

## Frank R. Freedman, PhD, CCM

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### Education

PhD (2003): Stanford University, Civil & Environmental Engineering (Dissertation: Atmospheric Turbulence Modeling)  
MS (1996): San Jose State University, Meteorology  
BS (1992): San Jose State University, Meteorology

### Professional Experience

Sept 2016 – Present      Team Member, Health and Air Quality Applied Science Team (HAQAST), NASA  
Sept 2015 – Present      Research Scientist, Center for Applied Atmospheric Research and Education, SJSU  
Sept. 2004 – Present      Senior Associate, EnviroComp Consulting Inc., Fremont, CA  
Aug. 2004 – Present      Lecturer, San Jose State University (SJSU), San Jose, CA (Adjunct Faculty since 2013)  
July 2006 – Present      Environmental Consultant, Independent  
April 2003 – Mar 2004    Postdoctoral Researcher, National Center for Environmental Prediction, Camp Springs, MD

### Consulting Projects (Selected)

**EnviroComp** (further description at <http://envirocomp.com/>)  
Reconciliation of HARP2 Air Toxics Modeled Concentrations with Monitoring Data (SCAQMD)  
Assessment of Hexavalent Chromium Exposure at Water Treatment Plant at Qarmat Ali (Southern Iraq)  
Evaluation of Agricultural Damage from Herbicide Drift (various projects, mostly in California Central Valley)  
Air Quality Issues in the Beverly Hills High School Area, Beverly Hills, CA  
Odor Assessment from a Proposed Composting Facility in Sunol, CA  
Air Quality Impacts downwind of the Arts St. Fire of 2004 in New Orleans, LA  
Possible Airborne Contamination of Legionella Bacteria in the Lens Region of France  
Evaluation of long-term exposure to DDT particulate from a Superfund site in McIntosh, AL  
The Development of AERMOD-Ready Meteorological Data for the SCAQMD  
Traffic Collision and Visibility Issues from Almond Harvesting, Fresno County, CA

### Independent

Analysis of Air Quality Modeling for Permitting of Lehigh Cement facility in Cupertino, CA (2014-15, for quarryno.org)  
Local Air Quality Impacts from San Jose Airport (2010, for Bay Area Air Quality Management District)  
Modeling of Hydrogen Sulfide from Refineries in Port Arthur (2007 – 08, Thomas Pearson, Esq.)

### Journal Publications and Reports

Freedman, F. R., K. L. Pitts, and A.F.C. Bridger, 2014: Evaluation of CMIP climate model hydrological output for the Mississippi River Basin using GRACE satellite observations. *J. Hydrol.*, **519**, 3566-3577.  
Freedman, F. R., R. D. Bornstein, P. Martien and D. Fairley: "Local Air Quality Impacts from San Jose Airport", Final Report for Mineta San Jose International Airport, December 2010.  
Freedman, F. R. and A. Venkatram: "Development of AERMOD-Ready Meteorological Data for the South Coast Air Basin and Coachella Valley", Final Report for the South Coast Air Quality Management District, February 2009.  
Freedman, F. R., and M. Z. Jacobson, 2003: "Modification of the standard  $\epsilon$ -equation for the stable ABL through enforced consistency with Monin-Obukhov similarity theory", *Bound.-Layer Meteor.*, **106**, 322-341.  
Freedman, F. R., and M. Z. Jacobson, 2002: "Transport-dissipation analytical solutions to the E- $\epsilon$  turbulence model and their role in predictions of the neutral ABL", *Bound.-Layer Meteor.*, **102**, 117-138.  
Zannetti, P., A. D. Daly, and F.R. Freedman, 2015: Dispersion modeling of particulate matter containing hexavalent chromium during high winds in southern Iraq, *J. Air Waste Manage.Assoc.*, **65**, 171-187.  
Svensson G. and co-authors, 2011: "Evaluation of the diurnal cycle in the atmospheric boundary layer over land as represented by a variety of single column models – the second GABLS experiment", *Bound.-Layer Meteorol.*, **140**, 177 – 206.

- Cuxart and coauthors, 2005: "Single-column model intercomparison for a stably-stratified atmospheric boundary layer", *Bound.-Layer Meteorol.*, **118**, 273-303.
- Gopalakrishnan, S. G., F. R. Freedman, M. Sharan and T.V.B.P.S. Rama Krishna, 2005: "A Model Study of the Strong and Weak Wind, Stably Stratified Nocturnal Boundary Layer: Influence of Gentle Slopes", *Pure and Applied Geophys.*, **162**, 1795-1809.
- Sistla, G., N. Zhou, W. Hao, J. Y. Ku, S. T. Rao, R. Bornstein, F. Freedman, and P. Thunis, 1996: "Effects of uncertainties in meteorological inputs on Urban Airshed Model predictions and ozone control strategies", *Atmos. Environ.*, **30**, 2011-2025.

## Conference Presentations

- "Atmospheric Residual Layers: WRF/HYSPLIT Modeling for Better Understanding in Complex Terrain", *AGU Fall Meeting*, San Francisco, CA, 19 December 2014 (poster A51D-3066), co-author Sen Chiao.
- "Assessment of Water Storage Trends and Distributions in the Mississippi River Basin as Simulated by IPCC Models and Compared to GRACE Satellite Data", 2013 Workshop on the use of GRACE Data for Water Cycle Analysis and Climate Modeling, NASA Jet Propulsion Laboratory / California Institute of Technology, July 15 – 17, 2013, Pasadena, CA.
- "Development of AERMOD-ready Meteorological Input Files for the South Coast Air Quality Management District", *2009 Annual Conference and Exhibit*, Air & Waste Management Association, Detroit (MI), 2009
- "Surface cooling predictions of the coupled NMM/WRF PBL and Noah land surface schemes", *16<sup>th</sup> Symposium on Boundary Layers and Turbulence*, American Meteorological Society, San Diego (CA), 2006
- "Testing NCEP Operational Surface Layer Parameterizations for Stable Conditions Using CASES-99 Data", *15<sup>th</sup> Symposium on Boundary Layers and Turbulence*, American Meteorological Society, Portland (Maine), 2004
- "Analysis and pollution implications of the E-ε turbulence model predictions of the neutral ABL", *Millennium (24<sup>th</sup>) NATO/CCMS International Meeting on Air Pollution Modelling and its Applications*, Boulder, 2000.

## Teaching/Lectures/Short Courses

**Lecturer**, San Jose State University. Numerical Modeling (METR240); Mesoscale Modeling (METR245); Air Pollution Engineering and Control (CME177), Boundary Layer Meteorology (METR130); Air Pollution Meteorology (METR/CME131), Atmospheric Dynamics (METR121), Atmospheric Pollution (METR113), Global Climate Change (METR112), Meteorology II (METR 61), Global Climate Change (METR12)

**Instructional Team Member**, "Partnership for Student Success in Science Summer Institute – Air & Weather", June 2006, Synopsis Inc.; Training workshop for California first grade teachers.

**Invited Lecturer**, "Spring Colloquium on Regional Weather Predictability and Modeling, Part I: Workshop on Design and Use of Regional Weather Prediction Models", *The Abdus Salam International Centre for Theoretical Physics*, April 11-19, 2005, Trieste, Italy.

**Tutor**, Chemistry (High school level, South SF Bay area, private); Physics (Port Townsend High School, Port Townsend, WA, September 2012 – April 2013).

## Thesis Committees

Areana Flores (M.S., San Jose State University Dept. of Meteorology and Climate Sciences, 2016): *Exposure Assessment of Asthma and Modeling of PM<sub>2.5</sub> for the October 2007 Wildfire Outbreak in Southern California*

Katie Pitts (M.S., San Jose State University Dept. of Meteorology and Climate Science, 2012): *Assessment of Water Storage Trends and Distributions in the Mississippi River Basin as Simulated by IPCC Models and Compared to GRACE Satellite Data.*

Scott Strenfel (M.S., San Jose State University Dept. of Meteorology and Climate Science, 2010): *Field Measurements and Modeling of PM<sub>2.5</sub> and Carbon Emissions from Prescribed Fires.*

## Awards/Certifications

Team Member, Health and Air Quality Applied Science Team (HAQAST), NASA, 2016

Certified Consulting Meteorologist, American Meteorology Society, 2010

National Research Council Postdoctoral Fellow, NCEP, April 2003 – March 2004.