

# SUMMIT Exercise Support for NESC Technology Program Review

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*Sandia National Laboratories*

*SUMMIT Team*

*December 20, 2011*

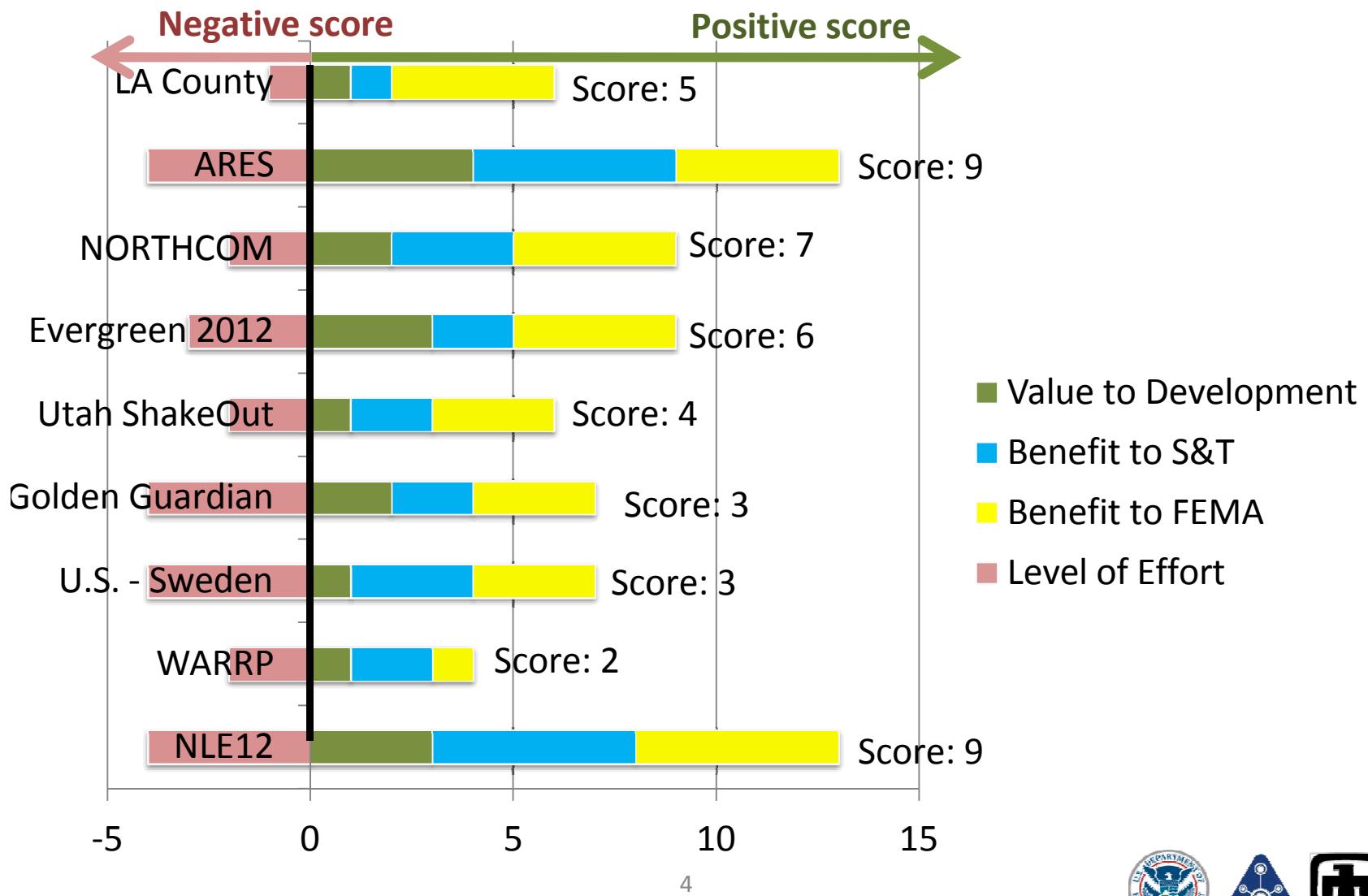


# Topics

- Exercise Support Overview
- Detailed Exercise Status Updates
- Model Acquisition List

	Exercise	Hazard	Status	Exercise Date(s)	What SUMMIT will provide	Benefit to S&T/FEMA
1	Long Beach	RDD	COMPLETED	24-Aug-11	Scenario support via initial interactive modeling. Provide dosage estimates for populations directed to evacuate	Demonstrate re-use of WMD effects template within SUMMIT for a regional exercise.
2	WARRP	Anthrax, Chemical, RDD	COMPLETED	--	Scenario support via medical surge data for chemical, biological, and radiological plumes	Shows SUMMIT support to program planning, not just exercise planning and conduct.
3	LA County Medical Exercise	Earthquake	Ongoing Scoping	8-Dec-11	Scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake.	Demonstrate reapplication of "geo-agile" capabilities developed in SUMMIT for county-level exercise.
4	Evergreen (Seattle)	Earthquake	Ongoing Scoping	Summer 2012	Scenario support via casualty estimates, infrastructure impacted, and medical surge data for earthquake. Advanced viz in field using iPad capability. Provide input for situational awareness in their Regional Incident Management System (RIMS)	Demonstrate reapplication of "geo-agile" capabilities developed in SUMMIT for NLE11 to Region X. Demonstrate SUMMIT linkage to regional operational response tools.
5	NORTHCOM Exercise	Earthquake	Ongoing Scoping	Feb '12	Scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake. Integrate NICHE-PRS	This exercise will demonstrate coordination with DoD. Will serve as a pre-cursor to Golden Guardian.
6	Utah ShakeOut	Earthquake	Ongoing	17-Apr-12	Scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake. Also provide building adjudication tool and utilize Utah building type information.	Demonstrate reapplication of "geo-agile" capabilities developed in SUMMIT for NLE11 to Region VIII.
7	LA Golden Guardian	Earthquake	Ongoing Scoping	Feb 22 (workshop) May 21 (TTX)	Scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake. Potentially also provide building adjudication tool and utilize Utah building type information. Integrate NICHE-PRS and use in exercise	Demonstrate reapplication of "geo-agile" capabilities developed in SUMMIT for NLE11 to Region IX.
8	NLE12	Cyber	Ongoing	Mar – Jun '12	To be determined, Potential downstream consequences and affected infrastructure/services caused by cyber attack and associated outages	Institutionalize SUMMIT's role in M&S support for NLE planning and conduct processes.
9	U.S. - Sweden	Chlorine	Ongoing	23-Jan-12	Scenario support via casualty estimates, infrastructure impacted, and medical surge data for chemical release	Building SUMMIT advocacy understand M&S distribution processes in collaborations with international M&S partners.
10	ARES	Anthrax (CBR?)	Waiting for Guidance	Unknown (series to last 12 months)	To be determine. Potential scenario support via casualty estimates, population movement, medical surge needs, and point of distribution needs for biological release.	Demonstrates "geo-agility" of SUMMIT in a sustained exercise series. Applies an S&T technology in an OHA program. Exercise series provides easy path to transition SUMMIT to NES.
11	Cincinnati	Earthquake	Waiting for Guidance	Mar - Jul	To be scoped	Demonstrate reapplication of "geo-agile" capabilities developed in SUMMIT for regional exercise.

# SUMMIT Mod/Sim Benefit to Exercises



# SUMMIT Supported Exercises

Exercise	Value to Technology Development	Benefits to DHS S&T	Benefits to FEMA NED/NESC	Supplemental Level of Effort/Cost and Relative Risk
Utah ShakeOut (April, 2012)	None	Reusability of the NLE Scenario	NED/NESC would be able to reapply capabilities developed in SUMMIT for NLE11 to Region VIII.	Incorporation of jurisdiction-specific building data and HAZUS files.
WARRP 2011: Scenario	Would inform features needed for planning and analysis.	Shows SUMMIT support to program planning, not just exercise planning and conduct. Applies an S&T technology in another S&T program.	Helps NED/NESC develop its business plan for interagency scenario planning support.	Additional utilities need created to incorporate plume data created by WARRP team outside of SUMMIT.
Evergreen (July, 2012)	Would inform features needed for operational support. Some of these include the integration of SUMMIT outputs with incident management systems.	Reusability of the NLE Scenario	Helps FEMA understand M&S distribution processes in collaborations with international M&S partners	Integration with RIMS in Seattle. Incorporation of jurisdiction-specific building data and HAZUS files.
US-SWE (January, 2012)	Application of “what if” scenarios will demonstrate flexibility and ease of use. Able to receive data from Sweden’s air dispersion modeling service.	Building SUMMIT advocacy with international partners	Helps FEMA understand M&S distribution processes in collaborations with international M&S partners.	Development and inclusion of Sweden air dispersion model and population data is complete. There are still some refinement of modeling outputs that need to occur.

Yellow highlighting: highest value/lowest cost

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<b>National Level Exercise 2012*</b>	Could expand application domains of SUMMIT (e.g., cyber/physical effects models). Could potential support conduct.	SUMMIT would become an institutionalized part of a highly visible sustained exercise series.	Helps NED/NESC demonstrate capabilities to broad community.	Additional models (unidentified) would be needed to provide value. Unknown exercise objectives and modeling needs slow development progress.

\* Not a regional exercise, but has regional implications

Yellow highlighting: highest value/lowest cost

# Exercises Under Consideration

Exercise	Value to Technology Development	Benefits to DHS S&T	Benefits to FEMA NED/NESC	Supplemental Level of Effort/Cost and Relative Risk
NORTHCOM Workshop (February, 2012).	Inclusion of the NICHE-PRS Model.	NORTHCOM is familiar with an proficient in many aspects of SUMMIT. This exercise will demonstrate coordination with DoD.	Will serve as a pre-cursor to Golden Guardian.	NORTHCOM has the SDK and will wrap NICHE-PRS independently. Incorporation of jurisdiction-specific building data and HAZUS files.
Golden Guardian, (May, 2012)	Additional objectives may force additional models (mass care/sheltering, port reconstitution, water conveyance) or added HAZUS outputs	Reusability of the NLE Scenario	NED/NESC would be able to reapply capabilities developed in SUMMIT for NLE11 to Region IX	It is unknown if stakeholders/planners possess models to support objectives. There will be an additional cost to wrap models if needed. Incorporation of jurisdiction-specific building data and HAZUS files.
ARES 2012	Exercise series: geo-agility. Could expand application domains of SUMMIT (e.g., SNS model).	SUMMIT would become an institutionalized part of a sustained exercise series. Applies an S&T technology in an OHA program.	NED's ongoing support to ARES would be augmented by SUMMIT. Exercise series provides easy path to transition SUMMIT to NESC. Cost per exercise will decrease.	Additional models (BERM) would be needed to provide value. CSE has already wrapped BERM. Slow response from OHA has hindered progress.
LA County Medical Health Exercise	Would inform capability needs for medical health exercises	Demonstrate reusability of the NLE 11 scenario	NESC support to county exercise, leading up to Golden Guardian 2012	Earthquake scenario: minimal additional effort.

Yellow highlighting: highest value/lowest cost

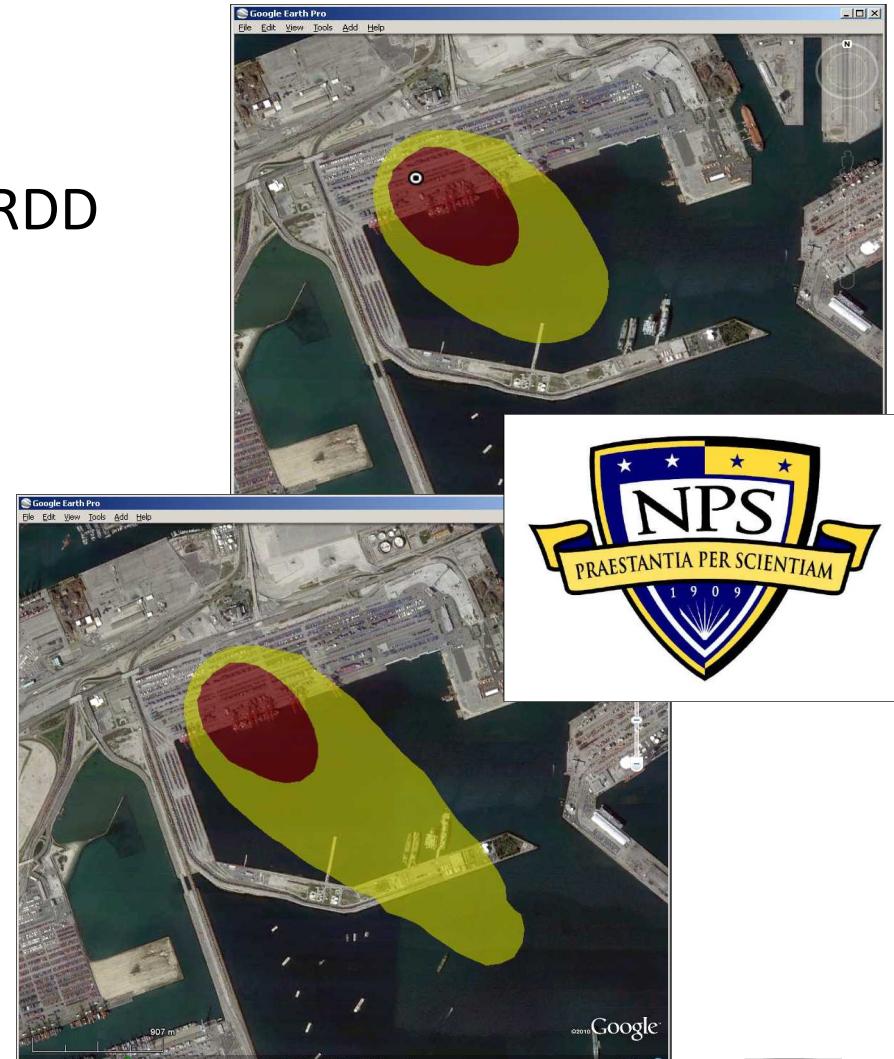
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# Long Beach RDD Exercise (*completed*)

*S&T Funded*

- Overview
  - SUMMIT provided plume and casualty scenario support to RDD release
- Progress
  - Exercise conducted 8/24/11
- Issues
  - None
- Need from S&T/FEMA
  - None

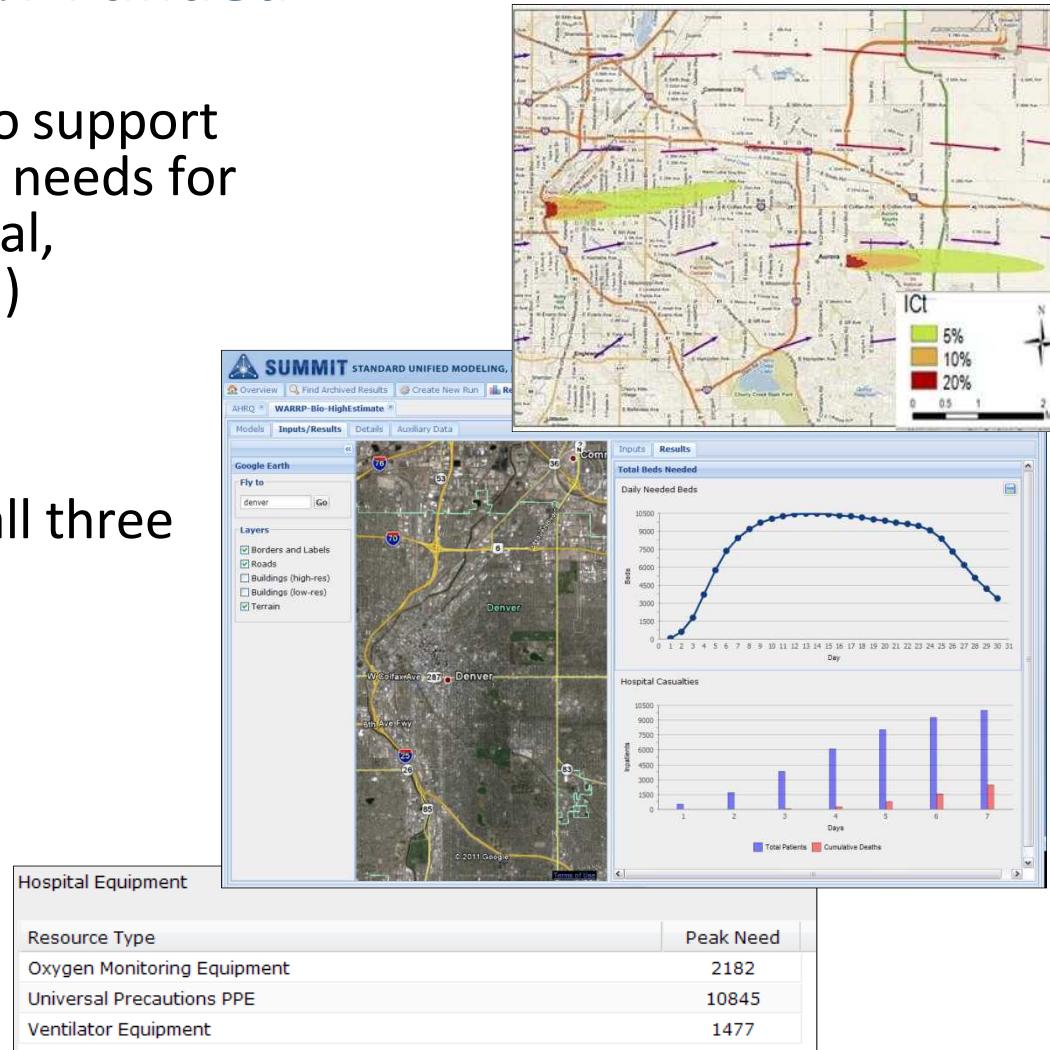




# DHS S&T WARRP (*completed*)

## *S&T Funded*

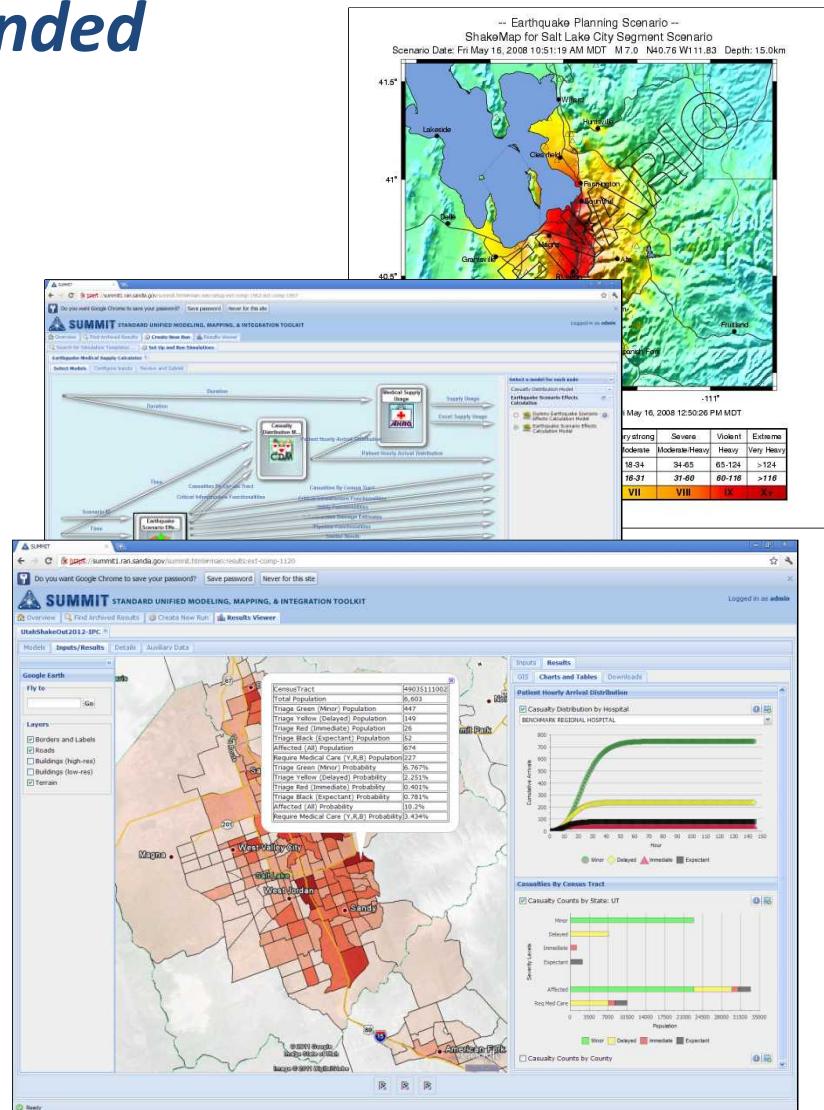
- Overview
  - SUMMIT provided scenario support in terms of medical supply needs for numerous threats (chemical, biological, and radiological)
- Progress
  - Provided deliverables for all three threat scenarios
- Issues
  - None
- Need from S&T/FEMA
  - None



# Utah ShakeOut 2012 Exercise

## *S&T and NESC Funded*

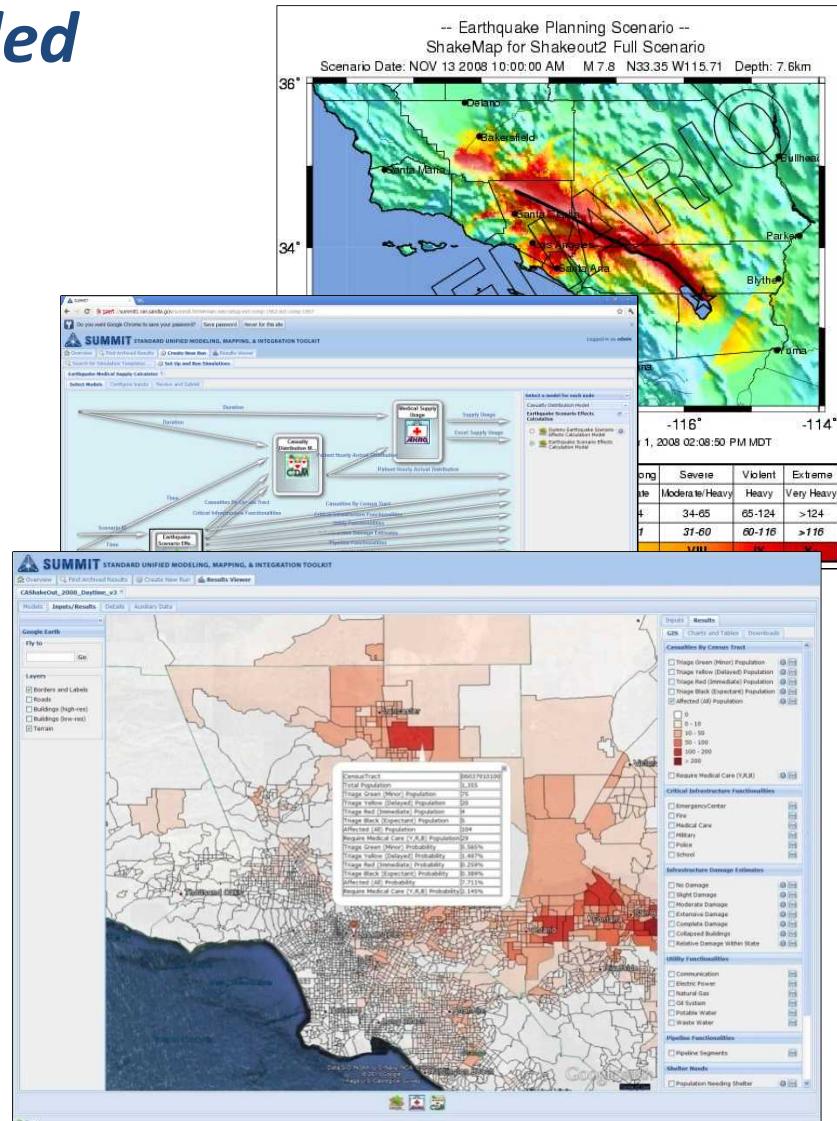
- Regional Partner
  - Jeff Gafkjen, REO FEMA Region VIII
- Overview
  - SUMMIT will provide NLE11 scenario support products to Utah ShakeOut including building adjudication tool.
- Progress
  - Provided SUMMIT accounts to locals
  - Modifying building randomization model to input additional building-type information (critical local request)
  - Waiting on locals to provided updated HAZUS earthquake file, and building inventory information. Should arrive in next few weeks.
- Issues
  - Lack of license-free 3-D building images to perform full iPad capability
- Need from S&T/FEMA
  - None



# LA County Medical Needs Exercise

## *NESC Funded*

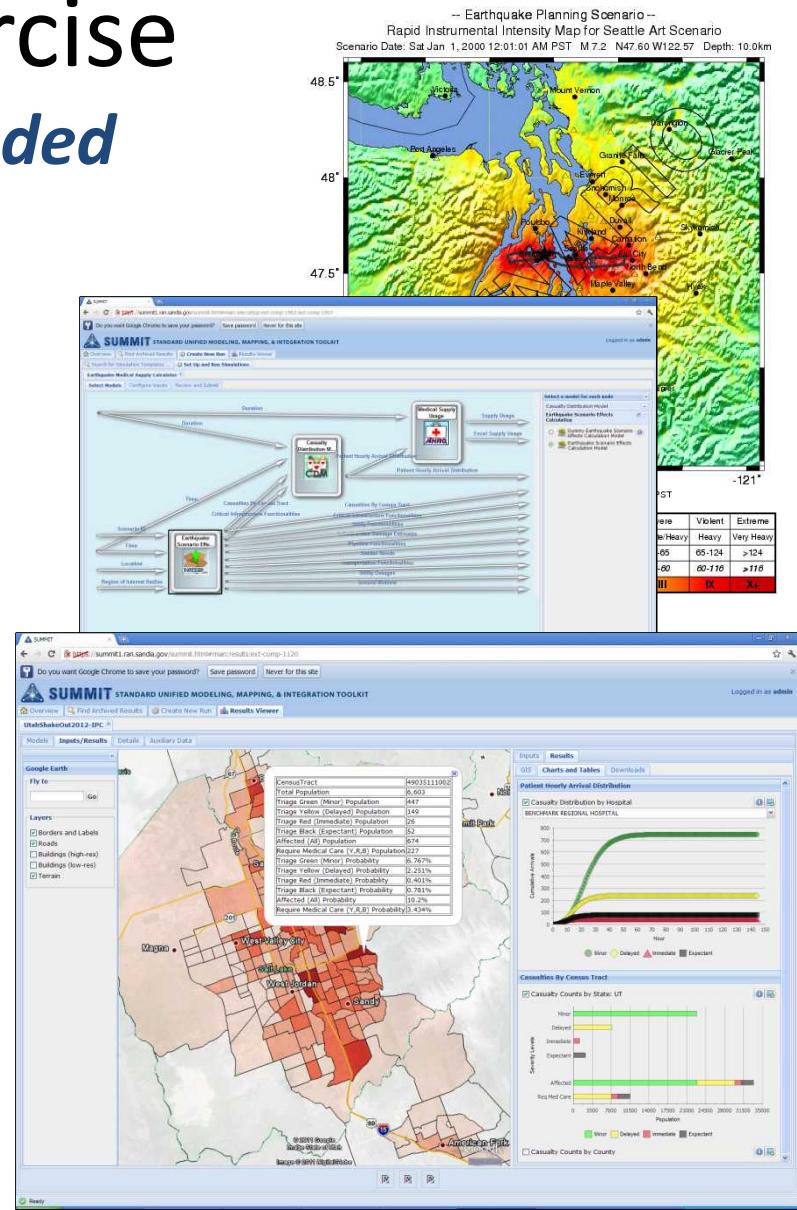
- Overview
  - SUMMIT would provide NLE11 scenario support products to LA County Medical Needs exercise subject to the availability of local data.
- Progress
  - Provided preliminary So. Cal earthquake results using NLE11 template for planning team consideration
  - Attended IPC on 12/8
- Issues
  - Displaying HSIP Gold data to locals is not allowed by license agreement
  - 2008 CA USGS ShakeMap run with standard HAZUS configuration does not produce >500 deaths required by planners
- Need from S&T/FEMA
  - None



# Evergreen Exercise

## *S&T and NESC Funded*

- Overview
  - SUMMIT would provide scenario support via casualty estimates, infrastructure impacted, and medical surge data for earthquake. Advanced viz in field using iPad capability. Provide input for situational awareness in their Regional Incident Management System (RIMS)
- Progress
  - Still scoping involvement with King County, Hillman Mitchell
- Issues
  - None
- Need from S&T/FEMA
  - Need approval to support (Hillman provided request on 10/27)
  - Guidance on scope of support desired by SUMMIT



# Golden Guardian Exercise

## *S&T and NESC Funded*

- Overview

- SUMMIT would provide scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake. Potentially also provide building adjudication tool and utilize Utah building type information. Wrap NICHE-PRS and use in exercise

- Progress

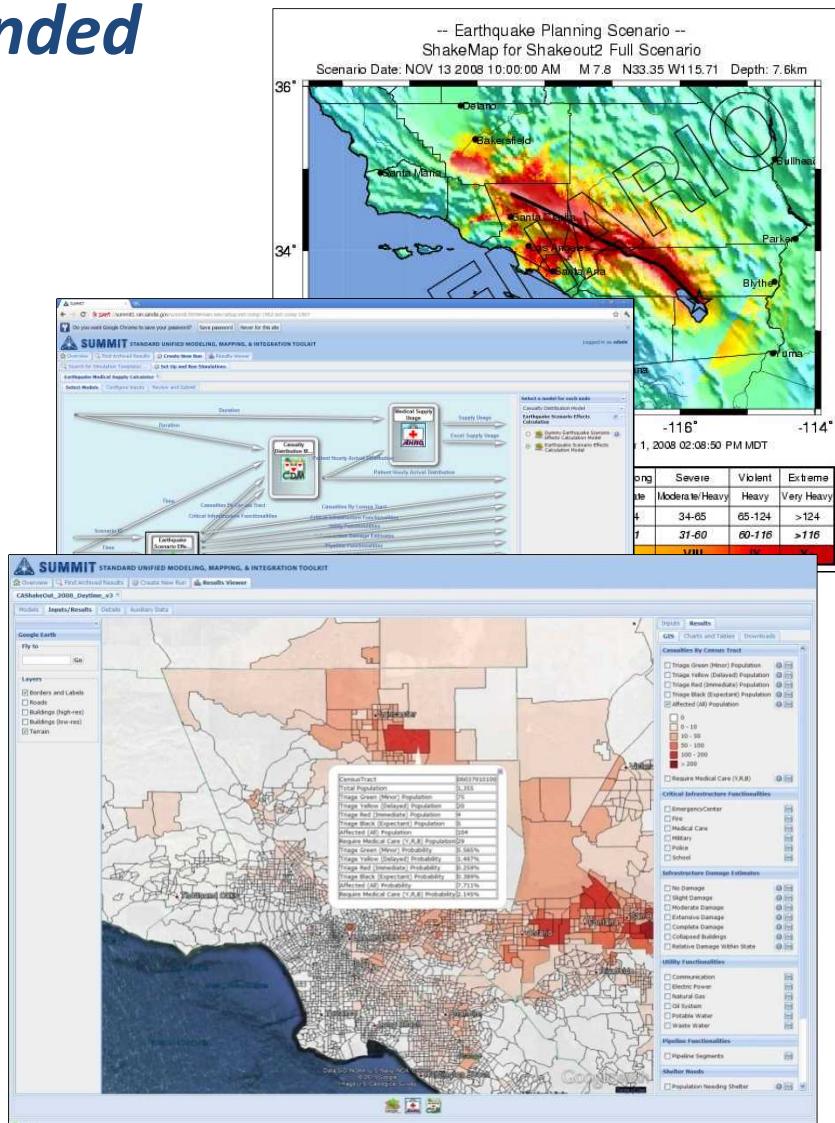
- Participated via WebEx the IPC on 12/13
  - Still scoping potential involvement

- Issues

- Planners desire to use 2008 scenario data, so might need to develop new capabilities to provide value-added support
  - 2008 CA USGS ShakeMap run with standard HAZUS configuration will not produce enough damage or match 2008 report. 2008 planners used modified HAZUS inventory, which SUMMIT team has been unable to obtain

- Need from S&T/FEMA

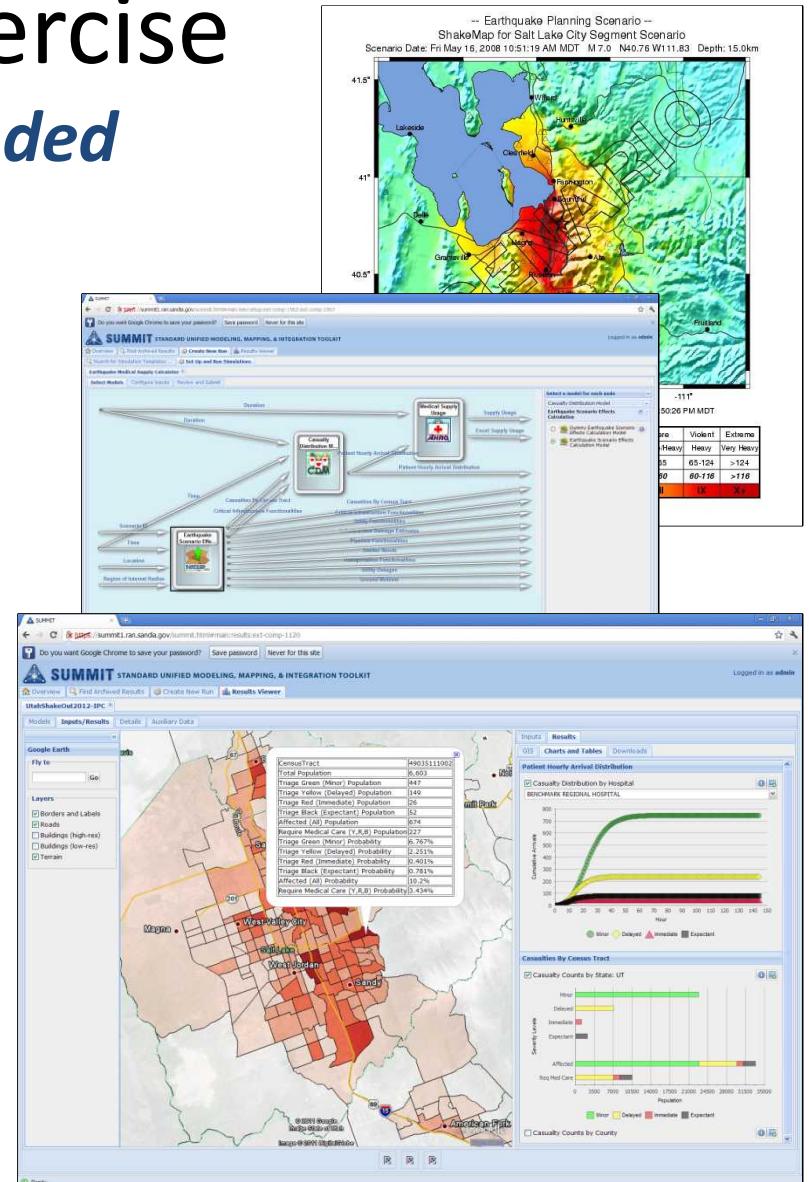
- Guidance on how to proceed with NICHE-PRS
  - Will need approval to support



# NORTHCOM Exercise

## *S&T and NESC Funded*

- Overview
  - SUMMIT would provide scenario support via casualty estimates, infrastructure impacted, casualty arrival rates, and medical surge data for earthquake. Wrap and use NICHE-PRS in exercise
- Progress
  - Have had scoping discussions with Yale New Haven on potential pathways forward with NICHE-PRS/SUMMIT integration.
  - IPC occurred on 12/8
- Issues
  - Competing deliverables for SUMMIT and NICHE-PRS developers
  - Tight development timelines (exercise early Spring 2012)
- Need from S&T/FEMA
  - Guidance on how to proceed with NICHE-PRS



# US-Sweden Exercise

## *S&T Funded*

- Overview
  - SUMMIT will provide scenario support in terms of casualties, affected infrastructure, and medical supply needs for a chlorine release in a Sweden city.
- Progress
  - Have wrapped Swedish air dispersion model and infrastructure data
- Issues
  - Export control challenges with passing data (US -> SWE and SWE -> US)
- Need from S&T/FEMA
  - Guidance on exercise date and coordination to ensure all legal issues resolved.



**CRISMART**  
Crisis Management Research and Training

# NLE12

## *S&T and NESC Funded*

- Overview
  - SUMMIT would provide scenario and conduct support for Exercise #3 (Capstone Cyber with Physical Effects) and potentially Exercise #2 (Cyber effects) and #4 (Continuity)
- Progress
  - Engaged with FEMA NED and NESC on understanding potential areas for SUMMIT engagement
  - Attended IPC and Cyber Awareness Briefings
  - Identified preliminary models to consider
- Issues
  - Very limited applicable models within SUMMIT will require more external engagement and acquisition from additional sources (e.g., NISAC, ANL,..)
  - Uncertain exercise objectives makes correct model acquisition challenging
  - Very tight deliverable timeframe
- Need from S&T/FEMA
  - FEMA to allow SUMMIT team “visibility” to scenario design working group and objectives.
  - Insight into key models or areas of interest (e.g., Rail, Oil, and Finance)
  - FEMA assistance in surveying NLE12 stakeholders for modeling resources and securing assets when appropriate

 **FEMA** National Level Exercise (NLE) 2012 Exercise Coordination Group Meeting August 24, 2011

**Meeting Agenda**

Date:	August 24, 2011
Time:	2:00pm - 3:00pm Eastern Daylight Time (EDT)
Location:	DHS FEMA HQ/NESC, Room 324
Call-in and PIN:	1-800-320-4330 / 361352
Adobe Connect:	<a href="https://fema.connectsolutions.com/nle2012ecg/">https://fema.connectsolutions.com/nle2012ecg/</a>

2:00pm - 2:10pm      Welcome and Introductions  
 2:10 pm - 2:30 pm      NLE 2012 Overarching Objectives Update  
 2:30pm - 2:45pm      NLE 2012 Initial Planning Conference Concept  
 2:45pm - 2:55pm      Cyber Awareness Seminars  
 2:55pm - 3:00pm      Next Steps and Action Items  
 3:00 pm      Adjourn

### NLE12 Timeline

Task	Deliverable Description	Expected Month of Execution
NLE Planning	NLE 2012 Exercise Coordination Group (ECG)	Monthly
NLE Planning	National Initial Planning Conference	Aug-11
NLE Planning	Regional Initial Planning Conferences	Sep-11
NLE Event Conduct	National Seminar	Sep-11
NLE Event Conduct	Regional Seminar	Oct-11
<b>NLE Planning</b>	<b>National Mid-term Planning Conference</b>	<b>Dec-11</b>
NLE Planning	Regional Mid-Planning Conferences	Dec-11
NLE Planning	National MSEL Synchronization Conf#1	Feb-12
NLE Planning	Regional MSEL Synchronization Conf#1	Feb-12
NLE Event Conduct	National Tabletop Exercise	Feb-12
NLE Planning	Regional Tabletop Exercises	Feb-12
NLE Planning	National Final Planning Conference	Mar-12
NLE Planning	Regional Final Planning Conferences	Mar-12
NLE Planning	National MSEL Synchronization Conference #2	Apr-12
NLE Planning	Regional MSEL Synchronization Conferences	Apr-12
<b>NLE Event Conduct</b>	<b>Conduct National Functional Exercises</b>	<b>April-July 2012</b>

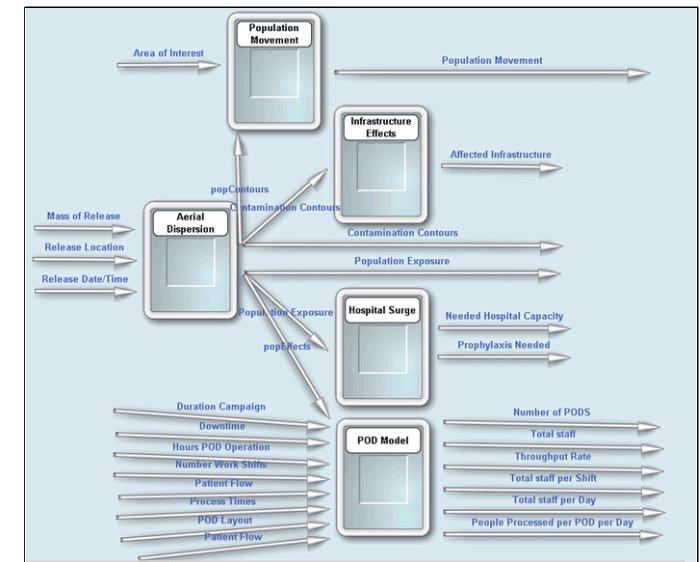
Ideally, SUMMIT Products Delivered

SUMMIT Deployed in MCC

# ARES

## *S&T and NESC Funded*

- Overview
  - SUMMIT could provide scenario support in terms of casualties, affected infrastructure, medical supply needs, and prophylaxis throughput rates for a biological releases in a numerous US cities.
- Progress
  - Wrapped POD, and population movement models that could be used to support exercise
- Issues
  - Lack of clarity on scope and timelines of ARES
- Need from S&T/FEMA
  - Information on state of ARES exercises



Proposed new template

# Topics

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# Model Acquisition List

Model Name	Development Needed	Estimate (Order of Magnitude) Cost* Does not include overhead required to secure access to models	Win
<b>HSIP Database (remainder)</b>	Define database slot in architecture Define data types	\$30k	All scenarios
<b>HAZUS (earthquake, hurricane, flood)</b>	Wrap model modules Model module order of preference: Earthquake Hurricane Flood Define data types	Wrap and automate (with automation tool) \$75k.  Data types \$50k  Note: Given the complexity of HAZUS, it is highly recommended that this work be completed by HAZUS developer. Use of external developer (non-HAZUS) would likely cost 2-3 times more than estimated above.	Increase threat coverage
<b>Transportation model, such as: Cube transportation architecture (COTS) -or- Other transportation model (VISTA, VISSIM)</b>	Scope level of effort Wrap model Define data types For each jurisdiction, link datasets	Wrap model & define data types (if model is ready) \$50k  *need to work out licensing/business model	All threats, most scenarios
<b>Logistics model, such as: LogiSims (NISAC/LANL) or LPAT</b>	Scope Level of Effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$50k  Data collection \$25k	All threats, most scenarios
<b>NG-Fast (natural gas network)</b>	Modify model (ANL) Wrap model Define data types	Model modification \$ UNKNOWN  Wrap model \$30k	Potential NLE 12 support

# Model Acquisition List

Model Name	Development Needed	Estimate (Order of Magnitude) Cost* Does not include overhead required to secure access to models	Win
<b>EP-Fast (electrical grid for Eastern connect)</b>	Modify model (ANL) Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Potential NLE 12 support (less likely than NG-Fast)
<b>Information Management System/Tool, such as: WebEOC, RIMS, MedMap</b>	Scope level of effort Wrap tool	Wrap tool (incl. data type converter) \$60k	Good foray into response Links SUMMIT to operational tools (RIMS) Evergreen support
<b>EPRAM NISAC/LANL (electrical grid restoration)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
<b>Contagious disease model, such as: EpiSims – NISAC/LANL -and- CDC Pan Flu Data</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k  Wrap pan flu data \$10k	Supports pan flu scenarios
<b>HavBed</b>	Scope level of effort Wrap tool	Wrap model & define data types (if model is ready) \$20k	Good foray into response. Supports many scenarios.
<b>Telecommunications model, such as: N-SMART (NISAC/LANL)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
<b>Analytical Response Tool/Model Such as: PATH/AWARE (service dependencies and prioritization of restoration)</b>	(PATH/AWARE) Modify model Wrap model Define data types	Wrap model & define data types \$60k	Good for foray into response, Good for planning. Links SUMMIT to operational tool. (PATH-AWARE) data intensive regionally—opportunity to develop standard for configuring tools that are regionally data intensive.

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<b>RASCAL</b> <b>(radiation plume)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Supports NRC Regional Exercise Program
<b>HPAC</b> <b>(plume)</b>	Re-wrap for all modules (industrial chemical)	Wrap additional modules, define additional data types \$25k	Expands threat space
<b>NOAA MOST</b> <b>(tsunami, flooding)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Expands threat space
<b>N-ABLE</b> <b>NISAC/SNL</b> <b>(supply chain economic impact)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
<b>Regional RealOpt</b> <b>(medical dispensing model)</b>	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios

# Models Current SUMMIT-compliant

Model Name	Capability
HPAC	Chlorine railcar tanker, [get info from Christine]
HAZUS extractor	Extracts data from HAZUS database files (model not wrapped)
GIS utility	Calculates intersecting area of polygons (e.g., calculate exposure population under chemical plume)
Air transportation	Estimates population movement resulting from major air transportation locations
Regional population movement	Estimates day-night population movement on a regional census tract level
AHRQ	Hospital surge model (resources)
BERM	POD model
Building Randomizer	Distributes census tract building damage to individual buildings
Chem/bio dose-response health effects	Calculates the probability of lethality or infection given dose exposure to chem./bio agents
Air Dispersion	Calculates aerial dispersion of various toxic substances
NLE11 Casualty distribution	Distributes casualties to nearest undamaged hospital

# BACK-UP SLIDES



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