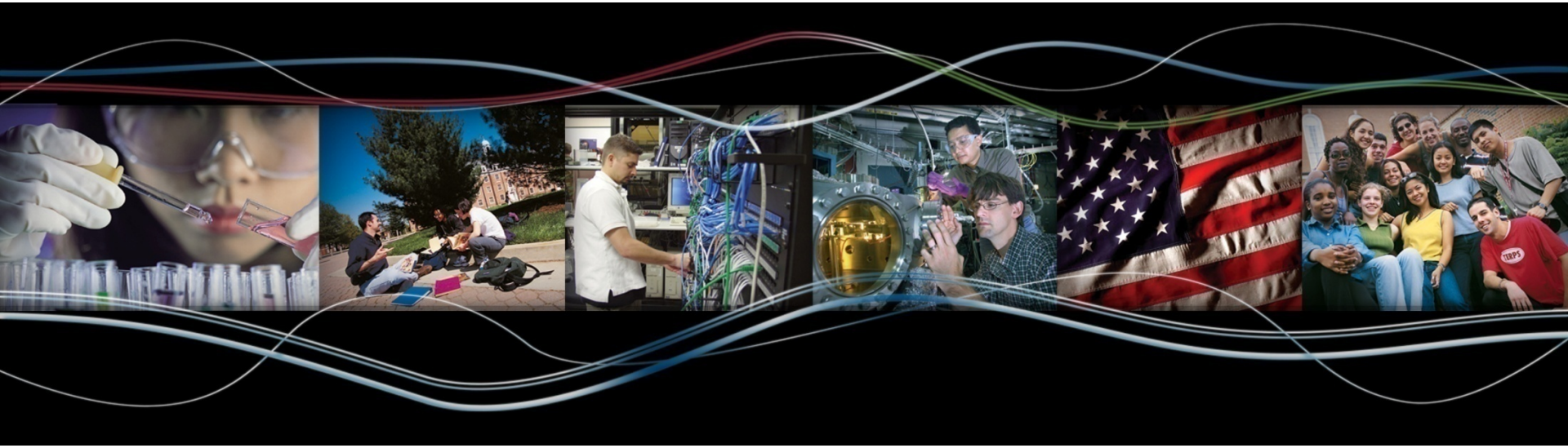
S&T Office of University Programs
4th Annual DHS University Network Summit



Stephanie Willett

Office of University Programs
Science and Technology Directorate

March 12, 2010

Homeland Security

S&T Office of University Programs

- Authorization 2002 Homeland Security Act
  - Engages the academic community to conduct research and analysis, and provide education and training to enhance DHS homeland security capabilities.
    - Programmatic Thrusts
      - Centers of Excellence
      - Education Programs
      - Minority Serving Institutions

Homeland Security

Requirements[1] for an S&T Directorate RDT&E Workforce

- **To fulfill its enduring RDT&E mission, the S&T Directorate will require:**
  - **A mission-focused workforce to support application of new technology by DHS operational components (E.g. IPT requirements)**
  - **An experienced and enduring scientific and technical workforce[2] to support long term RDT&E in specific technical areas required by these operational components,**
  - **An agile, multidisciplinary workforce to address continually evolving, technically complex threats to homeland security (e.g. terrorism, cybercrimes, domestic chemical, biological, radiological, nuclear, and explosives)**
  - **An experienced program management capability within the Science and Technology Directorate* to organize and direct all of the above.**

1 **Per: HSA2002 Sec. 302 ibid.**
2 **Per: FAR 35.017 (2), (4) and FAR 17.503 (a), (a) (2), (b) (3)**

Homeland Security

S&T has 17 Priority Research and Education Areas

1. **Explosives Detection, Mitigation and Response**
2. **Social, Behavioral, and Economic Sciences**
3. **Risk and Decision Sciences**
4. **Human Factors Aspects of Technology**
5. **Chemical Threats and Countermeasures**
6. **Biological Threats and Countermeasures**
7. **Food and Agriculture Security**
8. **Transportation Security**
9. **Border Security**
10. **Immigration Studies**
11. **Maritime and Port Security**
12. **Infrastructure Protection**
13. **Natural Disasters and Related Geophysical Studies**
14. **Emergency Preparedness and Response**
15. **Communications and Interoperability**
16. **Advanced Data Analysis and Visualization**
17. **Community, Commerce and Infrastructure Resilience**

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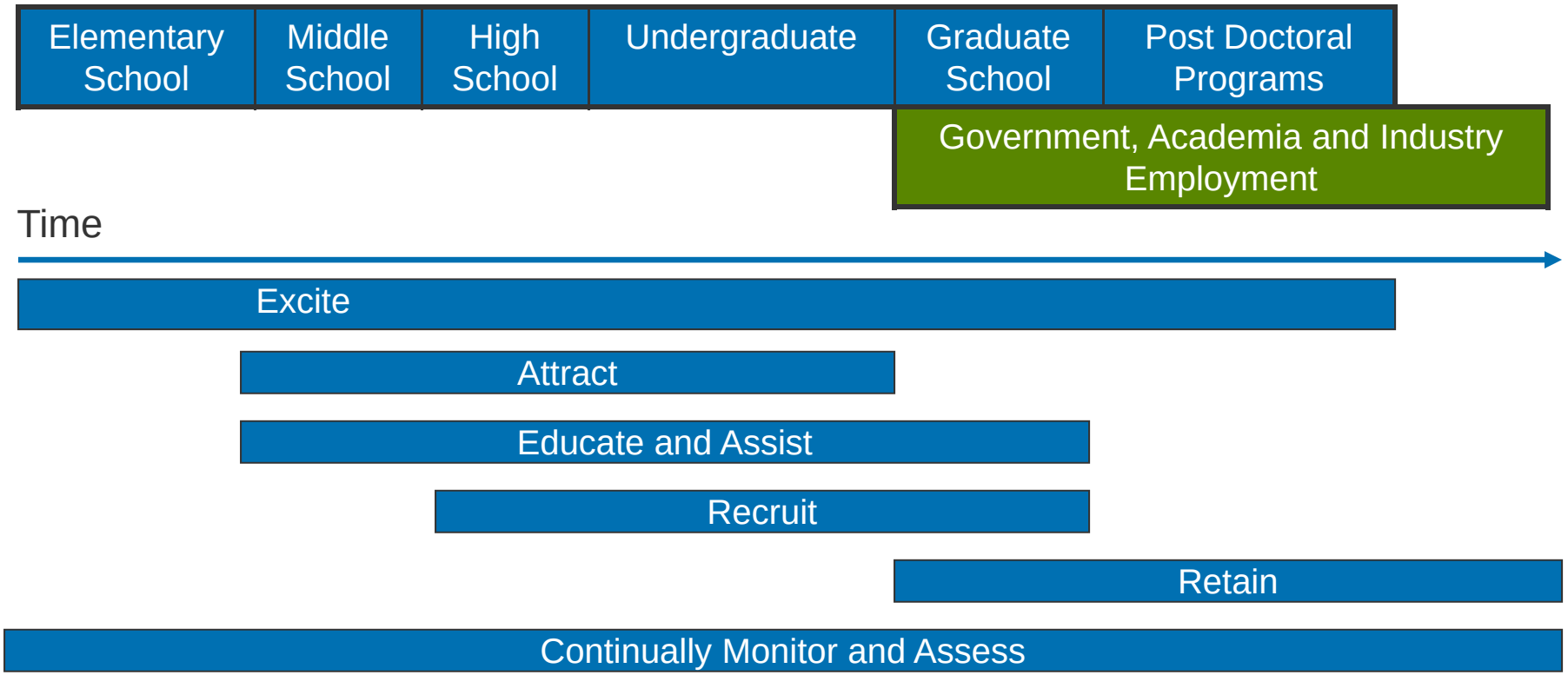
National Academies' STEM Workforce Development Strategy



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S&T Education Programs

Mission	Partners
Develop the science, technological, engineering and mathematics instruction and learning capabilities to ensure the U.S. is the leader in counter-terrorism, disaster preparedness and security science and technology.	Federal Research Institutions DHS Centers of Excellence Other Academic Institutions Private Partnerships
Goals	**Customers**
◆ Enhance development of students who wish to study in homeland security related STEM fields ◆Promote DHS-related curriculum and programs to a wider community of academic and learning institutions and research facilities ◆Develop a diverse and well-trained scientific and technical workforce for the homeland security community	DHS K-20 Educational Community DHS Laboratories DHS Centers of Excellence National Laboratories State Homeland Security Agencies

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S&T Education Programs

- Individual Scholarships and Fellowships Program
- Career Development Grants to Institutions
- DHS S&T Summer Internship Program
- K-12 STEM Education Initiatives
- National Defense University

Homeland Security

Overview: Minority Serving Institutions (MSI) Programs

Goal:

Help ensure that the face of America is reflected in the future Homeland Security science and technology work force.

Objectives:

- **Develop HS-STEM* capacity at interested MSIs**
- **Leverage existing HS-STEM capabilities at MSIs**
- **Provide Scholarships and Fellowships to MSIs for homeland security students**
- **Provide homeland security career pathways to MSI students**

Programs:

- **Scientific Leadership Award Grants**
  - **Community College**
  - **Bachelors**
  - **Graduate**
- **Summer Research Teams Program**
  - **MSI Faculty and students teams at COEs**
  - **Potential for follow-on funding**

*** HS-STEM = Homeland Security Science, Technology, Engineering and Mathematics**

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Student Service Requirement

- Scholarship and Fellowship Recipients
- Career Development Grant Recipients

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Service Requirement Fulfillment – Where?

- Anywhere in DHS - R&D, T&E, Policy, Mission Support
  - DHS currently employs 225,000 people
- http://www.dhs.gov/xabout/careers/
  - DHS Supported labs and FFRDCs
    - http://www.dhs.gov/files/labs/
    - FFRDCs - HSSAI and HSSEDI
    - http://www.dhs.gov/ynews/releases/pr_1236283228562.shtm

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HS-STEM Career Workforce To Support S&T's Enduring RDT&E Mission – National Labs Component

- Based on current DHS programs, maintaining an enduring DHS RDT&E Career Workforce will require:
  - 80-160 new HS-STEM graduates/year
  - Experiential education in multidisciplinary DHS RDT&E (Lab Internships)
  - Graduate placement in DHS and the Government Laboratories, which perform the majority of S&T RDT&E and provide the continuity in DHS programs that is needed for a HS-STEM career development.
  - Developing an HS-STEM Career Development MOU with DOE to identify continuing HS-STEM career needs and to place graduates.

Homeland Security

Important Links

A list of important references and information on programs the office of University Programs works closely with.

- Office of University Programs: http://www.dhs.gov/xres/programs/editorial_0555.shtm
- Summer Internship Program: http://www.orau.gov/dhsinternships/
- Scholarship and Fellowship Program: http://www.orau.gov/dhsed/
- Summer Research Team Program (MSI): http://www.orau.gov/dhsfaculty/
- HS-STEM Career Development Grants: www.grants.gov
- MSI Scientific Leadership Awards: www.grants.gov
- University Programs External Link: www.hsuniversityprograms.org

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References

- DHS Office of University Programs
  - http://www.dhs.gov/files/programs/editorial_0555.shtm
  - http://hsuniversityprograms.org/
- DHS S&T Basic Research Focus Areas
  - http://www.dhs.gov/xlibrary/assets/st_basic_research_focus_areas_may_2009.pdf
- DHS S&T High Priority Technology Needs
  - http://www.dhs.gov/xlibrary/assets/st_basic_research_focus_areas_may_2009.pdf
- COE University Network Site
  - http://www.hsuniversityprograms.org/

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Back-up Slides

Homeland Security

COE Alignment with S&T DIVISIONS

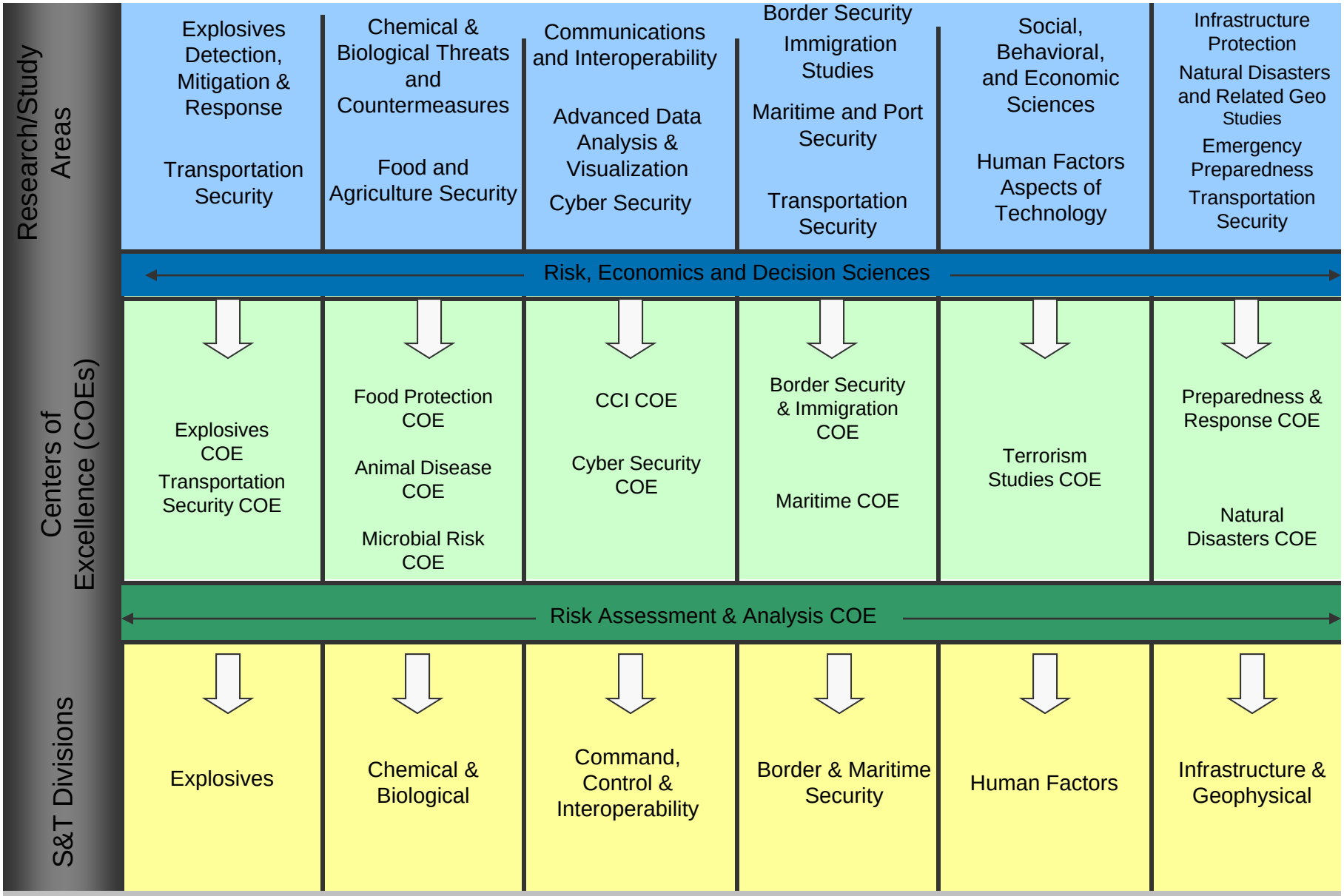
Explosives	Chemical/Biological	Command, Control & Interoperability	Borders/Maritime	Human Factors	Infrastructure/ Geophysical
COE for Explosives Detection, Mitigation & Response	National Center for Food Protection and Defense — A Homeland Security Center of Excellence	***CCI Center***	***COE for Border Security & Immigration***	START	PACER — A Homeland Security Center of Excellence
COE for Transportation Security	FAZD Center — National Center for Foreign Animal and Zoonotic Disease Defense	***COE for Transportation Security***	***COE for Maritime, Island & Remote/Extreme Environment Security***		***COE for Natural Disasters, Coastal Infrastructure & Emergency Management***
	CAMRA — Center for Advancing Microbial Risk Assessment		***COE for Transportation Security***		***COE for Transportation Security***
	PACER — A Homeland Security Center of Excellence				

Risk, Economics and Operations Analysis

Risk Sciences Branch & Operations Analysis Division

CREATE Homeland Security Center

University Programs Education & Research Pipeline



CREATE
HOMELAND SECURITY CENTER

Mission	Partners
To evaluate the risks, costs, and consequences of terrorism, and provide decision support tools to protect the Nation	Lead: University of Southern California Arizona State Univ., Carnegie Mellon Univ., Elizabeth City State Univ.*, New York Univ., North Carolina State Univ., Penn State Univ., Univ. of Illinois–Urbana-Champaign, Univ. of Texas–Dallas., Univ. of Wisconsin–Madison * Minority Serving Institutions
Impact and Relevance ▪ Models and tools for generating random security/protection plans that serve as a strong terrorism deterrent, while achieving a sufficient use of security patrol ▪ Support of the Risk Assessments of the National Bio-defense Analysis and Countermeasures Office (NBACC) ▪ Risk-based Resource Allocation for California Buffer Zone Protection Program (BZPP) Funds	**Customers** DHS Science and Technology Chem-Bio National Bio-defense Analysis and Countermeasures Center (NBACC)/ Customs and Border Protection (CBP) Immigration and Customs Enforcement (ICE) Transportation Security Agency (TSA) DHS Office of Infrastructure Protection (OIP) State Homeland Security Agencies Port Authorities

Homeland Security

USC

FAZD CENTER

NATIONAL CENTER FOR FOREIGN ANIMAL AND ZOONOTIC DISEASE DEFENSE

Award Date: June 2004

Mission

To protect against the introduction of high-consequence foreign animal and zoonotic diseases into the United States, with an emphasis on prevention, surveillance, intervention and recovery

Partners

Lead: Texas A&M University

Huston-Tillotson Univ.*, Univ. of California–Davis, Univ. of Maryland, Univ. of Southern California, Univ. of Texas Medical Branch, Univ. of Wisconsin–Madison

* Minority Serving Institutions

Impact and Relevance

- Developing new methods for rapid and accurate detection of foot and mouth disease, rift valley fever, and avian influenza
- Developing new vaccines and antiviral agents to protect animals from introduced diseases
- Developing approaches to curtail disease spread

Customers

DHS Science and Technology Directorate

DHS Office of Infrastructure Protection

DHS Office of Health Affairs

USDA, DOD, and OSTP (FAD-T)

Chief Veterinary Officers

State Departments of Agriculture

Agriculture Industry

Homeland Security

NATIONAL CENTER FOR
FOOD PROTECTION AND DEFENSE
A HOMELAND SECURITY CENTER OF EXCELLENCE

Award Date: June 2004

Mission

To defend the safety of the food system from pre-farm inputs through consumption by establishing best practices, developing new tools and attracting new researchers to prevent, manage and respond to/recover from food contamination events

Partners

Lead: University of Minnesota

Cornell Univ., Georgia Institute of Technology, Illinois Institute of Technology, *New Mexico State Univ.**, North Carolina State Univ., *North Carolina A&T State Univ.**, North Dakota State Univ., Michigan State Univ., Rutgers Univ., Purdue Univ., Saint Joseph's Univ., Texas A&M Univ., *Tuskegee Univ.**, Univ. of Arkansas, Univ. of California–Davis, Univ. of Illinois–Urbana-Champaign, Univ. of Maryland, Univ. of Missouri–Columbia, Univ. of South Carolina, Univ. of Southern Mississippi, Univ. of Tennessee–Knoxville, Univ. of Wisconsin–Madison, Univ. of Wisconsin–Milwaukee, Univ. of Wisconsin–River Falls, Wayne State Univ.

* *Minority Serving Institutions*

Impact and Relevance

- Developed prototype food event modeling system
- Developed initial realistic decontamination protocols involving surrogate agents and food matrices
- Developed new risk communication approaches minimizing potential impact of food contamination events

Customers

DHS Science and Technology Directorate

DHS Office of Infrastructure Protection

DHS Office of Health Affairs

USDA, FDA, CDC and EPA

State and Local Food System Agencies

Food and Agriculture Private Sector

Homeland Security

UNIVERSITY OF MINNESOTA

START

Mission

To provide strategies for intervention of terrorists and terrorist organizations, and to strengthen the resilience of US citizens to terrorist attacks by generating advances in scientific-based knowledge on the human causes and consequences of terrorism, and integrating these findings into educational programs for the for homeland security policymakers and practitioners of today and tomorrow

Partners

Lead: University of Maryland

Brandeis Univ., Bryn Mawr College, Dartmouth Medical School, Eastern Michigan Univ., John Jay College, CUNY*, Massachusetts Institute of Technology, Michigan State Univ., Monterey Institute of International Studies, Morehouse College*, Ohio State Univ., Rutgers Univ., Stanford Univ., Tufts Univ., Univ. at Albany, Univ. of California–Irvine, Univ. of California–Los Angeles, Univ. of Colorado, Univ. of Minnesota, Univ. of Missouri–Kansas City, Univ. of New Mexico*, Univ. of Oklahoma, Univ. of Pennsylvania, Univ. of Pittsburgh Medical Center, Univ. of South Carolina, Univ. of Texas, Univ. of Wisconsin–Madison, Wellesley College, Wesleyan Univ.

* Minority Serving Institutions

Impact and Relevance

- Developing world's largest and most up-to-date database of terrorist events
- Developing tools and data on the life cycle of terrorist groups, including understanding the impact of counterterrorism interventions
- Identifying causes and indicators of individual and group radicalization
- Assessing community preparedness for terrorist events

Customers

DHS Science and Technology

DHS Office of Intelligence and Analysis

DHS Preparedness Directorate

DHS Policy Office

National Counter Terrorism Center, DNI

Federal Bureau of Investigations

State Department

Port Authority of New York and New Jersey

Homeland Security

UNIVERSITY OF MARYLAND

CAMRA
Center for Advancing Microbial Risk Assessment

Award Date: June 2004

Mission

To develop critically reviewed and interpreted sets of models, tools and information that will be used in a credible risk assessment framework to reduce or eliminate health impacts from deliberate use of biological agents of concern (BAC) as bioterrorists agents in the indoor and outdoor environment

Partners

Lead: Michigan Statue University

Drexel Univ. (co-lead), Univ. of Michigan, Univ. of Arizona, Northern Arizona Univ.*, Carnegie-Mellon Univ., Univ. of California-Berkeley

* Minority Serving Institutions

Impact and Relevance

- Provide scientific basis for assessing risks of natural and malicious occurrences of infectious agents
- Provide scientific basis for assessing “how clean is clean”

Customers

DHS Science and Technology Directorate

US EPA - National Homeland Security Research Center

National Bio-defense Analysis and Countermeasures Center

Homeland Security

MICHIGAN STATE UNIVERSITY

PACER
A HOMELAND SECURITY CENTER OF EXCELLENCE

Award Date: August 2006

Mission

Improve the Nation's preparedness in the event of a high consequence natural or man-made disaster, and develop best practices to alleviate the event's effects

Partners

Lead: Johns Hopkins University

Florida A&M Univ.*, Florida State Univ., Jacksonville State Univ., JHU School of Advanced International Studies, JHU Applied Physics Lab, JHU School of Medicine, Loma Linda Univ., Morgan State Univ.*, Univ. at Buffalo, Univ. of Alabama–Birmingham, Univ. of Alabama–Tuscaloosa, Univ. of South Florida

* Minority Serving Institutions

Impact and Relevance

- Develop tools to assess risk readiness for catastrophic events
- Improve response capabilities of agencies and first responders by harnessing the strength of informal networks
- Identify communications and data fusion techniques to improve situational awareness and critical decision making

Customers

DHS Science and Technology

DHS Office of Infrastructure Protection

DHS Office of Health Affairs

DHS FEMA

State Homeland Security Agencies

State and Local Health Agencies

JOHNS HOPKINS UNIVERSITY

Homeland Security

COE for Border Security & Immigration

Mission

Conduct research and develop technologies, tools and advanced methods to balance immigration and commerce with effective border security

Partners

Research Co-Lead: University of Arizona
Education Co-Lead: University of Texas, El Paso*
Duke University, New Jersey Institute of Technology, North Dakota State University (NDSU), Texas A&M, University of Connecticut, University of Texas - San Antonio, Wayne State University, Research Triangle Institute International, University of California Irvine, University of Washington, West Virginia University, University of Minnesota, New Mexico State University,* Penn State, UT – Pan American*

* Minority Serving Institutions

Impact and Relevance

Assess threats and vulnerabilities at and between ports of entry

Improve surveillance and screening of people and goods

Develop analytical frameworks, assess immigration policy and policy alternatives

Enhance policy and law enforcement

Customers

DHS Science and Technology
Customs and Border Protection
Immigration and Customs Enforcement
Citizenship and Immigration Services
State and Local Agencies

Homeland Security

COE for Maritime Island & Extreme/Remote Environmental Security

Mission

Conduct research and develop technologies, tools and advanced methods to strengthen maritime domain awareness and safeguard populations and properties unique to U.S. island, remote/extreme environments

Partners

Co-Lead: Stevens Institute of Technology
Co-Lead: University of Hawaii
University of Alaska at Fairbanks*, MIT, University of Miami, Monmouth University, University of Puerto Rico at Mayaguez*, Rutgers University

* Minority Serving Institutions

Impact and Relevance

- Enhance maritime domain awareness
- Protect critical infrastructure in remote and extreme areas
- Enhance response and recovery plans for natural disaster threats to island communities
- Design resilient port infrastructures
- Assess Global Policies influencing maritime security and coastal safety

Customers

DHS Science and Technology
U.S. Coast Guard
FEMA
Customs and Border Protection
DHS Office of Infrastructure Protection
State Security Agencies

Homeland Security

COE for Natural Disasters, Coastal Infrastructure & Emergency Management

Mission

Reduce loss of life or injury and lessen damages to the built and natural environment by advancing the understanding of hazards and hazard resilience, transferring that knowledge into action, and developing educational curricula focused on natural disasters

Partners

Research Co-Lead: University of North Carolina at Chapel Hill
Education Co-Lead: Jackson State University*

Alcorn State University*, California Polytechnic State University - San Luis Obispo, USACE Engineer Research and Development Center, Georgia State University, Johnson C. Smith University*, Louisiana State University, Mississippi State University, Mississippi Valley State University*, North Carolina State University, Oklahoma University, Rensselaer Polytechnic Institute, Rice University, South Carolina State University*, Tougaloo College*, Texas Southern University*, Tulane University, University of Delaware, University of Houston, University of North Carolina at Charlotte, University of Texas - Dallas

* Minority Serving Institutions

Impact and Relevance

- Reduce the impact of future coastal hazards and disasters
- Protect susceptible infrastructures
- Protect populations
- Improve pre-event communication
- Improve recovery outcomes
- Enhance critical supply chain resiliency

Customers

DHS Science & Technology
FEMA
DHS Office of Infrastructure Protection
U.S. Coast Guard
State Emergency Management Agencies
First Responders
NOAA, USGS, USACE

Homeland Security

COE for National Transportation Security

Mission

To conduct research and education activities, and to develop and provide professional security training, including the training of transportation employees and transportation professionals

Partners

Research Lead: University of Connecticut
Education Lead: Tougaloo College*
Petrochemical Lead: Texas Southern University*
University of Arkansas, Long Island University, Rutgers University, San Jose State University

* Minority Serving Institutions

Impact and Relevance

- Develop research leading improvements in transportation infrastructure resilience
- Improve abilities to detect threats to transportation infrastructure
- Develop long-term strategy for transportation security research
- Develop education and training baselines for transportation security geared towards transit employees and professionals

Customers

DHS Science and Technology
DHS Transportation Security Administration (TSA)
DHS Office of Infrastructure Protection (OIP)
Ports
Federal and state law enforcement agencies
Federal and state transportation agencies

Homeland Security

COE for Explosives Detection, Mitigation & Response

Mission

To prevent the catastrophic damage to U.S. society that can be caused by explosive attack. Coordinate with industry and DOE National Laboratories to transition basic research into the field of Homeland Security

Partners

Research Co-Lead: Northeastern University
Education Co-Lead: University of Rhode Island

Boston University, California Institute of Technology, Hebrew University Jerusalem, Missouri University of S&T, New Mexico State University*, Renssalear Polytechnic Institute, Soreq, Texas Tech University, Tufts University, University of Puerto Rico- Mayaguez*, Washington State University, Woods Hole Oceanographic Institute

* Minority Serving Institutions

Impact and Relevance

- Characterize Home Made Explosives
- Examine advanced concepts for wave-based and chemical-based sensing
- Examine the use of novel reconstruction and image processing algorithms
- Conduct basic research to develop novel materials and structures

Customers

DHS Science and Technology
DHS Transportation Security Administration (TSA)
DHS OIP
DHS Policy Office
State Homeland Security Agencies

Homeland Security

COE for Command, Control and Interoperability (CCI)

Mission

Explore new science and technology for collecting, managing, and analyzing complex and dynamic sources of information and the means to disseminate, share, and secure such information in support of real-time decision-making

Partners

Purdue University – Visualization Sciences and Education Co-Lead

Rutgers, the State University of New Jersey – Data Science Co-Lead

Impact and Relevance

- Efficiency: Common analytical framework for multi-source and multi-mode information
- Effectiveness: Scalable information collection, management, synthesis and analysis, and dissemination and sharing capability
- Enterprise: Federal, state, local, and tribal users supported by university, national laboratory, and multi-COE research community

Customers

DHS Science and Technology Directorate
UP Centers of Excellence
Tribal, local, state, and federal homeland security partner agencies
DHS: Office of Intelligence and Analysis, Customs and Border Protection, Immigration and Customs Enforcement, Federal Emergency Management Agency, Office of Infrastructure Protection, US Coast Guard

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