

SUMMIT Exercise Support for NESC Technology Program Review

Sandia National Laboratories

SUMMIT Team

December 20, 2011



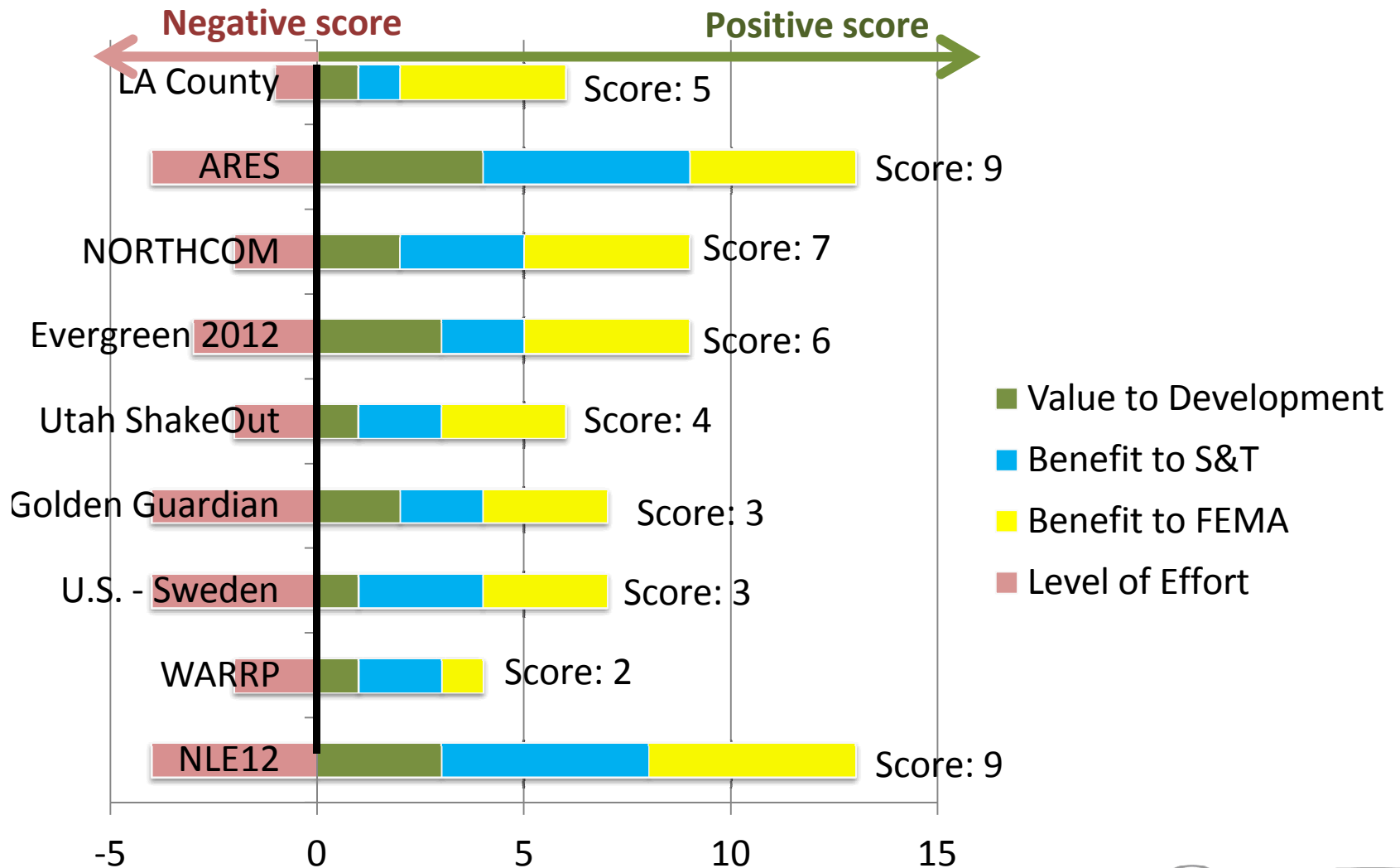
Topics

- 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 NESC.
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



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
National Level Exercise 2012*	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



Topics

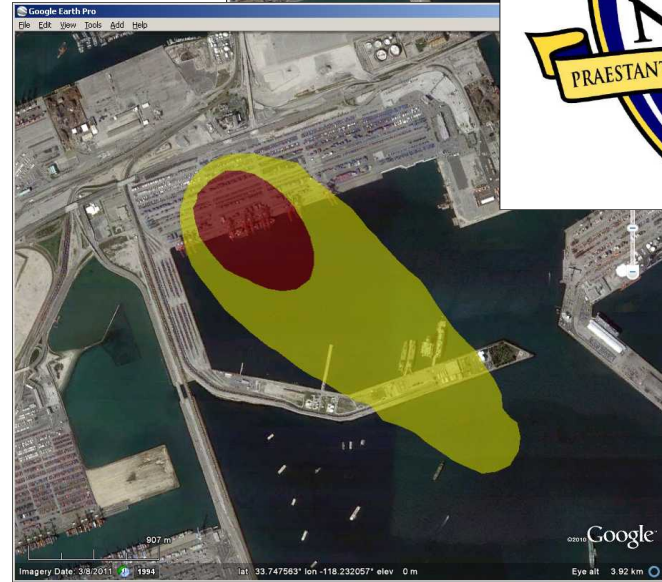
- Exercise Support Overview
- Detailed Exercise Status Updates
- Model Acquisition List



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

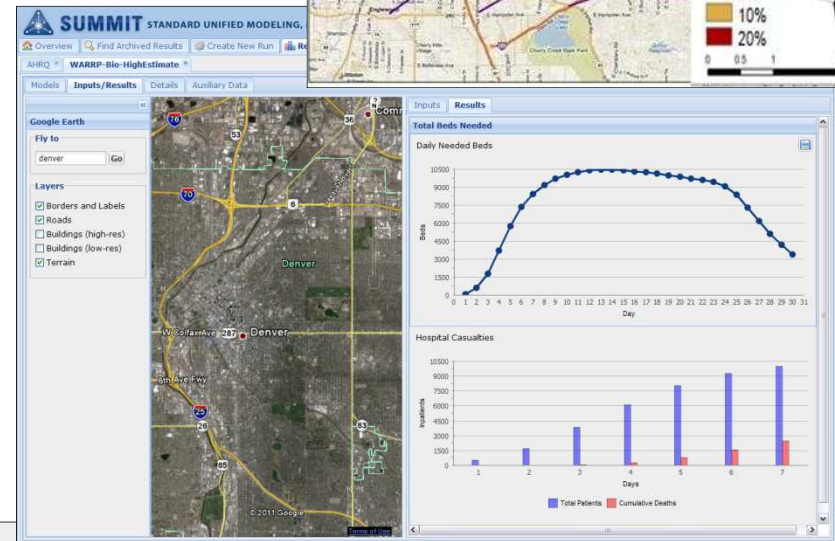
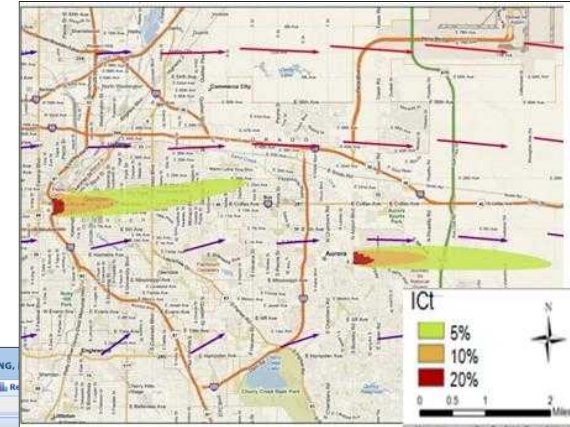




DHS S&T WARRP *(completed)*

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



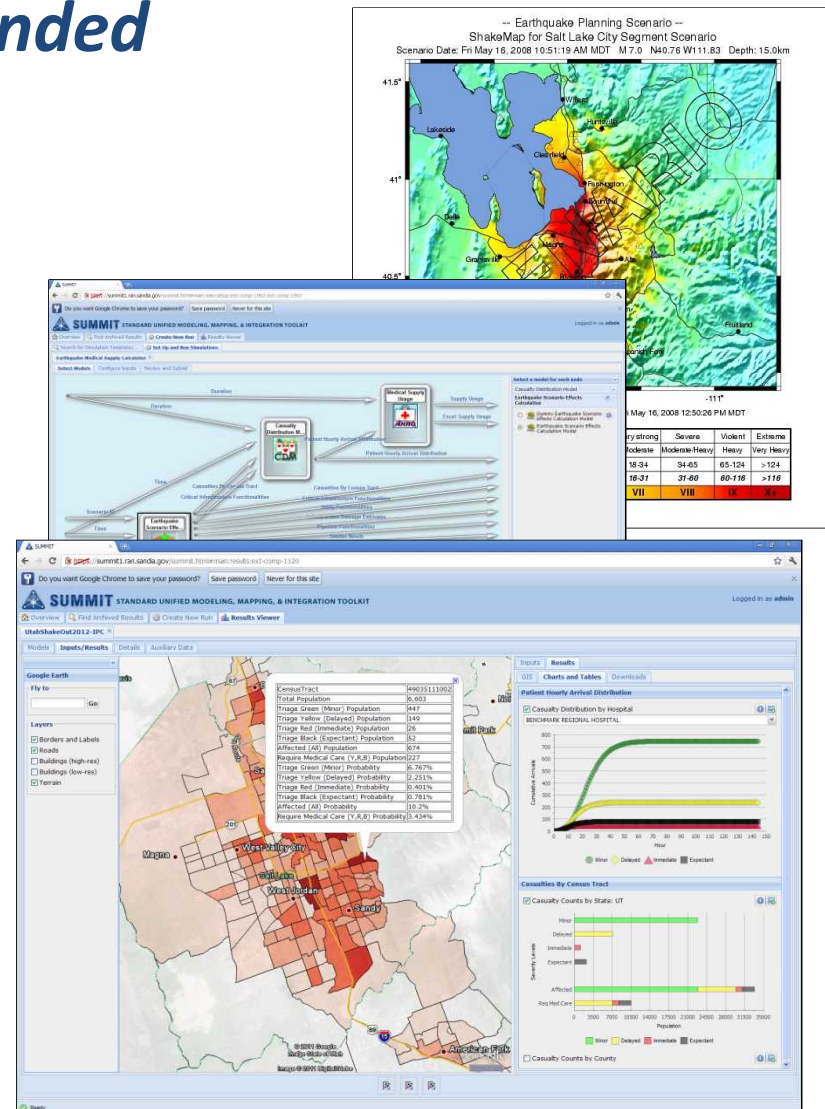
Hospital Equipment

Resource Type	Peak Need
Oxygen Monitoring Equipment	2182
Universal Precautions PPE	10845
Ventilator Equipment	1477

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



NESC Funded

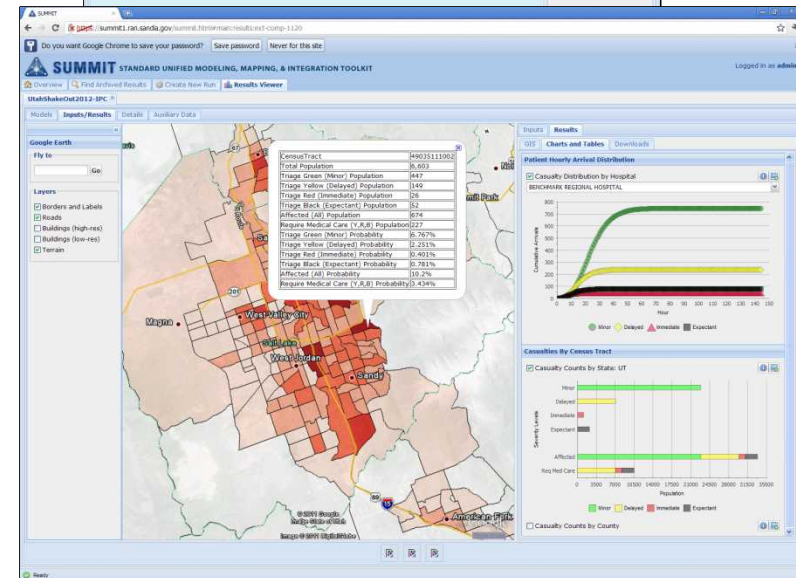
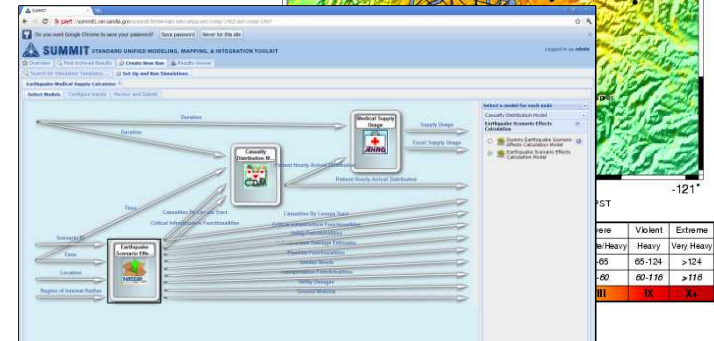
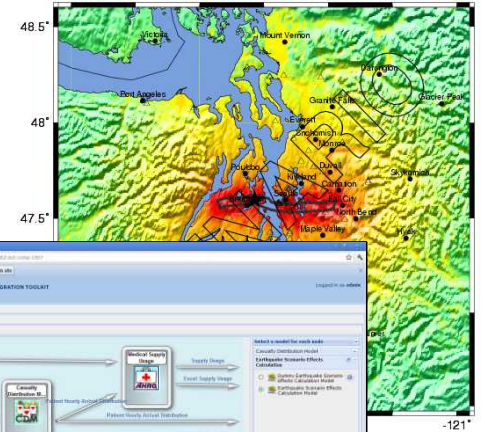
-
- Figure 1 displays the Earthquake Planning Scenario - ShakeMap for Shakeout2 Full Scenario. The top portion shows a map of the San Francisco Bay Area with a color-coded seismic hazard overlay. The bottom portion is a screenshot of the SUMMIT (STANDARD UNIFIED MODELING, MAPPING, & INTEGRATION TOOLKIT) software interface. The interface displays a map of the same area with various overlays, including a legend for 'Seismicity' and 'Seismic Hazard'. A table on the right side of the interface shows the 'Seismic Hazard' data for different locations, with columns for 'Seismicity', 'Seismic Hazard', and 'Seismic Hazard'.

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

– Earthquake Planning Scenario –
 Rapid Instrumental Intensity Map for Seattle Art Scenario
 Scenario Date: Sat Jan 1, 2000 12:01:01 AM PST M 7.2 N47.60 W122.57 Depth: 10.0km



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: <https://fema.connectsolutions.com/nle2012ecg/>

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
NLE Planning	National Mid-term Planning Conference	Dec-11
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
NLE Event Conduct	Conduct National Functional Exercises	April-July 2012

Ideally, SUMMIT Products Delivered

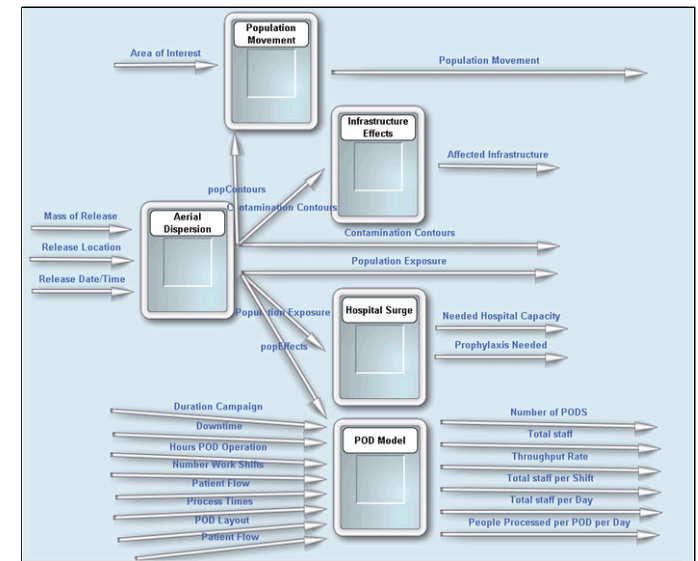
SUMMIT Deployed in MCC



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

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



Model Acquisition List

Model Name	Development Needed	Estimate (Order of Magnitude) Cost* Does not include overhead required to secure access to models	Win
HSIP Database (remainder)	Define database slot in architecture Define data types	\$30k	All scenarios
HAZUS (earthquake, hurricane, flood)	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
Transportation model, such as: Cube transportation architecture (COTS) -or- Other transportation model (VISTA, VISSIM)	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
Logistics model, such as: LogiSims (NISAC/LANL) or LPAT	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
NG-Fast (natural gas network)	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
EP-Fast (electrical grid for Eastern connect)	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)
Information Management System/Tool, such as: WebEOC, RIMS, MedMap	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
EPRAM NISAC/LANL (electrical grid restoration)	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
Contagious disease model, such as: EpiSims – NISAC/LANL -and- CDC Pan Flu Data	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
HavBed	Scope level of effort Wrap tool	Wrap model & define data types (if model is ready) \$20k	Good foray into response. Supports many scenarios.
Telecommunications model, such as: N-SMART (NISAC/LANL)	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
Analytical Response Tool/Model Such as: PATH/AWARE (service dependencies and prioritization of restoration)	(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.

Model Acquisition List

Model Name	Development Needed	Estimate (Order of Magnitude) Cost* Does not include overhead required to secure access to models	Win
RASCAL (radiation plume)	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Supports NRC Regional Exercise Program
HPAC (plume)	Re-wrap for all modules (industrial chemical)	Wrap additional modules, define additional data types \$25k	Expands threat space
NOAA MOST (tsunami, flooding)	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Expands threat space
N-ABLE NISAC/SNL (supply chain economic impact)	Scope level of effort Wrap model Define data types	Wrap model & define data types (if model is ready) \$30k	Many scenarios
Regional RealOpt (medical dispensing model)	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



	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 NESC.
11	Cincinnati	Earthquake	Waiting for Guidance	Mar - Jul	To be scoped	Demonstrate reapplication of “geo-agile” capabilities developed in SUMMIT for regional exercise.