

## RESUME

**NAME:** Yuan Gao August 2007

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**EDUCATION:** Ph.D. Oceanography, University of Rhode Island, 1994.  
M.S. Oceanography, University of Rhode Island, 1990.  
B.S. Analytical Chemistry, Nan Kai University, China, 1981.

### BRIEF EMPLOYMENT HISTORY:

07/07 - Associate Professor, Department of Earth and Environmental Sciences,  
Rutgers University, Newark, NJ

07/05-06/07 Assistant Professor, Department of Earth and Environmental Sciences,  
Rutgers University, Newark, NJ

09/03-06/05 Associate Professor, Department of Earth and Environmental Studies,  
Montclair State University, Montclair, NJ

2001-2003 Associate Research Professor, Institute of Marine and Coastal Sciences,  
Rutgers University, NJ

2000-2003 Research Scientist, Program in Atmospheric and Oceanic Sciences,  
Princeton University, NJ

2003 - Visiting Associate Professor, Institute of Marine and Coastal Sciences,  
Rutgers University, NJ

1997-2001 Assistant Research Professor, Institute of Marine and Coastal Sciences,  
Rutgers University, NJ

1994-1996 Postdoctoral Research Associate, Institute of Marine and Coastal Sciences,  
Rutgers University, NJ

1988-1994 Graduate Research Assistant (MS/PhD), Graduate School of Oceanography,  
University of Rhode Island (URI), RI

1984-1985 Selected Visiting Scholar, Graduate School of Oceanography, URI, sponsored by  
the US NOAA-China International Exchange Scholar Program, RI

1981-1987 Analytical Chemist, Institute of Marine Environmental Protection, State Oceanic  
Administration, China

**CAREER GOAL:** To serve as a scholar with a combined role of a teacher and researcher working toward the achievement of excellence on both aspects by:

- Contributing to the understanding of the global climate change and biogeochemical cycles through integrated multidisciplinary research.
- Contributing to the creation of the first-class scientists of the coming generation capable of dealing with the land-atmosphere-ocean interactions.

**RESEARCH INTERESTS:**

- Dust chem/phys properties at present and through geological time
- Aeolian iron and global ocean biogeochemistry
- Air-coastal sea chemical exchange: atmospheric nitrogen deposition
- Urban air pollution characterization

**TEACHING INTERESTS:**

- Graduate-level courses in Environmental Geochemistry, Air pollution, Atmospheric Measurements, Chemistry of the Marine Atmosphere.
- Undergraduate-level courses in Meteorology, Oceanography, Weather and Climate, and Earth Sciences.

**RECENT AWARDS AND HONORS:**

1. Faculty Academic Service Merit, Rutgers University, 2006
2. Guest scientist, Third Institute of Oceanography, State Oceanic Administration, China, since 2005.
3. Faculty Academic Service Merit, Rutgers University, 2002.
4. Faculty Academic Service Merit, Rutgers University, 2001.
5. Visiting Scholarship, Department of Education, China, 2001.
6. Faculty Academic Service Merit, Rutgers University, 2000.
7. Faculty Academic Service Merit, Rutgers University, 1999.
8. Faculty Academic Service Merit, Rutgers University, 1998.
9. Oversea Chinese Research Scholarship, Chinese National Natural Science Foundation, 1998.
10. Faculty Academic Service Merit, Rutgers University, 1997.
11. AGU International Travel Award, 1997.
12. Best Paper Award, Marine Environmental Quality Session, North Pacific Science Organization Fifth Annual Meeting (Warren Wooster, Chair), Nanaimo, BC, Canada, October 11-20, 1996.
13. First Winner of the Poster Session of the International Geosphere-Biosphere Program (IGBP) Scientific Symposium: Natural and Anthropogenic Changes-Impacts on Global Biogeochemical Cycles (James Galloway and Jerry Melillo, Co-Chairs), Beijing, China, October 23-25, 1995.
14. Selected Participant, Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS II), Harvard University, Cambridge, MA, and Gordon Research Conference in Atmospheric Chemistry, Newport, RI, 1993.

## **EXTERNALLY FUNDED RESEARCH GRANTS:**

### **CURRENT:**

- PI: \$48,711, “Quantifying the relationships between dust source variability and dust emissions and air-to-sea deposition” sponsored by NSF Atmospheric Chemistry Program, 2007-2009.
- PI: \$946,500, “Natural iron fertilization in the ocean and its impacts on ocean nitrogen fixation and carbon cycles” sponsored by NASA EOS Interdisciplinary Science Program (with Paul Falkowski of Rutgers, Yoram Kaufman of NASA, Daniel Sigman of Princeton, and Michael Follows of MIT), 2004-2008.
- PI: \$81,000, “Characterization of atmospheric nitrogen over the Meadowlands” sponsored by Meadowlands Environmental Research Institute, 2006 – 2008.
- Co-PI: \$376,000, (64% for Rutgers Newark), “Monitoring of air toxic particulate pollutants from heavily trafficked New Jersey Turnpike: An Urban Community-Wide Project” sponsored by US EPA (with Francisco Artigas and Jin Young Shin of Meadowlands Environmental Research Institute), 2006-2008.

\* *Note:* A research workshop entitled “Quantifying Atmospheric Soluble Iron Input to the Ocean” is likely be held within the next 18 months sponsored by NASA, with YG as the lead PI.

### **COMPLETED:**

- PI: \$39,000, “Characterization of Asian aerosol particles during the Asia-Pacific Aerosol Characterization Experiment-ACE-Asia” sponsored by NSF Atmospheric Chemistry Program, 2001-2006.
- Co-I: \$299,500, (20%), “An integrated forward and inverse modeling approach to the prediction of phytoplankton biomass” sponsored by NASA Biological Oceanography Program (with Jorge Sarmiento and Andy Jacobson of Princeton University), 2002-2005.
- PI: \$7,000 (undergraduate research fellowships), “Spectroscopic Characterization of Atmospheric Iron and Its Implication for Phytoplankton Uptake” sponsored by Center for Environmental BioInorganic Chemistry (CEBIC) of Princeton University, 2003-2005.
- PI: \$284,000, “Atmospheric iron fluxes to the ocean: Seasonal patterns and linkage to phytoplankton biomass” sponsored by NASA EOS Interdisciplinary Sci. Program (with Paul Falkowski of Rutgers and Yoram Kaufman of NASA), 2000-2004.
- PI: \$148,000, “Atmospheric deposition of trace metals and nitrogen to the NY-NJ Harbor Estuary” jointly sponsored by NOAA NJ Sea Grant and NJ State Department of Environmental Protection, 1997-2001.
- PI: \$104,000, “Atmospheric nitrogen deposition to Barnegat Bay” jointly sponsored by NOAA NJ Sea Grant and NJ State Department of Environmental Protection, 1998-2001.
- Co-PI: \$255,000, (40%), “Atmospheric deposition of PCBs, PAHs, trace metals and nitrogen to the Hudson River estuary” sponsored by Hudson River Foundation (with Steve Eisenreich of Rutgers), 1997-2000.

### **RECENT PUBLICATIONS (selected):**

- Gao, Y.**, J.R. Anderson, and X. Hua, Dust characteristics over the North Pacific observed through shipboard measurements during the ACE-Asia Experiment, *Atmospheric Environment*, doi:10.1016/j.atmosenv.2007.06.060, 2007.
- Gao, Y.**, M. Kennish, and A.M. Flynn, Atmospheric deposition of nitrogen to New Jersey coastal waters and its implications for nutrient enrichment and biotic impacts, *Journal of the Ecological Society of America*, S31-S41, 2007.
- Ayars, J., and **Y. Gao**, Atmospheric nitrogen deposition to the Mullica River-Great Bay Ecosystem, *Marine Environmental Research*, DOI: 10.1016/j.marenvres.2007.06.004, 2007.
- Yang, H., and **Y. Gao**, Air-to-sea flux of soluble iron: Is it driven more by HNO<sub>3</sub> or SO<sub>2</sub>? - An examination in the light of dust aging, *Atmospheric Chemistry and Physics Discussions*, 7, 10043-10063, 2007.
- Berman-Frank, I, Y.-B. Chen, **Y. Gao**, K. Fennel, M. Follows, A. Milligan and P. Falkowski, Feedbacks between the nitrogen, carbon, and oxygen cycles. *In Nitrogen in the Marine Environment*, D.G. Capone, D.A. Bronk, M.R. Mulholland and E.J. Carpenter (eds), Elsevier, Inc., in press, 2007.
- Xu, N, and **Y. Gao**, Characterization of hematite dissolution affected by oxalate coating, kinetics and pH, *Applied Geochemistry*, in revision, 2007.
- Zhao, Y, and **Y. Gao**, Mass size distributions of water soluble aerosol species over metropolitan Newark in the US East Coast, *Atmospheric Environment*, in revision, 2007.
- Yang, H., **Y. Gao**, and L. Horowitz, The size distribution of entrained dust and the impact on dust load and deposition to the ocean, *Journal of Geophysical Research-Atmospheres*, in revision, 2007.
- Gao, Y.**, S-M Fan, and J. L. Sarmiento, Aeolian iron input to the ocean through precipitation scavenging: A modeling perspective and its implication for natural iron fertilization in the ocean, *Journal of Geophysical Research*, 108, D7, 4221, doi:10.1029/2002JD002420, 2003.
- Gao, Y.**, Atmospheric nitrogen deposition to Barnegat Bay, *Atmospheric Environment*, 36 (38), 5783-5794, 2002.
- Gao, Y.**, E. Nelson, M.P. Field, Q. Ding et al., Characterization of atmospheric trace elements in PM<sub>2.5</sub> particulate matter over the New York-New Jersey harbor estuary, *Atmospheric Environment*, 36 (6), 1077-1086, 2002.
- Gao, Y.**, Y. J. Kaufman, D. Tanre, D. Kolber, and P. G. Falkowski, Seasonal distributions of aeolian iron fluxes to the global ocean, *Geophysical Research Letters*, 28 (1), 29-32, 2001.
- Gao, Y.**, and J. Anderson, Characteristics of Chinese aerosols determined by individual-particle analyses, *Journal of Geophysical Research*, 106, 18,037-18045, 2001.

**PROFESSIONAL CONTRIBUTIONS TO THE FIELDS:**

## **1. Speaker or Convener at National and International Meetings (selected):**

- Gao, Y. (convener), Z. An, H. Hong, and M. Uematsu, Special Session entitled “Asian Dust and its Impacts on Climate and Biogeochemical Cycles,” Western Pacific Geophysical Meeting, Beijing, China, July 22-27, 2006.
- Arimoto, R., M. Uematsu, Y. Gao (convener), Special Session entitled “SEAREX to SOLAS: Thirty Years of Air/Sea Exchange Research,” American Geophysical Meeting, 1 San Francisco, December 11-15, 2006.
- Gao, Y., (invited) Characterization of mineral dust and its implication for global biogeochemical cycles, *2<sup>nd</sup> International Workshop on Mineral Dust*, Paris, France, September 10-12, 2003.
- Gao, Y., (Invited) Aeolian Iron Deposition and Its Potential Linkage to Phytoplankton Biomass: A Case Study in the North Pacific, *AGU Fall Meeting*, San Francisco, December 6-10, 2002.
- Gao, Y., (Invited) Atmospheric deposition of trace elements to NJ coastal waters, *Workshop of Atmospheric Deposition of Pollutants to New Jersey Coastal Waters and its Watershed*, Monmouth University, NJ, April, 2000.
- Gao, Y., (Invited) Chemical characteristics of Asian dust: aerosols and sediment records, *1<sup>st</sup> International Workshop on Mineral Dust*, Boulder, June 9-11, 1999.
- Gao, Y., (Invited) Atmospheric nitrogen deposition to Barnegat Bay, the *15th International Estuarine Research Federation Conference*, New Orleans, September 25-30, 1999.
- Gao, Y., (Invited) Atmospheric deposition of trace metals and nitrogen to New Jersey coastal waters, *AGU Spring Meeting*, May 26-29, 1998.
- Gao, Y., (Invited) Atmospheric chemistry and transport of Asian dust, *The Yellow Sea Guest Seminar Series*, Korea Ocean Research and Development Institute, Seoul, Korea, Oct. 12-18, 1997.
- Gao, Y., (Invited) Mineral dust over East Asia, *American Association for Aerosol Research Annual Meeting*, Orlando, October 14-18, 1996.
- Gao, Y., (Invited) Cycling of contaminants through the atmosphere: Long-range transport vs. regional deposition, *North Pacific Marine Science Organization Fifth Annual Meeting*, Nanaimo, BC, Canada, October 11-20, 1996.

## **2. Invitee at the Research Planning, Panel, Program Meetings (selected):**

- (1) NASA Ocean Color Team meeting, Seattle, WA, April 10-13, 2007.
- (2) NASA Interdisciplinary Science Panel, Washington DC, July 17-19, 2006.
- (3) NASA Ocean Color Team meeting, Newport, RI, April 11-13, 2006.
- (4) NASA New Investigator Program Panel, Washington DC, March 7-9, 2004.
- (5) NASA Ocean Color Panel, Washington DC, August 4-6, 2003.
- (6) Workshop on Validation Data Sets for Modeling Mineral Aerosol in Global Climate Change, Jene, Germany, May 2-4, 2002
- (7) 1<sup>st</sup> US Surface Ocean Lower Atmosphere Study (US SOLAS) planning meeting, Potomac, MD, May 16 - 18, 2001.

- (8) 1<sup>st</sup> International SOLAS planning meeting, Kiel, Germany, Feb. 20-24, 2000.
- (9) 3<sup>rd</sup> International Aerosol Characterization Experiment – Asia Pacific Region (ACE-Asia) planning meeting, Kunming, China, Nov. 10-14, 1999.
- (10) 2<sup>nd</sup> International ACE-Asia planning meeting, Cheju Island, S. Korea, Oct. 10-14, 1998.
- (11) 1<sup>st</sup> International ACE-Asia planning meeting, Nagoya, Japan, Nov. 11-13, 1997.

### **3. External Reviewer for Federal Programs and Journals (selected):**

#### **Federal Programs:**

- (1) NSF Atmospheric Chemistry Program
- (2) NSF Chemical Oceanography Program
- (3) NSF Physical Meteorology Program
- (4) NSF Ocean Technology and Interdisciplinary Coordination Program
- (5) NSF CAREER Program
- (6) NASA Sensor Intercomparison and Merger for Biological and Interdisciplinary Oceanic Studies Program
- (7) NASA Earth System Science Fellowship Program
- (8) NASA Carbon Cycle Science Program
- (9) NASA Earth Science New Investigator Program
- (10) NASA Modeling Analysis and Prediction Program

#### **Professional Journals:**

- (1) Science
- (2) Journal of Geophysical Research-Atmospheres
- (3) Global Biogeochemical Cycles
- (4) Atmospheric Environment
- (5) Environmental Science & Technology
- (6) Geology
- (7) Annals of Glaciology
- (8) Water, Air, & Soil Pollution
- (9) Terrestrial, Atmospheric and Oceanic Sciences
- (10) Molecules (an online journal in Synthetic Chemistry and Natural Product Chemistry)
- (11) Chemosphere

### **4. Academic Seminars (most recent):**

Gao, Y., Interactions of the atmosphere and biosphere (aquatic or human? Or both?): our ongoing research and new research initiatives at Rutgers Newark, Biology Colloquium, Department of Biological Sciences, Rutgers Newark, October 10, 2006.

Gao, Y., Land-Atmosphere-Ocean Interactions: Nutrients Biogeochemical Cycles, presented at The Third Institute of Oceanography, State Oceanic Administration, Xiamen, China, March 8, 2006.

Gao, Y., Dust Characterization: A Shipboard Approach, presented at Institute of Earth Environmental, Chinese Academy of Sciences, Xi'an, China, March 5, 2006.

Gao, Y., Dust and Ocean-Biosphere Interactions, presented at College of Environmental Sciences, Peking University, Beijing, China, February 28, 2006.

Gao, Y., Particulate Air Pollution: How Airborne Particles Affect our Life and Beyond? presented at Environmental Engineering and Applications Workshop for High School Teachers, New Jersey Institute of Technology, Newark, NJ, November 2, 2005.

Gao, Y., Mineral Dust and Its Impacts on Global Biogeochemical Cycles, presented at Geology Colloquium, Department of Geological Sciences, Rutgers University, New Brunswick, NJ, September 7, 2005.

### **TEACHING ACTIVITIES (selected):**

#### Courses taught at Rutgers Newark (2006-2007 academic year):

- (1) Air Pollution Measurements (3 credits, graduate level),
- (2) Environmental Geology (3 credits, undergraduate level),
- (3) Global Climate Change: Science, Myth, and Policy (team-taught freshmen seminar),
- (4) \*Planet Earth Lab (undergraduate level).  
\* managed 14 lab sessions (~300 undergraduate students) and 6 graduate TAs, no lecture.

#### Courses taught at Rutgers Newark (2005-2006 academic year):

- (1) Air Pollution Measurements (3 credits, graduate level),
- (2) Weather and Climate (3 credits, undergraduate level).

#### Courses taught at Montclair State University, 6 courses per academic year (2003-2005):

- (1) Air Resource Management (3credits, graduate level),
- (2) Environmental Geosciences (3 credits, graduate level),
- (3) Environmental Geochemistry (3 credits, graduate/upper undergraduate level),
- (4) Understanding Weather and Climate (4 credits, undergraduate level),
- (5) The Earth and Environment (3 credits, undergraduate level).