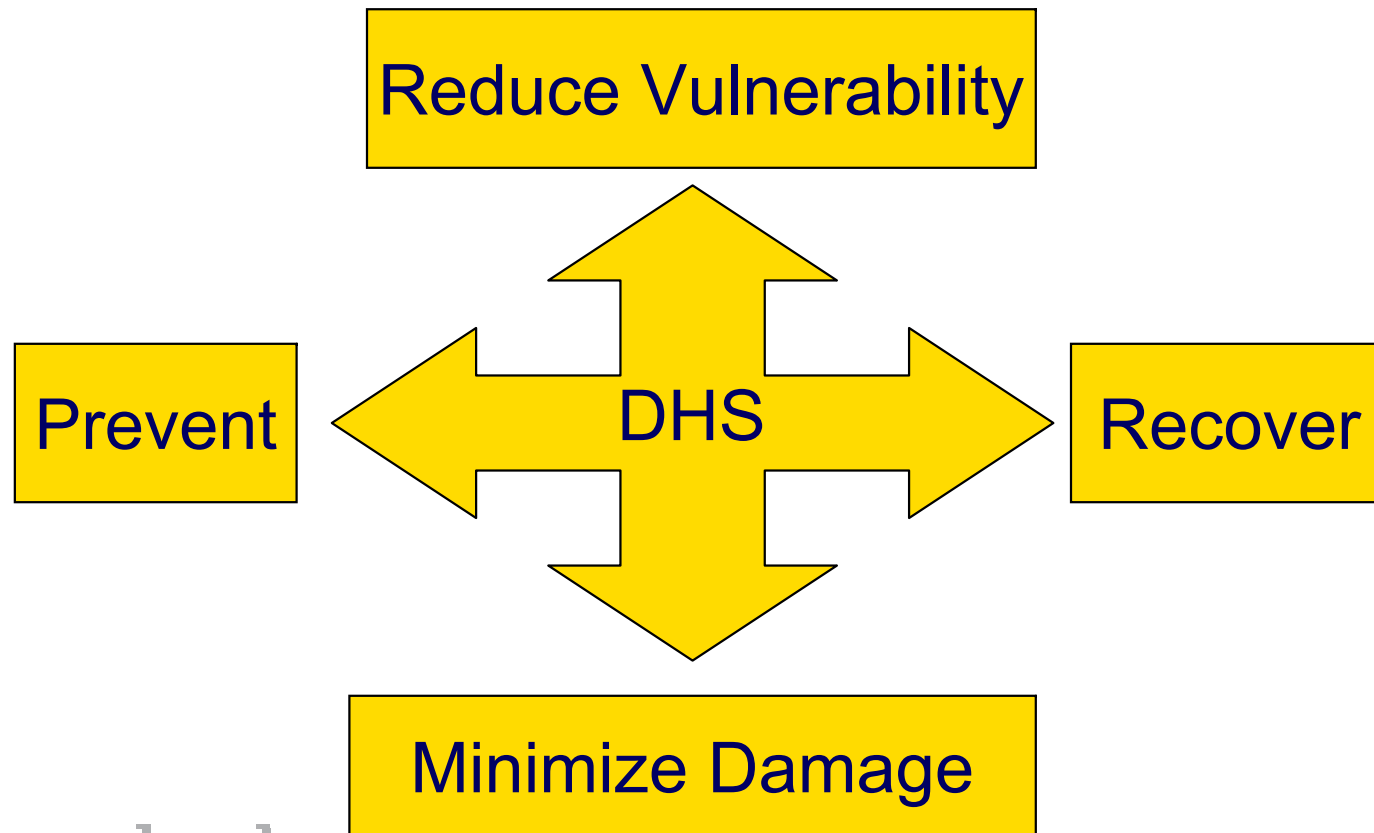
- **September 11, 2001**: Terrorists attack America
- **October 8, 2001**: President George W. Bush creates White House Office of Homeland Security
- **June 2002**: President George W. Bush introduces to Congress his proposal for a new Department
- **November 2002**: Congress passes the Homeland Security Bill
- **November 25, 2002**: President Bush signs the Homeland security Act into law
- **March 1, 2003**: The Department of Homeland Security is established



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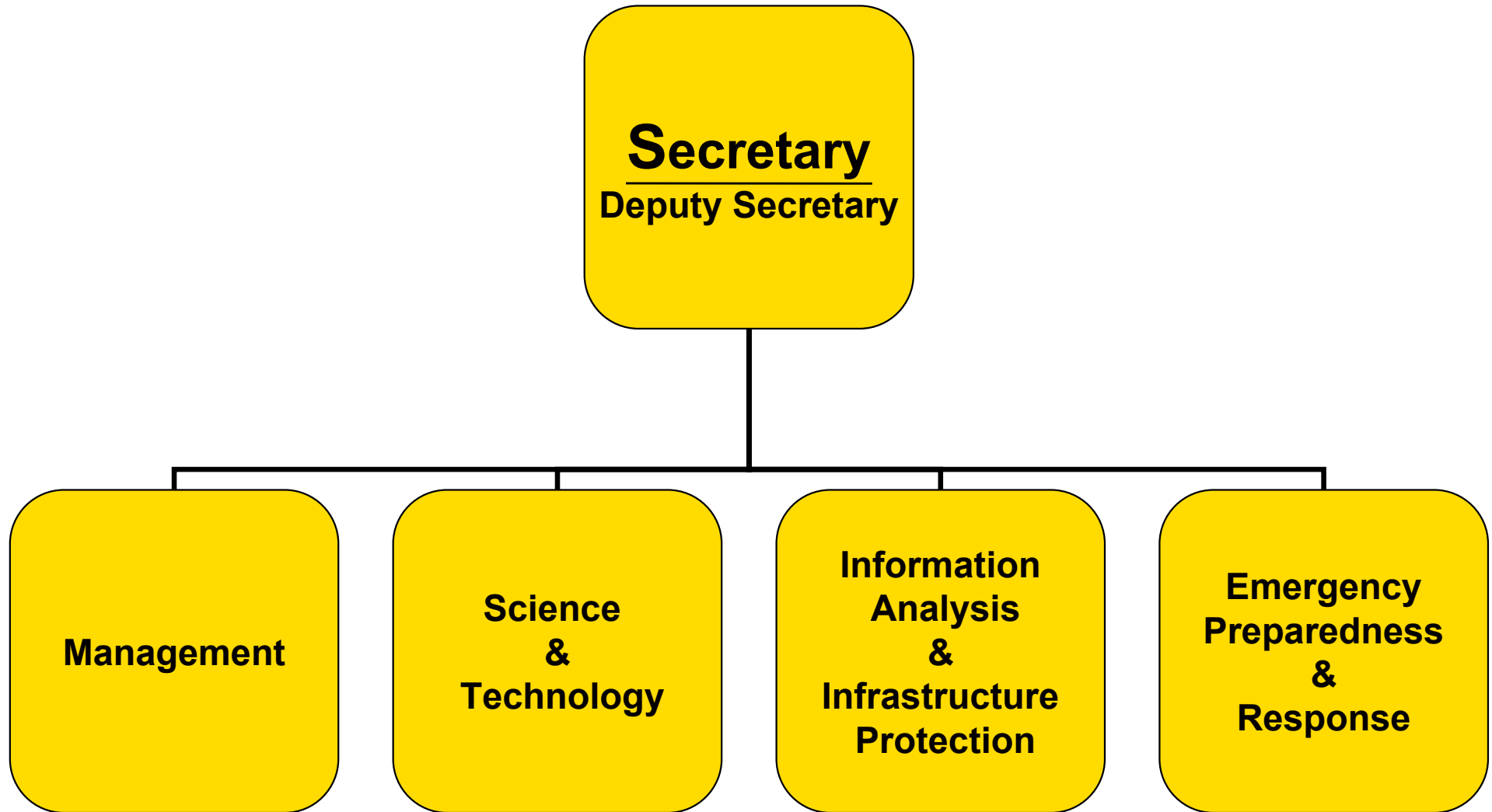
Homeland Security Defined

- Homeland Security is a **concerted** national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, minimize the damage and recover from attacks that do occur.

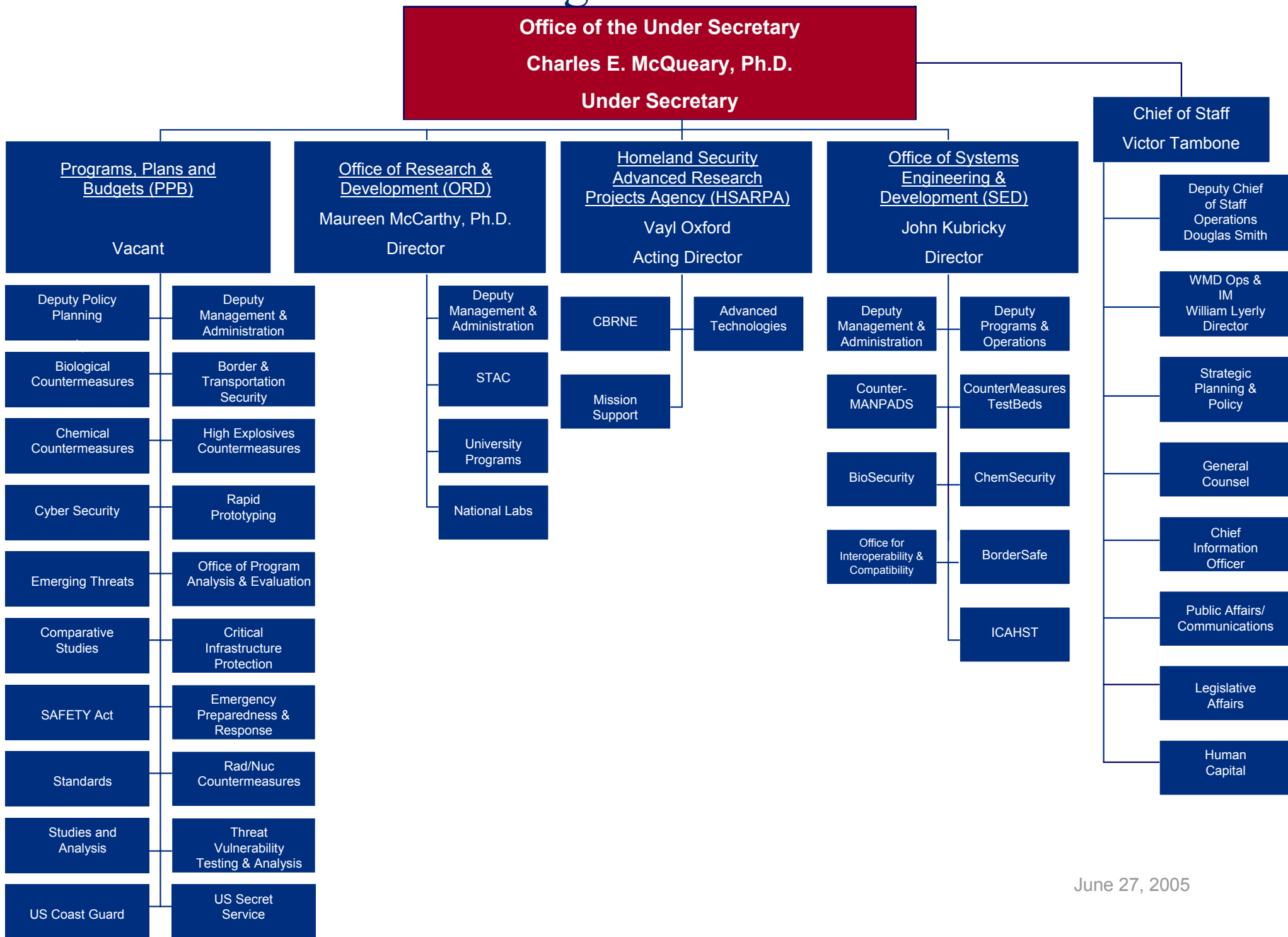


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DHS Organizational Chart



DHS S&T Organizational Structure



Office of Systems Engineering & Development Organization

Science & Technology Directorate

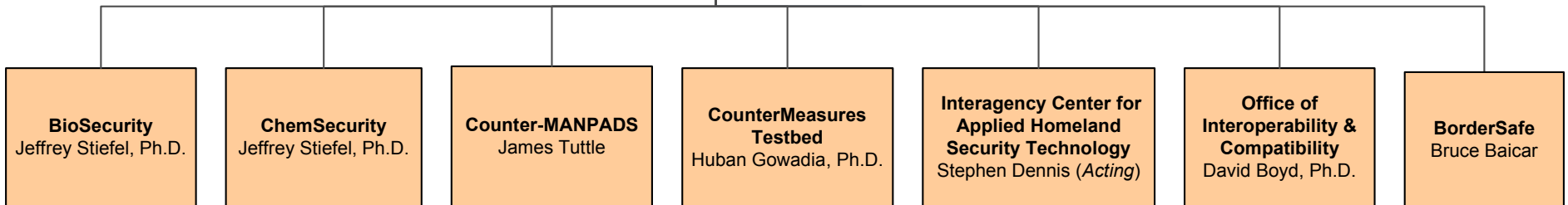
Under Secretary
Charles McQueary, Ph.D.

Office of Systems Engineering & Development

Director
John Kubricky

Deputy Director, P&O
David Boyd, Ph.D.
(Acting)

Deputy Director, M&A
Sharla Rausch, Ph.D.



SAFECOM

Biological Countermeasures Portfolio

COMING TO A CITY NEAR YOU !

ANTHRAX



ARMED AND DANGEROUS

HSPD-10 lays out an integrated end-to-end biodefense strategy

THREAT AWARENESS

- Intel
- Assessments
- Anticipate future threats

PREVENT & PROTECT

- Diplomacy
- Interdiction
- Critical Infra Protection

SURVEILLANCE & DETECTION

- Attack Warning
- Attribution

RESPOND & RECOVER

- Response Planning
- Risk Comm
- Med CM
- Mass Cas Care
- Decon



DHS plays a major role in the Nation's integrated biodefense strategy

Nat'l Response Plan

Nat'l Incident Mgmt Plan

Bio Incident Annex

- **DOS:** international aspects
- **HHS:** medical countermeasures & mass casualty care; anticipate future threats
- **EPA:** decontamination
- **DHS:** assessments; CI protection; attack warning; forensic anal; response plng; risk comm



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Several major initiatives are underway as part of this integrated strategy



- **BioShield:** to speed the development of medical countermeasures



- **BioSense:** to develop a national health surveillance system



- **BioWatch:** to develop a national urban environmental monitoring system

- **Integrated Biosurveillance:** to integrate human, animal, plant surveillance with monitoring of the air, food, and water and with intelligence data to provide overall situational awareness



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Biological Countermeasures Portfolio supports Sec DHS in his role

Mission Statement: *to provide the understanding, technologies, and systems needed to ...protect against...biological attacks on this nation's population, agriculture or infrastructure*

Lead

- overall coordination
- intelligence support
- early detection & attack analysis
- bio-forensics analysis

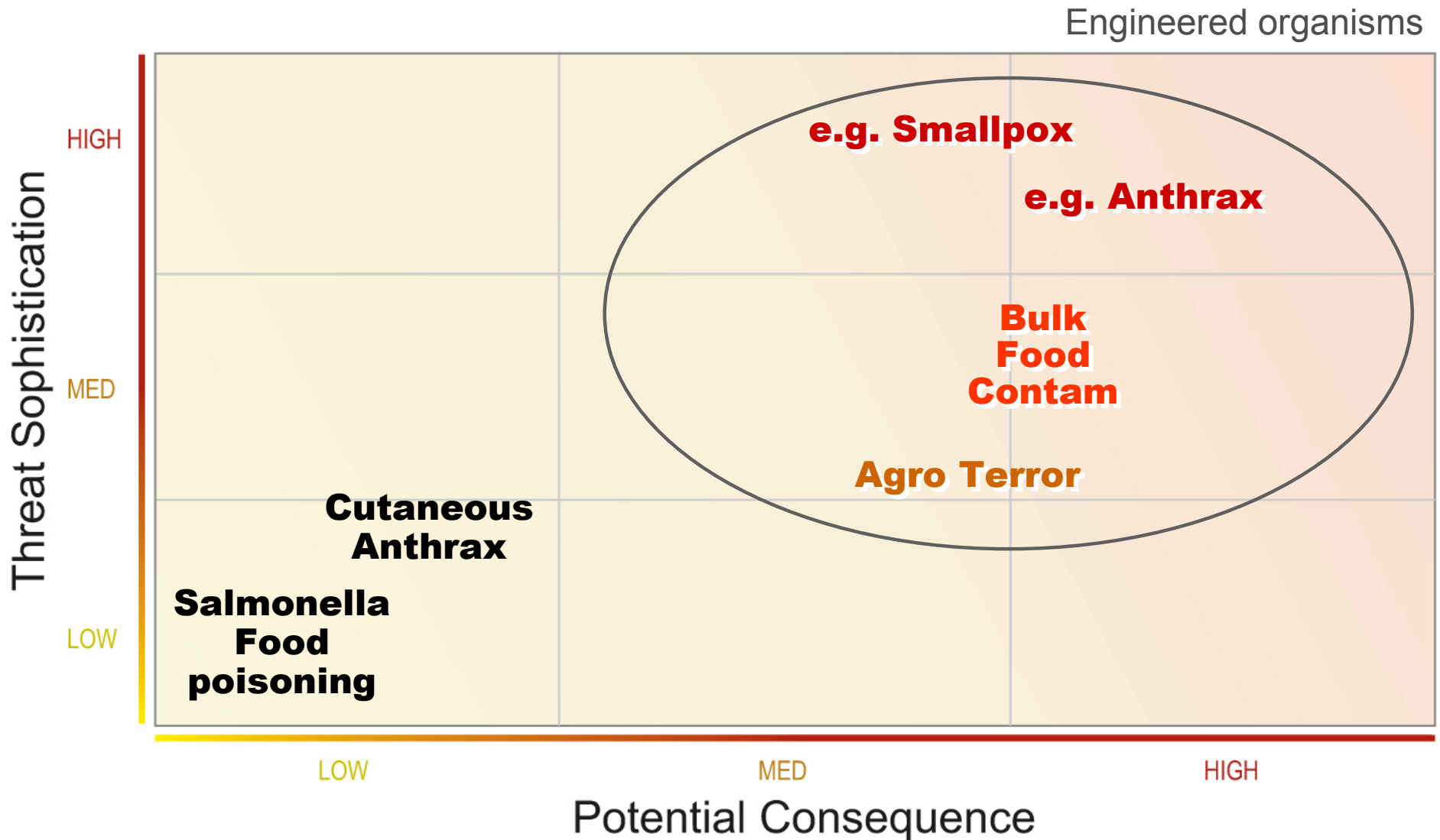
Partner/Support

- agro-defense
- decontamination

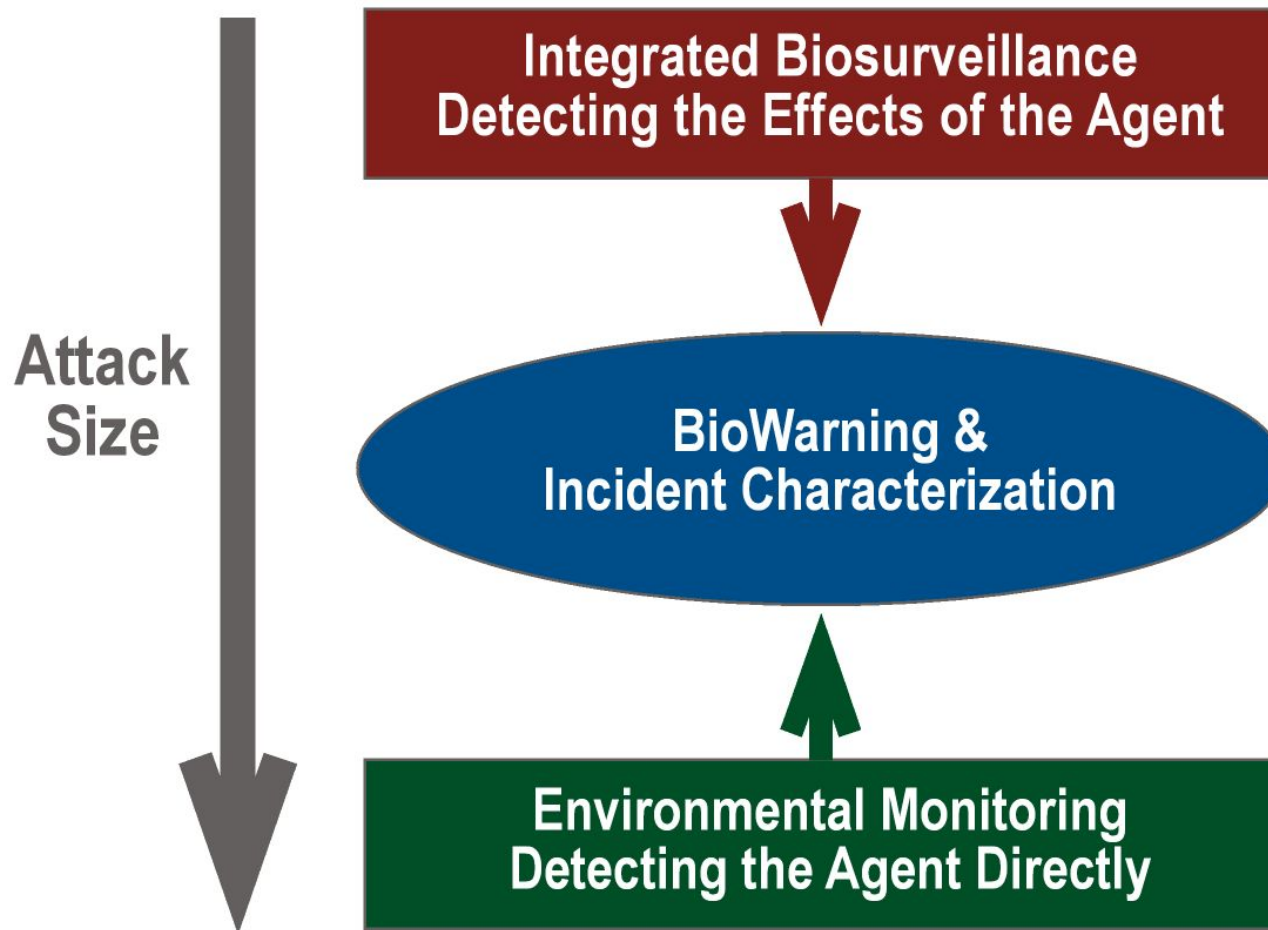


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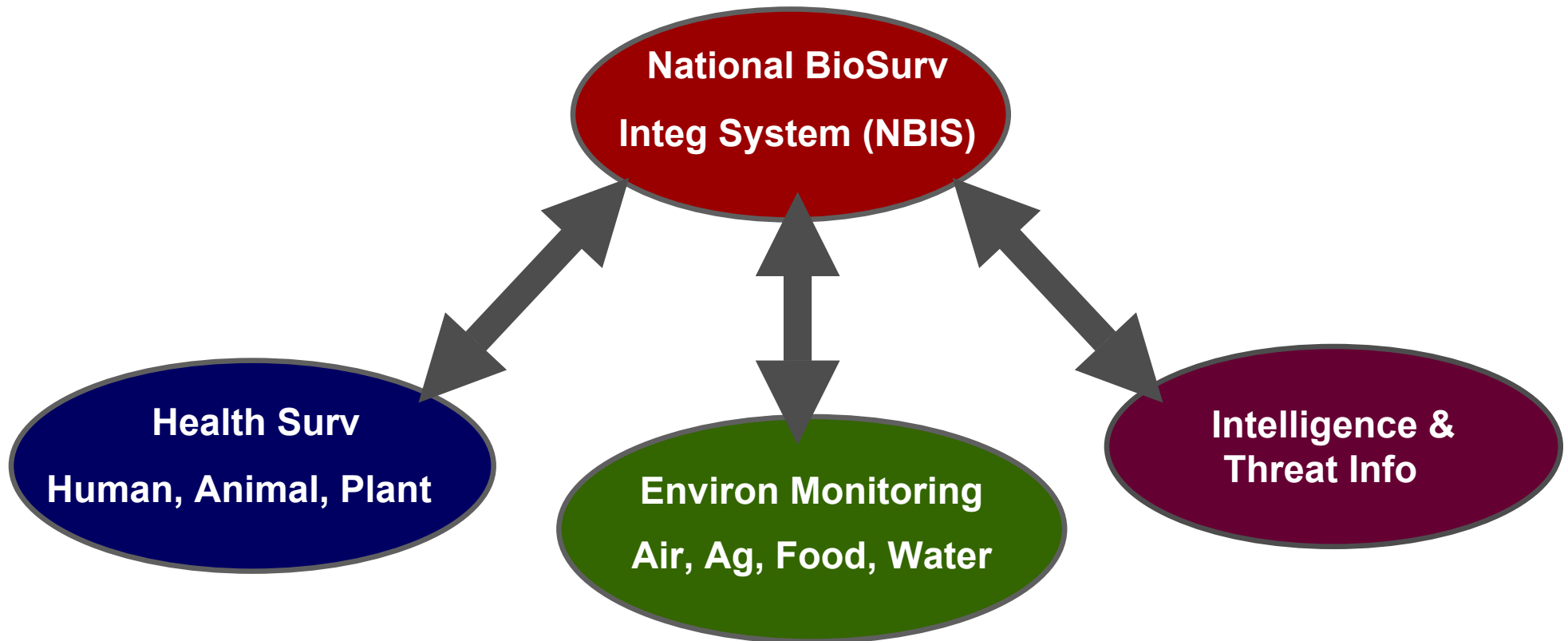
Our initial emphasis is on high consequence threats



Early detection is key to minimizing casualties



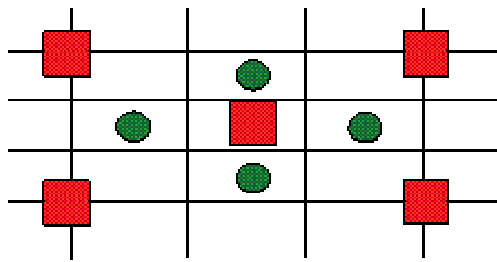
We are developing a National Biosurveillance Integration capability



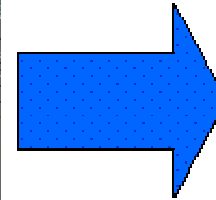
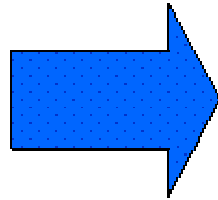
- Enable early detection
- Provide situational understanding to guide response
- Share information amongst partners



We are developing urban monitoring systems



Wide Area



- **Wide area monitoring (detect-to-treat)**

Phase 1 BioWatch (FY03) to increased sampling (FY05-06) to networked sensors (FY09-10)

- **Facility monitoring (detect-to-warn)**

Simple triggers/low regret responses (FY05-06) to improved detect-to-treat sensors (FY09 - 10) to improved design of new facilities

- **Coordination with other national programs**

With DoD force protection (BioNet, Guardian), with USPS Biohazard Detection System, with EPA and DARPA building protection programs



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MOU for Coordinated Monitoring of Biological Threat Agents

- MOU between DHS, DHHS, DoD, USPS and DOJ
- National need to integrate BioWatch, the Installation Protection Program (IPP), Biohazard Detection System (BDS) and future biothreat agent environmental monitoring systems to maximize detection capability, to make efficient use of resources, and to minimize response time following an attack
- Responsibilities:
 - A plan for coordination of current air monitoring programs and development of a national biomonitoring architecture
 - Shared, prompt notification
 - Biothreat agent test performance equivalency
 - Extension to other systems
 - Develop a joint technology roadmap to leverage Federal investments and to support future technology insertions



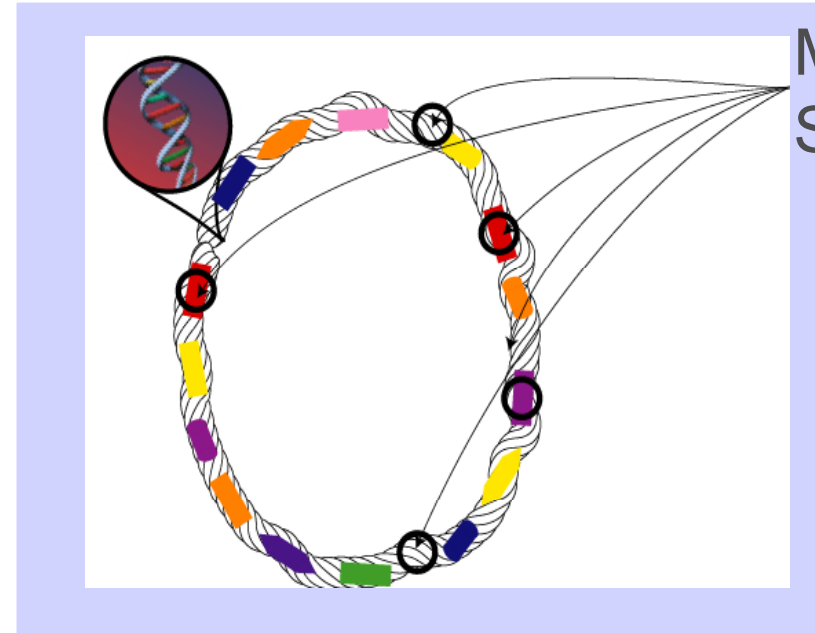
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R&D to support ‘spiral development’



Advanced Detection Systems: autonomous for 24/7/365 ops

- detect-to-treat for wide areas
- detect-to-warn for facilities
- det'n systems for food monitoring



Bioassays

- additional agents
- multiple signatures for very low f.p.
- inexpensive, highly multiplexed assays
- novel assays for engrd/unknown agents



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The Creation of BioSecurity and BioWatch

Department of Homeland Security

Lead the unified national effort to secure America. We will prevent and deter terrorist attacks and protect against and respond to threats and hazards to the nation. We will ensure safe and secure borders, welcome lawful immigrants and visitors, and promote the free-flow of commerce.



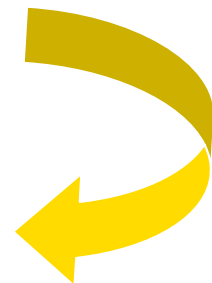
DHS Science and Technology Directorate

Conduct, stimulate, and enable research, development, test, evaluation, and timely transition of homeland security capabilities to federal, state, and local operational end-users.



BioSecurity Program

To Operationally Sustain, Enhance, and Maintain the National 24/7 Operational Ability to Detect, Mitigate, Respond and Recover from a Bioterrorist Event



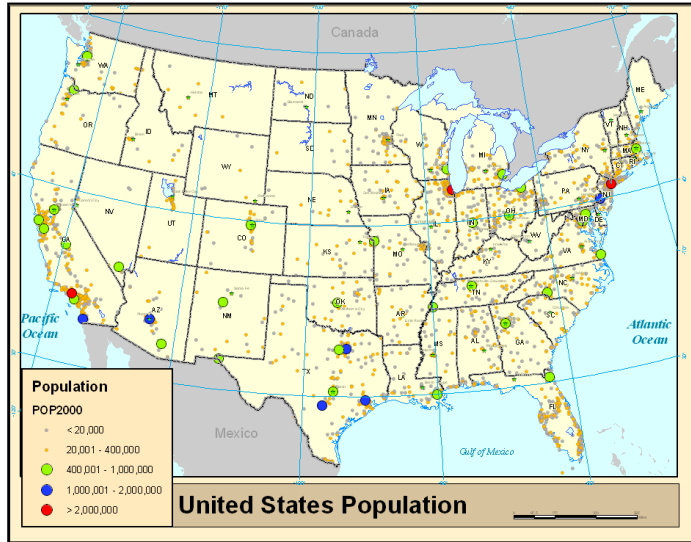
BioWatch



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DHS environmental monitoring operations

BioWatch
>30
Metropolitan
Areas
24x7 CONOP
> Jan 2003



Olympic
Winter Games
BASIS
*** CONOPS**

9/11 & NCR
Operations
24x7 CONOP
> Oct 2001



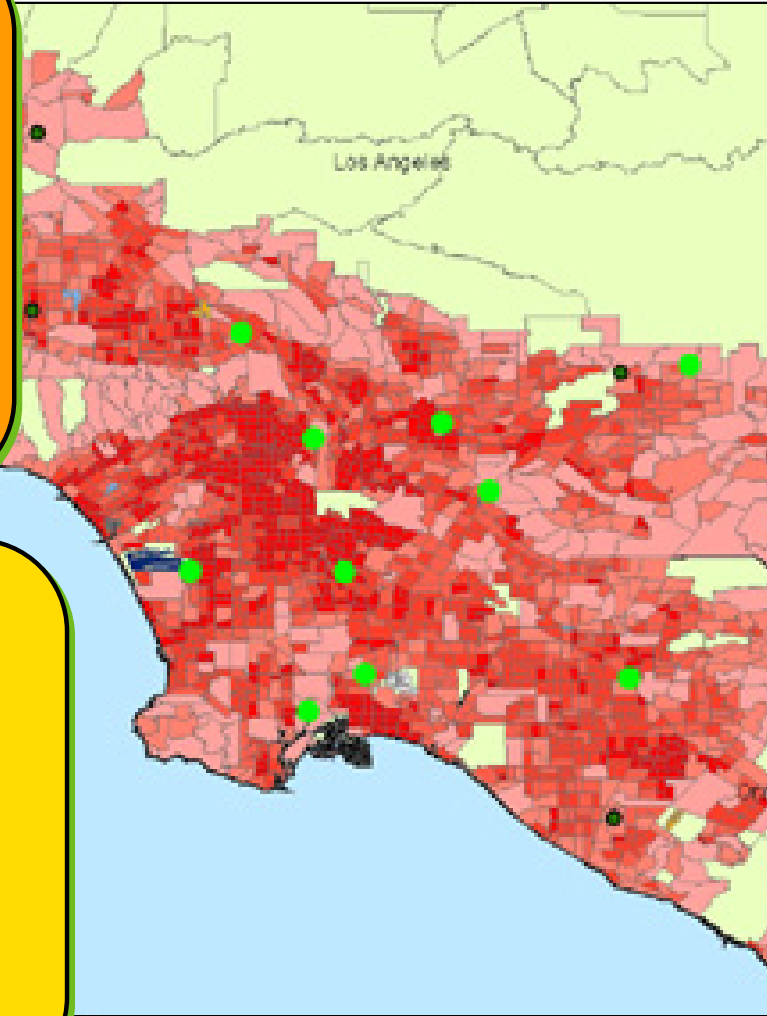
9/11
Commemorative
Ceremonies
Fall 2002
Code Orange
2003
G8 Spring 2004



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BioWatch Components

Network of Aerosol Collectors



Sample Processing

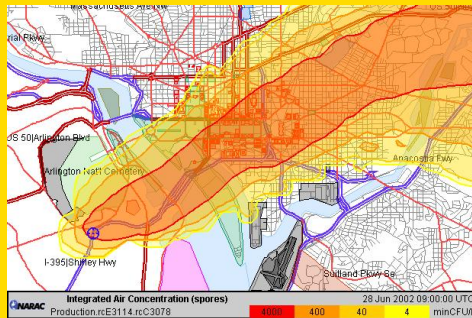
Local LRNs



Central LRN LAB (LLNL)



Consequence Management



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BioWatch- Mission Critical Aspects

Mission Critical Aspects of

BioWatch Program

- **Maintain Integrity of Day-to-Day Operations (30+ jurisdictions)**
- **National Security Special Events (NSSE), Special Events and Code Orange Alerts**
- **Generation-2 Enhancement**
- **BioWatch Exercise and Evaluation Program (BWEEP)**
- **Expansion**
- **Enhancement**



All Successfully Completed With...

- **Zero System Degradation**
- **Zero False Positives**



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Chemical Countermeasures Portfolio



Chem Countermeasures Mission and Objectives

Mission Statement

Enhance the nation's capability to anticipate, prevent, protect from, respond to and recover from chemical threat attacks through interagency leadership and conduct of innovative research, development, and technology transition

Strategic Objectives

- Enable comprehensive understanding and analyses of chemical threats in the domestic domain
- Develop pre-event assessment, discovery, and interdiction capabilities for chemical threats
- Develop capability for warning, notification, and timely analysis of chemical attack
- Optimize technology and process for recovery from chemical attacks
- Enhance the capability to identify chemical attack sources



Chemical Countermeasures Program

Guidance

- Resources (FY06) have been allocated for R&D on non-traditional agent (NTA) detectors, and additional resources allocated for laser spectroscopy and other NTA detection concepts, and for a live NTA testing facility at Aberdeen Proving Grounds.
- The portfolio will de-emphasize food and water security, pending determinations made by the chemical portfolio's assessment of the role of DHS in both areas.
- The portfolio will emphasize identification of candidate technologies for Rapid Prototyping.
- ***Response/recovery roles:***
 - ***Chem CM will develop responder detection technologies and contaminated site assessment capabilities.***
 - ***Chem CM will enable chem forensics and environmental chem lab response network through support of methods development, proficiency testing, and some infrastructure.***
 - ***Chem CM will participate in development, testing, and guidance in use of decontamination technologies. Particularly, Chem CM has received guidance to maintain strong hand in NTA countermeasures development***



Requirement

First responder detection

Chem detection in subways

Chem detection in shopping mall HVAC systems

Highway tunnel HVAC monitoring systems

Chem material detection in food processing

Chem water monitoring system

HVAC monitoring for CWAs and TICs

Chem weigh station portal monitors

Fixed point and standoff chem detection systems

Programs Addressing Requirement

Handheld CWA/TIC Detector (LACIS)

PROTECT (upgrade with Facility Chem Monitor ARFCAM)

ARFCAM

ARFCAM (possibly modified for environment)

FDA, USDA mission

EPA mission

ARFCAM

Partially addressed by “Closed Container Monitor”

ARFCAM, LACIS, and Standoff Detn, UAV survey (initiate FY08-09)



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Countermeasures Test Beds



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Countermeasures Test Bed (CMTB)

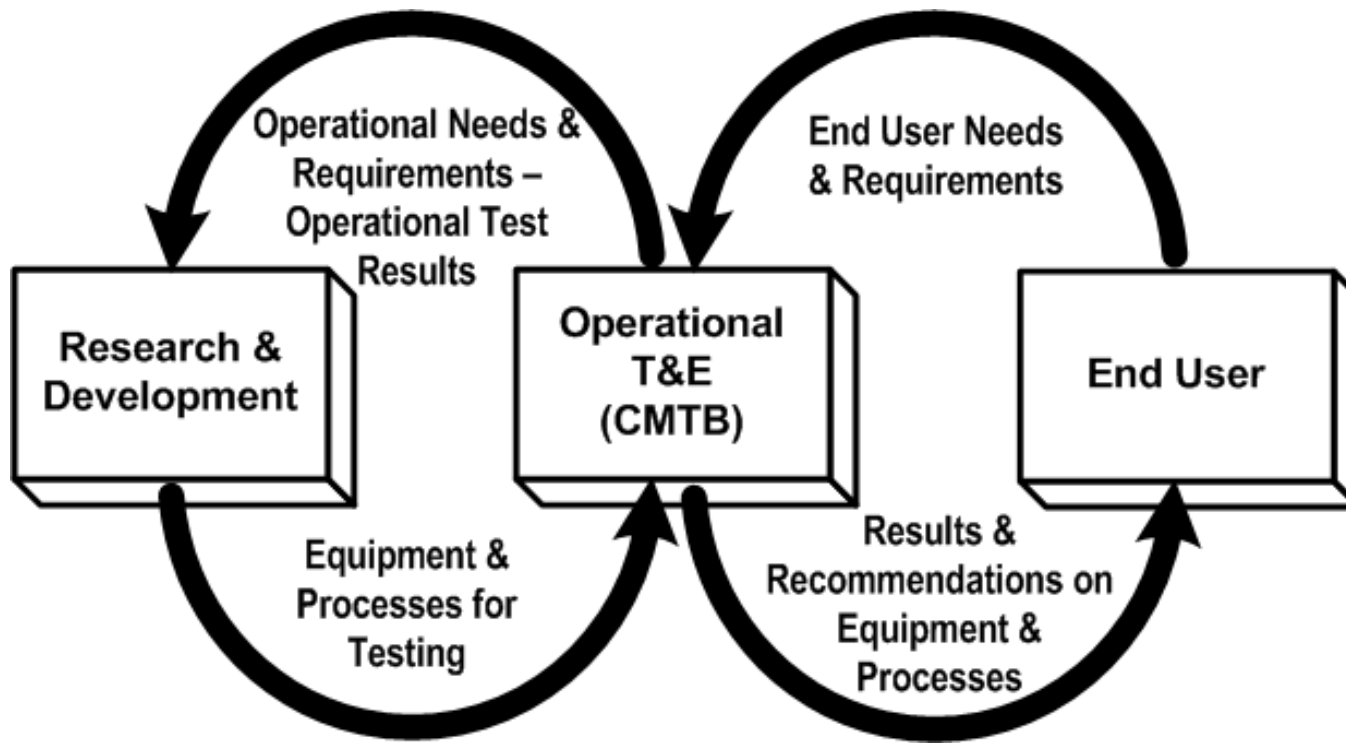
Vision

To serve as the field testing capability for evaluating security-related countermeasures in operational environments, thereby facilitating their rapid transition to federal, state, and local operational end-users.



Program Mission

- More-effectively prevent an act of WMD terrorism by enabling the end-user community to detect, deter, interdict, and respond to a WMD Threat
- OT&E plays a critical role in the development and effective transition of equipment, technology, and processes from the R&D community to routine use by the end-user



What are we doing?

- **Evaluating and assessing the role of threat detection technologies to protect critical elements of an inter-modal transportation system**
 - ***Detection systems evaluated in real-world environments in conjunction with operational end-users***
- **Developing and exercising appropriate concept of operations (ConOps) and response protocols to transition technology to user-community**
- **Integrating lessons learned into recommendations for domestic defense architectures**



CMTB is a Partnership

■ DHS Organizations

- ❖ **Science & Technology Directorate**
 - Environmental Measurements Lab (NYC)
- ❖ **Borders & Transportation Directorate**
 - Customs & Border Protection
 - United States Coast Guard
 - United States Secret Service

■ Regional, State, and Local

- ❖ Port Authority of New York and New Jersey
- ❖ New Jersey State Police

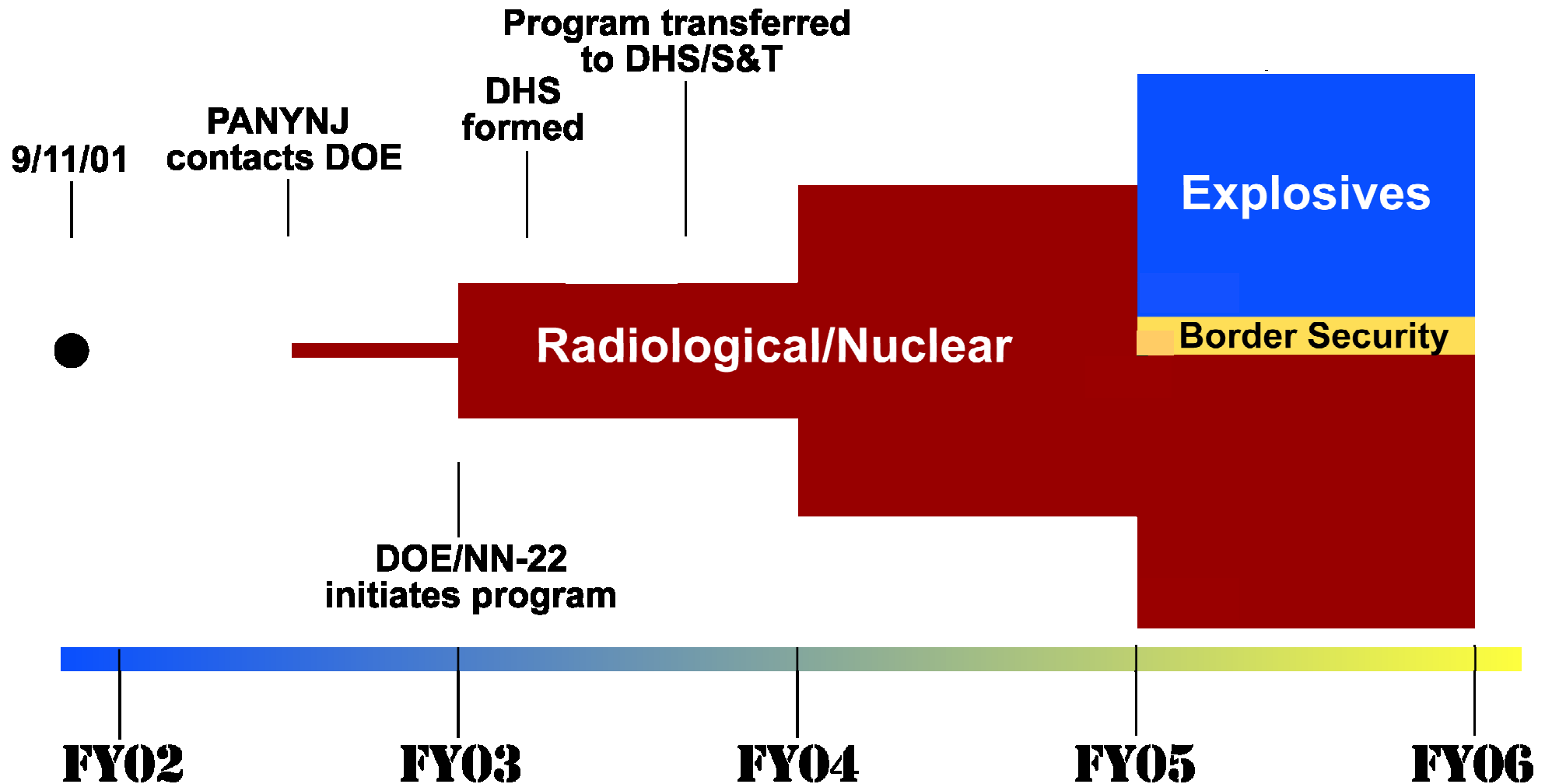
■ National Labs

- ❖ Brookhaven National Lab
- ❖ Lawrence Livermore National Lab
- ❖ Los Alamos National Lab
- ❖ Oak Ridge National Lab
- ❖ Pacific Northwest National Lab
- ❖ Sandia National Lab
- ❖ Savannah River National Lab

■ Private Commercial Entities and Facility Operators



CMTB scope and funding are expanding to threats other than Radiological/Nuclear



We work in all modes of transportation

- **Aviation**

- Airport cargo handling
- Pedestrian traffic

- **Marine**

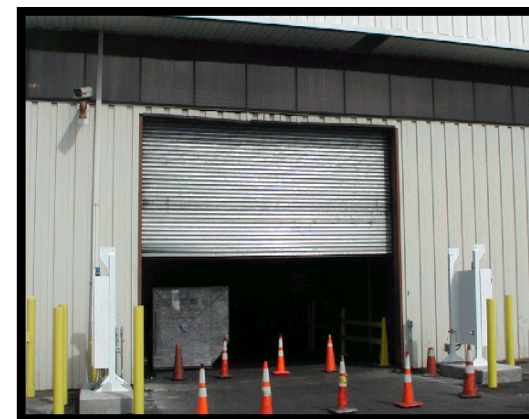
- Containers on trucks leaving port
- Containers being unloaded
- Boats in harbor

- **Roadways**

- Commercial & private vehicles at tunnels
- Commercial & private vehicles at bridges
- Commercial & private vehicles at variable locations

- **Railways**

- *Rail cargo, Rail Passenger, Mass transit*



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QUESTIONS ???



“Can I call you back? We’re in the middle of transitioning from tree-frog allergies to bioterrorism.”



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