Kenneth J. Craig

Group Manager, Atmospheric and Emissions Modeling
Principal Scientist

Mr. Craig joined STI in 2005 and manages STI's Atmospheric and Emissions Modeling Group. His work focuses on applying numerical models to assess air quality impacts from emissions sources and to understand the complex meteorological and chemical processes that influence air quality from local to hemispheric scales. He also develops prediction systems and decision support tools to support forecasting and air quality management needs. Mr. Craig has a keen interest in quantifying air quality impacts from biomass burning and develops scientific modules for the USDA Forest Service (USFS) BlueSky Framework. In addition, Mr. Craig is actively involved with project-level particulate matter (PM) hot-spot assessments to support federal transportation conformity regulations. He has developed analysis guidance and best practices documents for the California Department of Transportation (Caltrans) on conducting and streamlining PM hot-spot assessments, and he delivers training to Caltrans District staff on using AERMOD to perform PM hot-spot assessments.

Recently, Mr. Craig conducted high-resolution air quality model simulations to better understand winter ozone formation in oil and gas development regions in the Intermountain West. For example, Mr. Craig provided modeling support for the Utah Bureau of Land Management's Air Resource Management Strategy (ARMS) Project, which aims to provide a reusable modeling platform suitable for air quality management decisions affecting the Uinta Basin. Mr. Craig also conducted air quality model simulations in a partnership with Syracuse University and the Harvard School of Public Health to quantify the human and environmental health co-benefits of carbon standards for existing power plants. Mr. Craig uses air quality models to estimate single-source impacts, and he recently applied source apportionment to estimate emission source contributions to downwind ozone non-attainment.

Education

- MS, Meteorology, San José State University
- BS, Meteorology, San José State University

Memberships

American Meteorological Society

For a list of publications, see sonomatech.com/ResPub/KJCpub.pdf.

Mr. Craig implemented the STI/USFS BlueSky Gateway Modeling System, which combines existing air quality models with custom fire location software and the BlueSky Framework to produce real-time forecasts of smoke impacts on a national scale. He has used BlueSky Gateway to analyze residential wood burning curtailment strategies in Sacramento, California, and to assess air quality impacts from prescribed burns in the Kansas Flint Hills to support exceptional event demonstrations. Mr. Craig also helped develop a smoke prediction system for western Canada, and developed tools to support prescribed burn decisions in the Kansas Flint Hills region. Mr. Craig is working with the USFS to develop a real-time system that evaluates fire weather prediction accuracy and links fuel moisture maps with weather data to estimate dry lightning fire ignition potential.

Mr. Craig also develops and analyzes large geophysical data sets. He developed algorithms to process meteorological observations and reanalysis data, which the U.S. Environmental Protection Agency uses in their "MetDat" Omnibus Meteorological Database. Mr. Craig also implemented algorithms to calculate high-resolution satellite-based wildfire smoke aerosol optical depth to improve pollution exposure assessments during wildfire events in California. Currently, Mr. Craig is developing algorithms to determine mixing heights from ceilometer data, and he recently implemented ensemble dispersion modeling functionality in the BlueSky Framework to estimate probabilistic smoke impacts from future very large wildfire (megafire) scenarios based on 30 years of climatological reanalysis data.

Before joining STI, Mr. Craig was a research assistant at San José State University and Pennsylvania State University, where he used meteorological models to study interactions between urban heat islands and convection, and airborne LIDAR to study boundary layer responses to land surface variability.

1450 N. McDowell Blvd., Suite 200
Petaluma, CA 94954 • 707-665-9900