



Advanced Topics in Hazard Prediction

DRACCM as an Advanced Analytical Framework for CB Casualty Estimation and Resource Planning

Jason Rodriguez, Applied Research Associates, Inc
Steven Antrim, Applied Research Associates, Inc
Christopher Dumond, Applied Research Associates, Inc.
Stephen Moser, Applied Research Associates, Inc
Nick Duncan, Applied Research Associates, Inc
Jim Furlong, Applied Research Associates, Inc

The DoD Resource Augmentation for Civilian Consequence Management (DRACCM) tool estimates casualties and medical resource needs in the event of a CB incident in civilian environments. A recent re-architecting of DRACCM restructured the monolithic desktop code into series of 11 microservices, 8 of which have their own user interfaces (UIs). These microservices were designed to work as a single suite of tools that make up the DRACCM program but also to work alone or with other applications, affording a greater level of flexibility to advanced analysts or application developers. The microservices were developed in Docker, meaning any software written in any language can communicate with the microservices as long as they are also in Docker via a web API. A sampling of these that are part of the DRACCM suite include:

- HPAC API – A fast-running microservices that can query the SCIPUFF adaptive grid for any available data at any available time or location.
- Population API – A microservice that can load a segment of the LandScan population database at different resolutions (day/night, 3-/30-arcsecond).
- Troop Template API – A microservice that allows users to load georeferenced troop templates onto a map in order to estimate casualties and resource needs within military populations.
- Health Effects API – A lightweight version of FXCODA, the health effects module in HPAC.

The DRACCM framework is designed to be modular and expandable in order to include data from different transport & dispersion tools, health effects models, population data sources, and other models and data sources. As a proof of concept, the DRACCM developers developed a methodology to replace DRACCM's own contagious disease model with the contagious disease models in EpiGrid, an application developed by Los Alamos National Lab. Both models use the same input data and return the same outputs and are designed to be swappable within a Docker framework.