PROGRAM
The Integrated Modeling, Mapping, and Simulation (IMMS) program is designing and prototyping a simulation and collaboration environment for linking together existing and future modeling and simulation tools to enable analysts, emergency planners, and incident managers to more effectively, economically, and rapidly prepare, analyze, train, and respond to real or potential incidents.

OBJECTIVES
When complete, the IMMS program will demonstrate an integrated modeling and simulation capability that supports emergency managers and responders with 1) conducting “what-if” analyses and exercises to address preparedness, analysis, training, operations, and lessons learned, and 2) effectively, economically, and rapidly verifying response tactics, plans and procedures.

OPERATIONAL IMPACT
Federal, state, local, and tribal emergency managers and responders must be able to take effective action during a broad set of natural and man-made catastrophic incidents. To do this, they must be able to assess the impact of these incidents on today’s increasingly complex society and infrastructure, marshal and effectively deploy a broad range of response assets, and do so in a highly diverse, dynamic, and multi-jurisdictional environment. As these events are, fortunately, relatively rare, the incident management community must rely on pre-event planning and exercises to develop knowledge and understanding of appropriate mitigation and response strategies, and on real-time “what if” trade-offs during an event. In addition, they must have ways to develop and maintain skills that are seldom used but vital nonetheless. The effective and integrated use of modeling and simulation tools, and their underlying data, will enable increased realism and fidelity in these planning, training/exercise, and operational activities.

SCIENCE AND TECHNOLOGY CONTRIBUTION/DELIVERABLES
To leverage the nation’s extensive suite of existing datasets, models, and simulation tools as an integrated system, the IMMS program is developing the Standard Unified Modeling and Mapping Integration Toolkit (SUMMIT), a software framework for rapidly linking together these resources, and supporting collaboration across user communities.

SUMMIT will enable:
- Discovery and exploitation of models, simulations, data, and archived analyses that are relevant to a specific scenario or event of interest
- Bringing together users and modeling resources from many locations while ensuring that access to existing data and models is controlled by the resource owners
- “Automatically” linking together disparate modeling tools
- Playing of “what if” scenarios for complex incidents
- Archiving and managing analysis results (including model configuration parameters)
- Use of novel visualization and collaboration environments for enhancing user understanding of simulation results
SCIENCE AND TECHNOLOGY CONTRIBUTION/DELIVERABLES (CONTINUED)

Integrated visualization and collaboration environments

SUMMIT capability demos will demonstrate distributed models/data, distributed clients, multi-domain networking, results archive, virtual world-based collaboration of the SUMMIT system, virtual world-based visualization of field data (limited geography), and planning and exercise CONOPS. Key SUMMIT architecture concepts and use of SUMMIT for incident management are being presented in research papers and conferences, and a series of workshops and beta user deployments are planned for engaging the model developer and end user community in requirements generation and test/evaluation. Other program deliverables include whitepapers concerning study and analysis of SUMMIT deployment configuration, assessment of virtual worlds to support collaborative incident planning activities, exercises, and immersive visualization of simulation data, and transition of the IMMS system to production.

CUSTOMERS, USERS, PARTNERSHIPS AND STAKEHOLDERS
The primary customer for this project is FEMA. While initial versions of this capability will be deployed at FEMA’s National Simulation and Exercise Center (NESC), the system, when delivered, will support a multitude of State/local Emergency Managers and First Responders. In addition, S&T is working to leverage complementary efforts funded or managed by other federal agencies.

PROGRAM MANAGEMENT
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