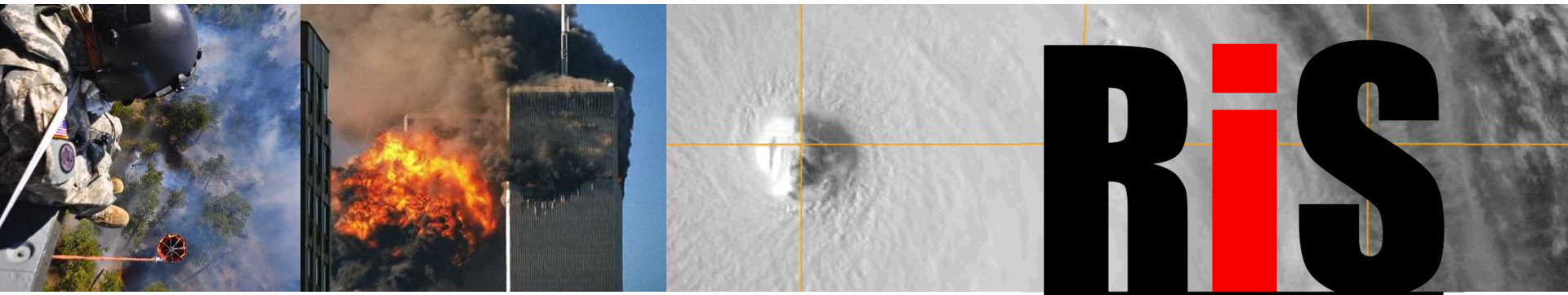


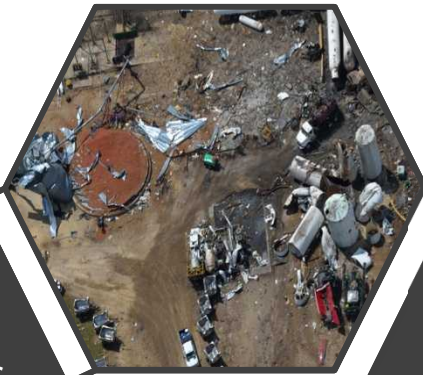
Exceptional service in the national interest



RIS

**RESILIENT
INFRASTRUCTURE
SYSTEMS**

Eric Vugrin,
Resilient Systems



Chemical Criticality
DHS/Infrastructure Security Compliance Division (ISCD)

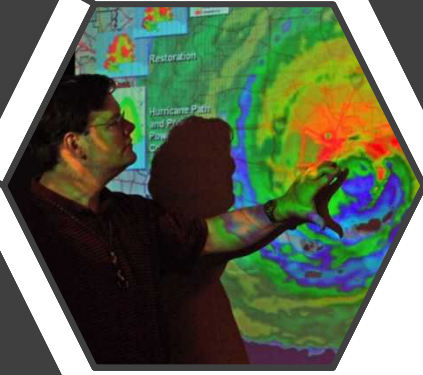
NISAC
DHS/Office of Cyber & Infrastructure Analysis (OCIA)



Drinking Water Resilience Project
DHS/Science & Technology (S&T)



Infrastructure Resilience
DHS/Science & Technology (S&T)



Resilient Cities
SNL/DOE

RiS
RESILIENT INFRASTRUCTURE SYSTEMS



Tobacco Regulatory Support
FDA/Center for Tobacco Products (CTP)

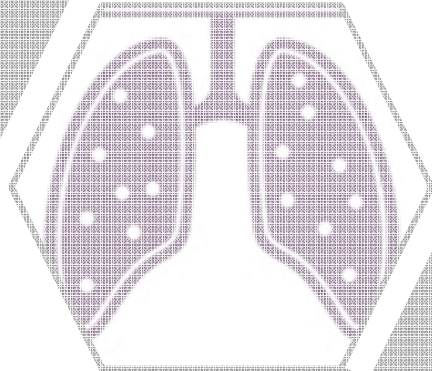
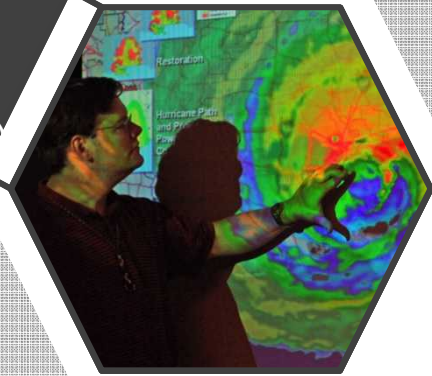


DHS/Office of Cyber & Infrastructure Analysis (OCIA)

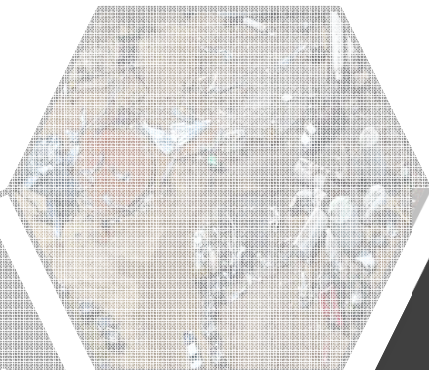
Infrastructure Resilience
DHS/Science & Technology (S&T)



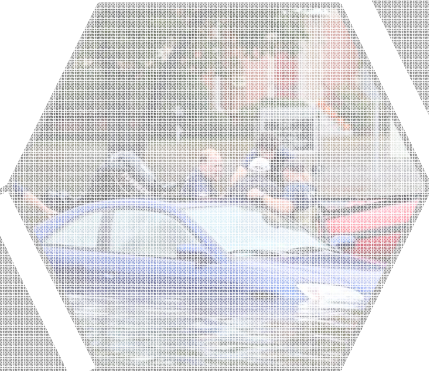
Drinking Water Resilience Project
DHS/Science & Technology (S&T)



Tobacco Regulatory Support
FDA/Center for Tobacco Products (CTP)



Chemical Criticality
DHS/Infrastructure Security Compliance Division (ISCD)



Resilient Cities
SNL/DOE

Slide 3

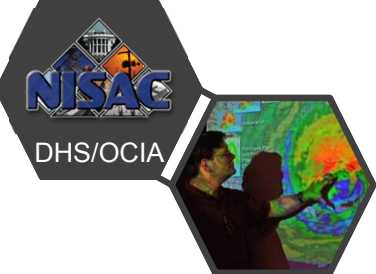
s10

I made the NISAC box a different color to signify the seminal nature of that project.

shconra, 11/9/2015



- The National Infrastructure Simulation and Analysis Center is program of the DHS Office of Infrastructure Protection, established under The USA PATRIOT Act of 2001
- Collaboration between Sandia National Laboratories and Los Alamos National Laboratory
- The NISAC program is the origination of all current RIS programs



NISAC capabilities provide a single national resource for rapid analysis of critical infrastructure interdependencies, vulnerabilities, consequences and other threats to help maintain a resilient infrastructure.

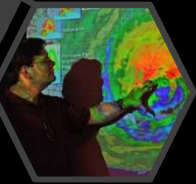


| | | | | | | | | | |
|------------------------|---------------------------|--------------------------------|----------------------------|---|-----------------------------|---------------|------------|--------------------------------|------------------------|
| CHEMICAL | COMMERCIAL FACILITIES | CRITICAL MFG | COMMUNICATIONS | DAMS | DEFENSE INDUSTRIAL BASE | EMERGENCY | ENERGY | ENERGY | FINANCIAL SERVICES |
| FOOD & AGRICULTURE | GOVERNMENT FACILITIES | HEALTHCARE & PUBLIC HEALTH | INFORMATION TECHNOLOGY | NUCLEAR REACTORS, MATERIAL, & WASTE | TRANSPORTATION SYSTEMS | | | WATER & WASTEWATER SYSTEMS | |





DHS/OCIA



Hurricane Katrina 2005

- NISAC provided – for the first time! – comprehensive situational awareness to the White House, DHS, and the federal government in a single briefing book
- A computer network was developed to assist evacuees at the Houston Astrodome to locate family members
- A computer server was used to help map safe convoy routes during the evacuation
- NISAC provided technical expertise in economic analyses and continues to lead a multi-lab effort looking at water decontamination issues in New Orleans



Slide 7

s14

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Resilient Cities provides technical expertise to help cities better address the shocks and stresses of the 21st Century.

Resilient Cities
SNL/DOE

SYSTEM-specific

CROSS-cutting

Energy



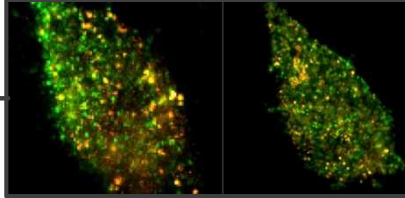
Water



Transportation



Medical



Food

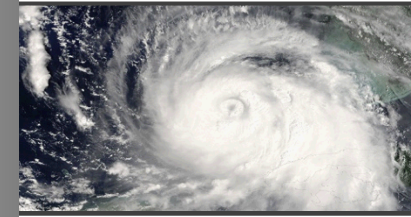


SHOCKS
 Building Disaster
 Disease Outbreak
 Earthquake
 Fire
 Flooding
 Heat Wave
 Hurricane
 Landslide
 Terrorism
 Torrential Rain
 Transit Disaster
 Violent Protest

STRESSES
 Coastal Erosion
 Crime
 Education
 Emigration
 Energy Supply/Demand
 Food Supply
 Immigration
 Inequality
 Sea Level Rise
 Sinking Lands
 Unemployment
 Waste
 Water Safety



City Critical Function Assessment



All Shocks & Stresses Risk Assessment



Human Resilience Analysis

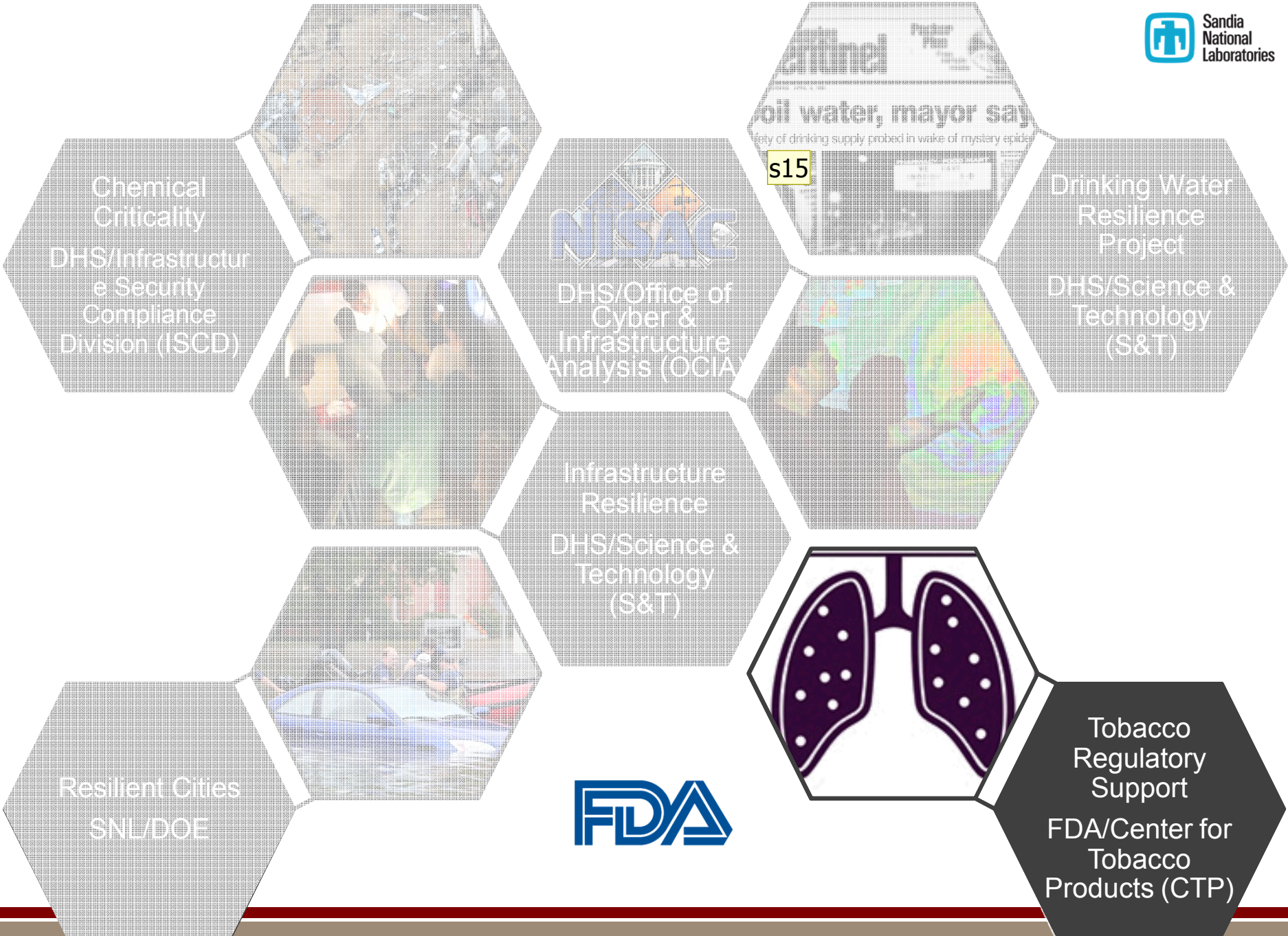


Emergency Response Exercises / Optimization

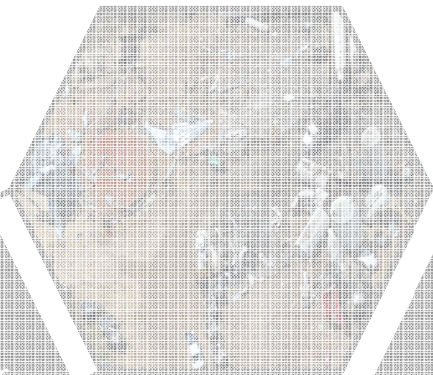


Norfolk, VA Flooding 2015

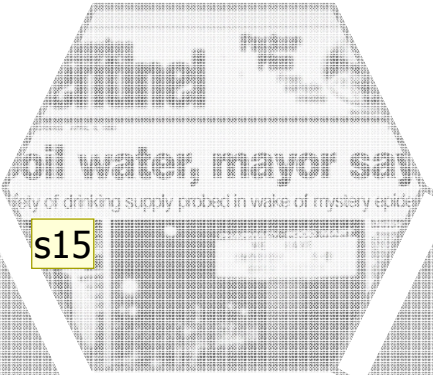
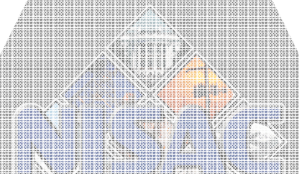
Hampton Roads area had major tidal flooding, water levels built to about six feet at high tide. Sandia worked with Norfolk as a test-bed to showcase resilience analysis capabilities for flooding.



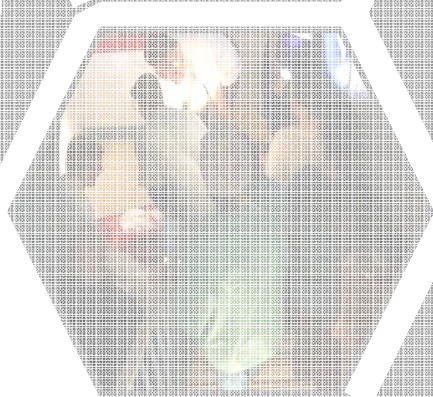
Chemical Criticality
DHS/Infrastructure Security Compliance Division (ISCD)



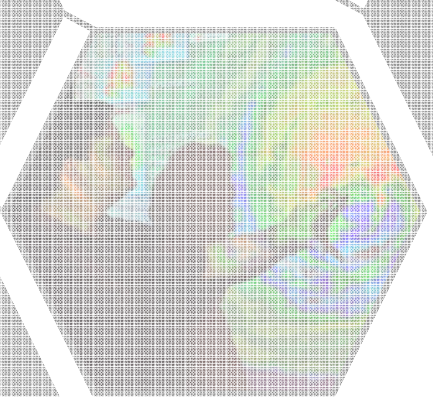
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Resilient Cities
SNL/DOE



Tobacco Regulatory Support
FDA/Center for Tobacco Products (CTP)

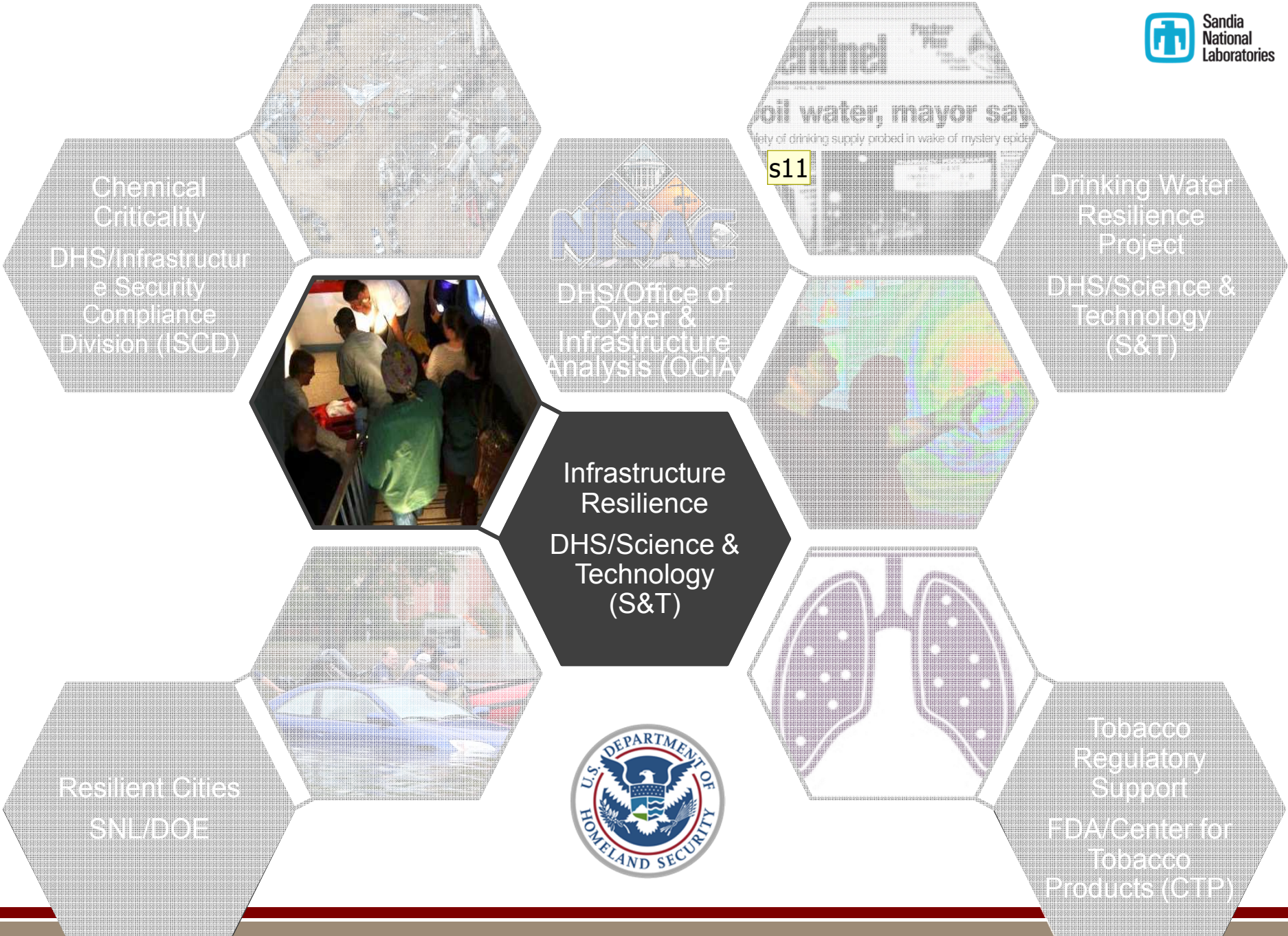


Slide 10

s15

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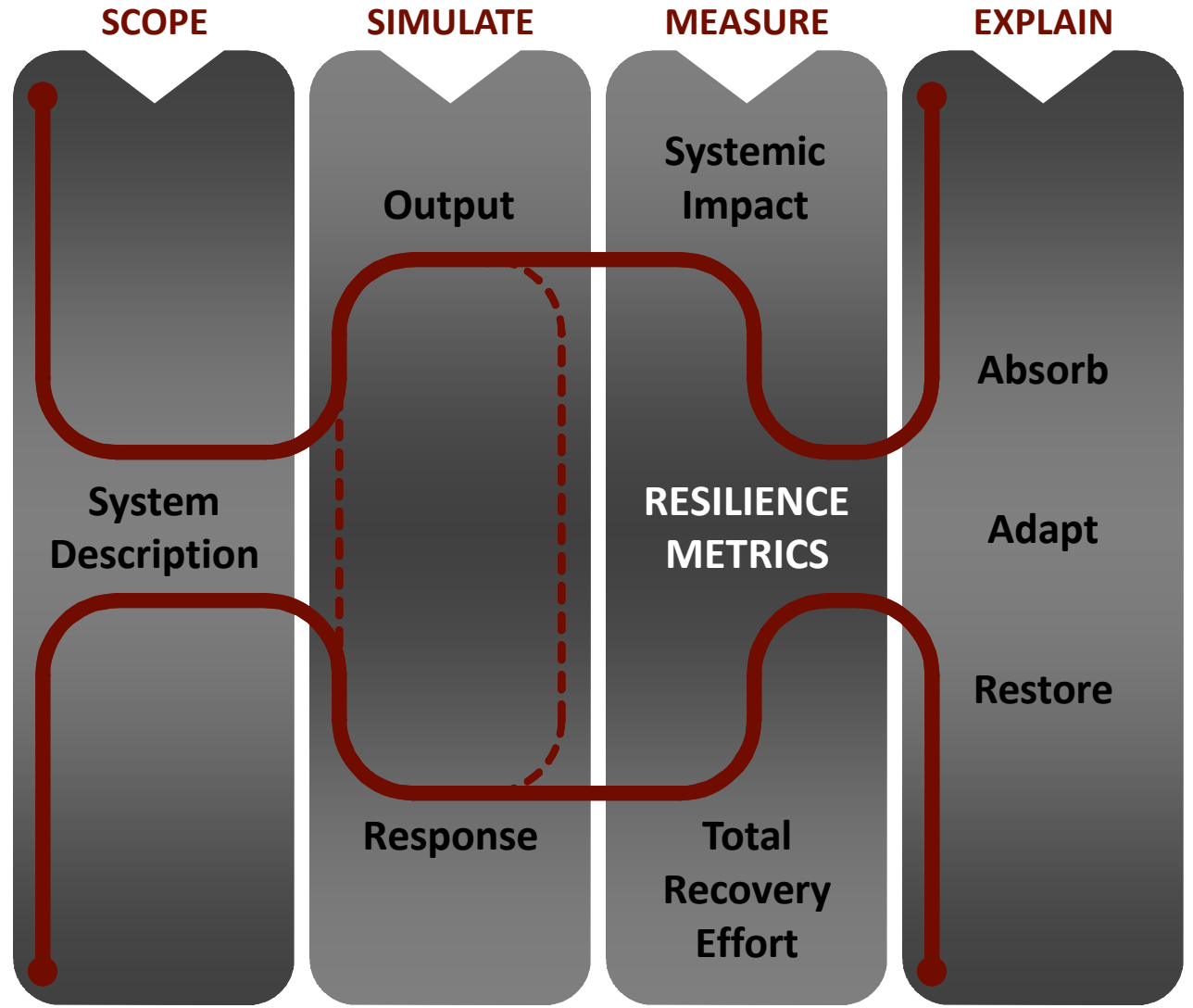
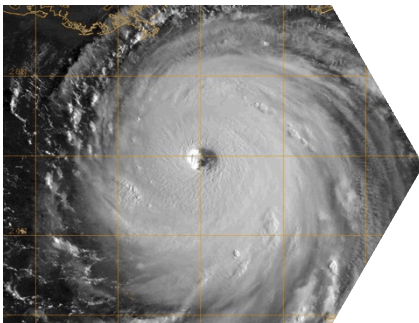


Slide 12

s11 I made the NISAC box a different color to signify the seminal nature of that project.
shconra, 11/9/2015

Infrastructure Resilience Analysis Methodology provides a Quantitative approach for assessing and improving resilience.

Infrastructure Resilience DHS/S&T





Infrastructure
Resilience
DHS/S&T

Hurricane Sandy 2012

A power outage resulted in a 200 patient evacuation from NYU Langone Medical Center in New York City – Sandia developed a systems-based model called “Hospital Evacuation during Infrastructure Disruptions” to prevent a repeat scenario.