DTRA *Technical Reachback*

Technical Reachback Capabilities

DTRA Reachback provides 24/7, 365 Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) subject matter expertise, advice, and decision support capability for planning, operations, and post event analysis to: Combatant Commands (CCMDs), Office of the Secretary of Defense (OSD), Joint Staff (JS), Intelligence Community (IC) command elements, and other U.S. Government Agencies, State/Local/Tribal Governments and first responders. With over 40 subject matter experts, deep scientific analysis of technical questions regarding CBRNE hazards is provided through hazard modeling and CBRNE decision support during Real-world CBRNE events, exercises, and planning for special event support

Serves as the operations hub for Interagency Modeling and Atmospheric Assessment Center (IMAAC) events
• Atmospheric Plume Modeling
• Hazard Prediction and Assessment Capability (HPAC)
• Fallout radiation modeling
• Chemical hazard modeling
• Biological hazard modeling
• Nuclear reactor and radiological hazard modeling

• **Deployable** Reachback Support Teams (RSTs)

TECHNICAL REACHBACK

Chemical   Biological   Radiological   Nuclear   Explosives
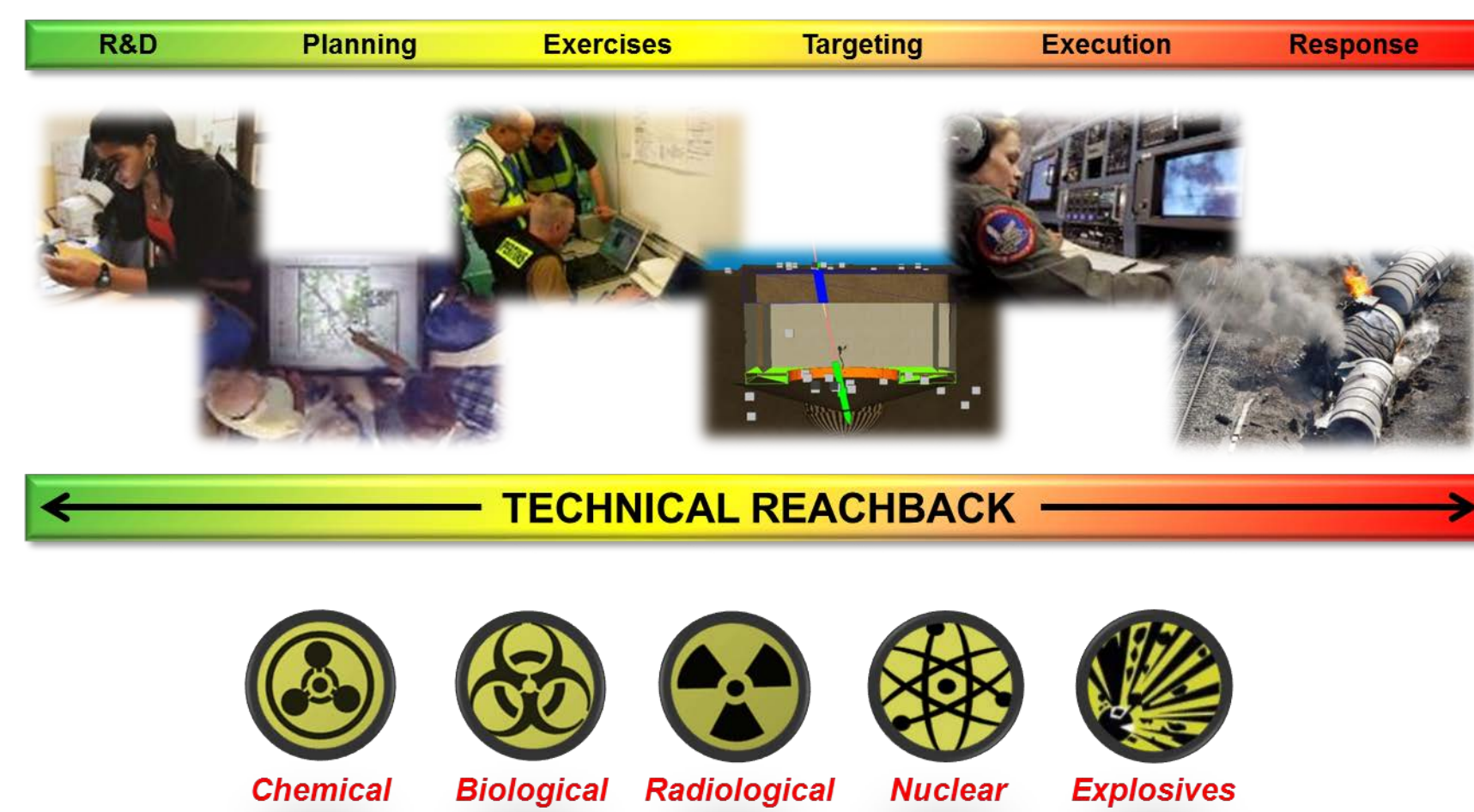
Real World Support

	Real World Events	Exercise & Training Events
DHS / National Security Significant Events (NSSE)	Presidential Inaugurations, RNC/DNC Conventions, Olympics, Super Bowls, IMAACs	National Level Exercises, TOPOFF
NORTHCOM / NGB Civil Support Teams	Hurricane Support, Deep Water Horizon, Real-World Incidents	ARDENT SENTRY, VIGILANT SHIELD, PATRIOT GUARD, Training Exercises
SOCOM	Support of field operations	DESERT ICE, VALOR GABLE
STRATCOM		GLOBAL THUNDER, GLOBAL LIGHTNING, IMAT
CENTCOM	Operation INHERENT RESOLVE, Operation ENDURING FREEDOM	
PACOM	Fukushima Daiichi operational support	TERMINAL FURY, ULCHI FREEDOM GUARDIAN, KEY RESOLVE
EUCOM / AFRICOM	Olympics, 2014 Ebola outbreak, Odyssey Dawn	GUARDIAN SHIELD, AUSTERE CHALLENGE
SOUTHCOM		ABLE WARRIOR

Contractors / Analysts
Nuclear
• PhD - Nuclear Engineering
• MS - Nuclear Engineering
• MS - Nuclear Physics
Biology/Medical
• PhD - Biochemistry
• PhD - Cell Biology
• PhD - Virology
• PhD - Microbiology
• PhD - Epidemiology
• MS - Medical Physics
• MS - Radiation Physics/Chemistry
• MS - Bioscience
Chemistry
• PhD - Chemistry
• PhD - Environmental Chemistry/Plant Physiology
• MS - Chemical Engineering
Meteorologist
• PhD - Meteorology
• MS - Meteorology
Structures / Fluids / Mechanics / Information Technology / Other
• MCE - Structural Engineering
• PhD - Hydrology/Soil Physics
• PhD - Computational Fluid Dynamics
• PhD - Computational Fluid Mechanics
• ScD - Combustion Engineering
• MS - Mechanical Engineering
• MS - Information Systems
• MS - Systems Management
• BS - Computer Science
• BS - Operations Research
• BS - Physics

Contact Information:

DTRA Operations Center: (703) 767-2000/3;
DTRA.Belvoir.J3-7.mbx.joint-ops-center@mail.mil
DTRA.Belvoir.J3-7.mbx.joint-ops-center@mail.smil.mil

Technical Reachback: (703) 767-3445/8
dtra-reachback@mail.mil;
dtra-reachback@mail.smil.mil

Software Distribution
DTRA.Belvoir.J9.mbx.reachback-software-distribution@mail.mil

Training Support (Mobile or In-Residence)
DTRA.Belvoir.J9.mbx.ReachbackTraining@mail.mil

• Atmospheric Plume Modeling

• Probabilistic CBRN downwind hazard prediction tool that support force protection, consequence of execution, and first responder operations – ingress/egress routes and situational awareness

Model Types:
• CB Weapon or Facility
• Radiological Weapon
• Industrial Facility
• Industrial Transportation
• Nuclear Weapon or Facility Incidents
• Missile Interception

Weather Options:
• Historical
• Current Observations
• NWP Forecast
• User-defined
• Climatology

Outputs:
• Human Medical Effects
• Contaminated Areas
• Hazard Areas
• Casualties

• Nuclear Weapon Effects Phenomenology

• Advanced System Survivability Integrated Simulation Toolkit (ASSIST)
• Multiphase Adaptive Zoning environment (MAZe)
• High Altitude Electromagnetic Pulse (HEMP)
• Source Region Electromagnetic Pulse (SREMP)
• Fast running, engineering level code for predicting nuclear environments (NucFast)
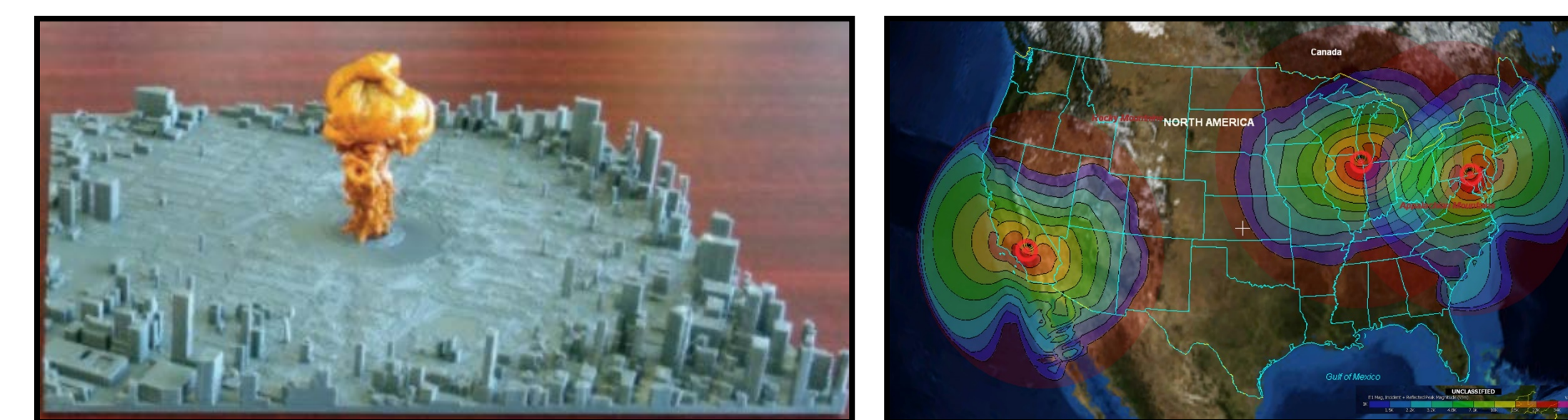

• Indoor Building Modeling

• Chemical or biological agent releases occur inside the building
• Can characterize large buildings in detail - building openings, HVAC and building exhaust system
    • Separate zones for: bathroom exhausts, elevator shaft and stairs, and mechanical rooms
• IBH characterizes indoor releases using CONTAM integrated into HPAC to provide downwind hazards from building releases either burst (instantaneous), sprayer, or agent pool
• Follow-up with HPAC to model atmospheric transport and dispersion due to leaks from the building
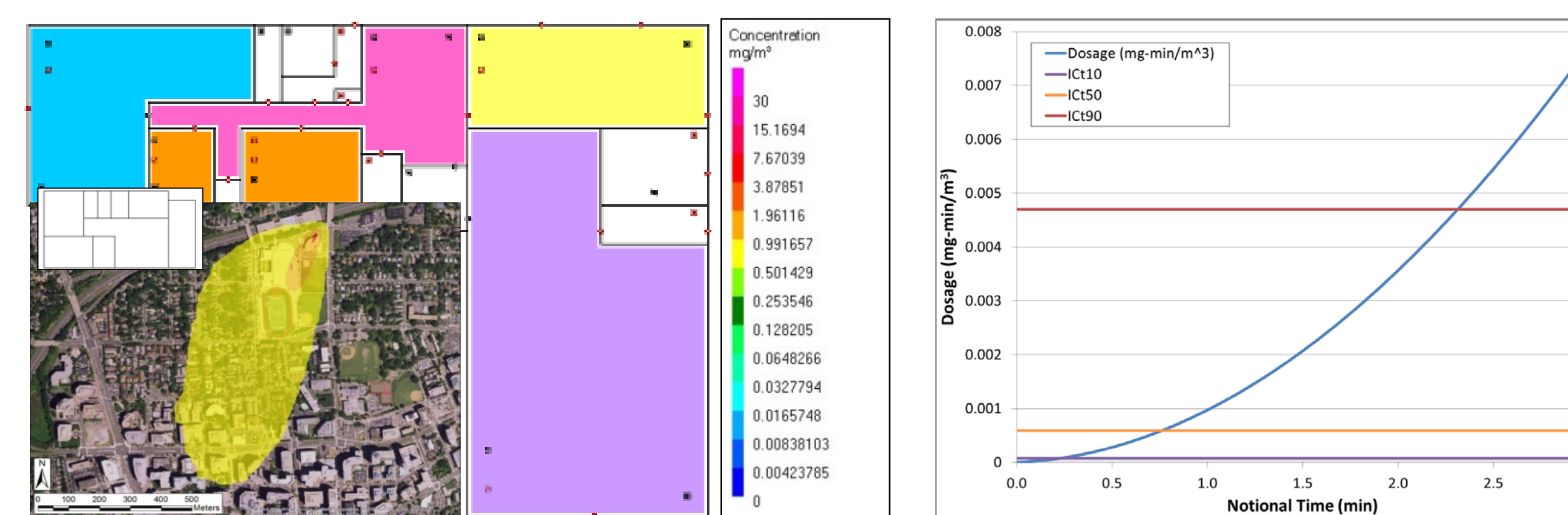
*Analysis shown utilizes immediate uniform mixing throughout the entire room area

• Epidemiological Modeling

• Comprehensive National Incident management System (CNIMS)
• A suite of models that predicts the spread of outbreaks and major hazards by simulating movement, proximity, and interactions between individuals within a geographical region. Supports force protection and response strategies through gap analysis and optimal allocation of resources.
• **Global synthetic population** resource provides demographic and socio-behavioral representation of the world, including detailed demographics, individual network-based movement, and interactions within populations
• Analyzes different courses of action to support decision-making
• User-defined interventions of anticipated quantity and time of implementation
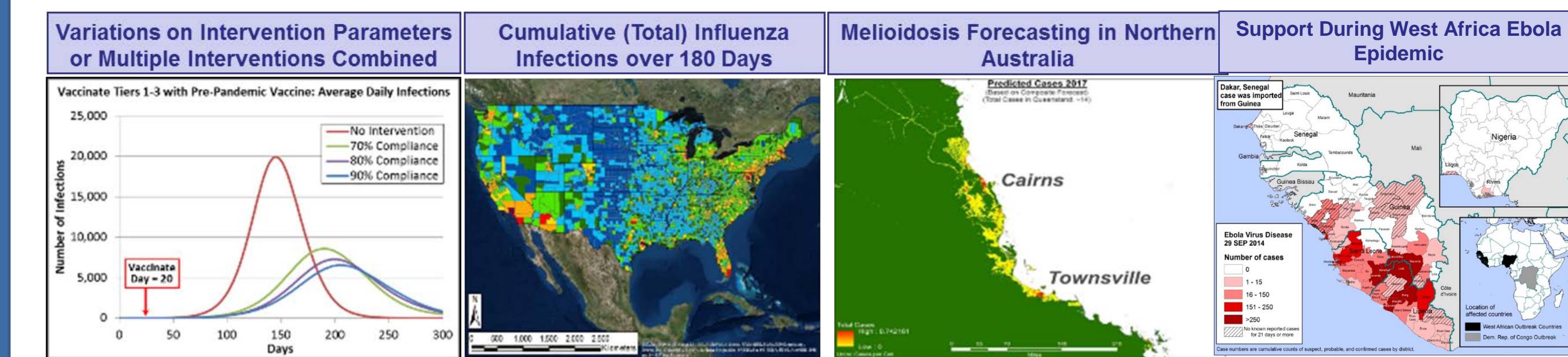
• Waterborne and Natural Hazard Modeling

• **ICWater:** Models downstream dispersal and subsequent hazard
• Stream and river flows used are derived from web accessible real-time gauging stations maintained throughout the USA by USGS
• Time-dependent distribution of contaminant concentrations, simulated by modeled dispersion, dilution, and substance decay
• Reports contaminants arriving at drinking water intakes
• Does not take biological agent growth/replication into consideration
• Does not account for shoreline effects
• Majority of locations are CONUS

• **SHARC:** System for Hazard Assessment of Released Chemicals. Allows dispersion modeling for chemicals in littoral waters
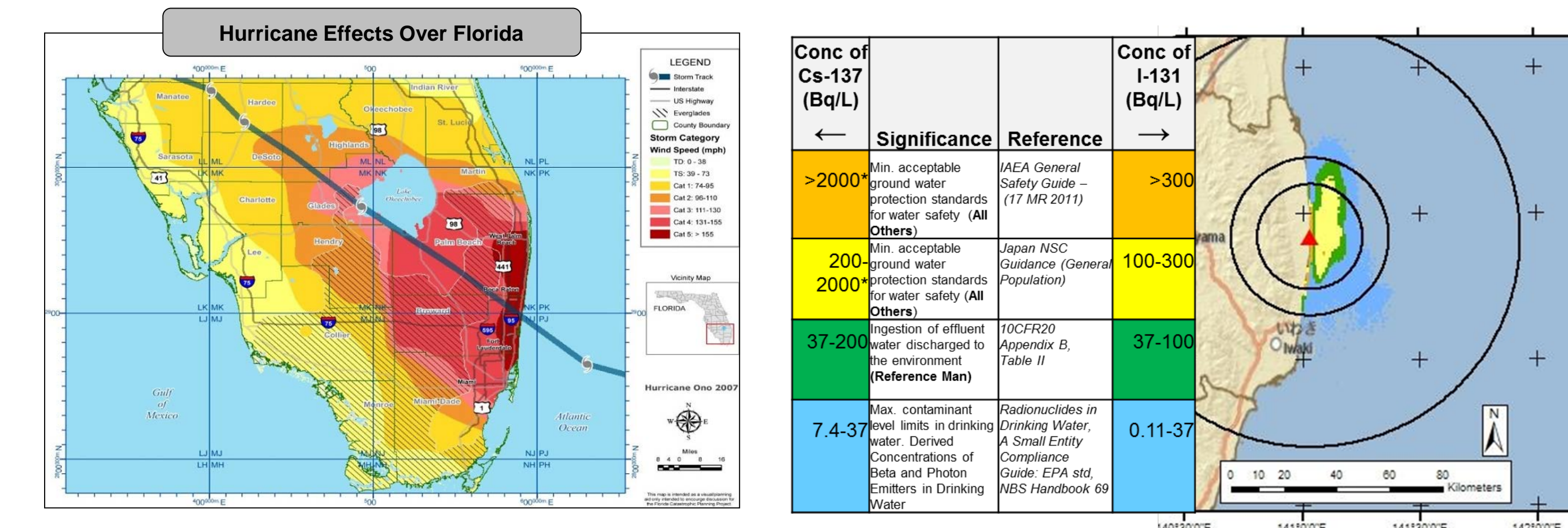
• Research and Development

• Synthetic Opioid Inhalation model capability in HPAC
• Improve incorporation of Radiation Protection Factors into HPAC model
• Improve modeling in urban environments
• Improve water modeling capabilities, including enhanced shoreline fate and transport and capability for biological agents in SHARC dispersion system
• Utilize CNIMS to model power grid failure and its effects