

**Environmental Security Technology Certification Program (ESTCP)**

**CLIMATE MODEL COMPARATIVE ASSESSMENT  
FOR DOD INFRASTRUCTURE APPLICATIONS**

**OBJECTIVE**

Demonstration projects are sought to address infrastructure resilience needs for the Department of Defense (DoD). Specifically, proposals are sought for projects that will assess the currently available approaches regarding statistical and dynamical downscaling of climate-related data and that can be applied to the 6<sup>th</sup> Coupled Model Intercomparison Project (CMIP6) climate model data for the purpose of informing DoD infrastructure planning. Projects are needed that compare, contrast, and identify technical readiness and maturity of currently available state-of-the-science and engineering practice approaches that support infrastructure site planning and engineering design needs for DoD installations in the contiguous US (CONUS), Alaska (AK), and Hawaii (HI).

Proposed projects should assess the following:

- Strengths and weaknesses of current state-of-the-science downscaling approaches as related to DoD infrastructure planning and design needs.
- Extent to which various downscaling approaches may or may not be particularly suited for regional application within CONUS, AK, and HI.
- Uncertainty impacts inherent in the use of different gridded historical datasets used for the purpose of providing local reference climate data for the different approaches examined.
- Capability to use the downscaled climate data within the context of plausible scenarios while following robust decision-making principles.

The proposed projects must describe model downscaling approach information sources; assess the cost of use from both the computer computational requirements and fiscal resource perspectives; and characterize, using case studies, the ability of the various model approaches to provide appropriate, authoritative, and practical information to DoD engineers and planners. Preference will be given to projects that combine expert analysis with a decision support aid that clearly and impartially elucidates the various approaches, models, and tools available. Proposals that include a decision support aid also must propose how the decision aid will be demonstrated, identify no less than three and no more than five installations as demonstration sites, and propose the metrics by which success of the decision support aid will be measured. Proposed installations should represent a range of geographic regions, complex terrain, and resource constraints. Preference also will be given to projects that identify and recommend clear metrics or standards for DoD use in evaluating current and future downscaling approaches to meet DoD infrastructure planning and design needs. Metrics of interest to consider may include temporal and spatial resolution for temperature and precipitation (including rain versus snow), other hydroclimatic variables relevant to infrastructure concerns, ability to address the impacts of terrain and altitude on downscaling, and capability to capture impacts of regional to local hydroclimatic phenomena not resolved in the global models. Finally, preference will be given to proposals that describe a robust pathway for

the transition and future sustainment of the proposed decision support tool beyond the duration of the project.

## **BACKGROUND**

The ESTCP Resource Conservation and Resiliency Program Area supports the DoD mission by demonstrating and validating innovative and cost-effective technologies that enhance DoD capabilities that rely on training lands, cantonment areas, test stands, and many other types of facilities and built infrastructure. DoD faces a long-term threat from a changing climate to its infrastructure. The Strategic Environmental Research and Development Program (SERDP) previously published a report<sup>1</sup> on the use of climate information in decision-making. Proposers should familiarize themselves with this report and other published efforts that compare and characterize downscaling methods.

DoD installations currently use the DCAT (Defense Climate Action Tool) for the integration of projected climate conditions into planning. The tool relies on the Localized Constructed Analogs (LOCA) statistical downscaling technique with a daily temporal and 6 km spatial resolution; the technique currently relies on the prior generation CMIP5 global climate models. Using this information, installation personnel may decide to assess local, specific vulnerabilities. The end state for projects resourced through this effort is to provide the DoD a comparative assessment of the next generation of climate information from CMIP6, insight into new developments of statistical and dynamical techniques to downscale the coarse global model output for improved accounting of local conditions, and a consistent framework to evaluate and assess future approaches relevant to DoD infrastructure as they mature.

## **POINT OF CONTACT**

Kurt Preston, Ph.D.

Program Manager, Resource Conservation and Resiliency  
Environmental Security Technology Certification Program (ESTCP)  
4800 Mark Center Drive, Suite 16F16  
Alexandria, VA 22350-3605  
Phone: 502-528-0796  
E-mail: [kurt.t.preston@usace.army.mil](mailto:kurt.t.preston@usace.army.mil)

For pre-proposal submission due dates, instructions, and additional solicitation information, visit the [ESTCP website](#).

---

<sup>1</sup> Kotamarthi, R., L. Mearns, K. Hayhoe, C.L. Castro, and D. Wuebble. 2016. Use of Climate Information for Decision-Making and Impacts Research: State of Our Understanding. Prepared for the Department of Defense, Strategic Environmental Research and Development Program. 55pp.