

## Curriculum Vitae

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### Education:

BS Biology, State University of New York, College at Oneonta,	1978
MS Medicine: Critical Care, Emory University, Atlanta, Georgia,	1980
MSPH Env. Health, UAB School of Public Health, Birmingham, Alabama,	1984

### Professional Background:

Scientific Advisor: Bureau of Environmental Health November 2017 to present  
Bureau of Environmental Health, Florida Department of Health

- Provide technical support for topics including:
  - Health impacts from aquatic toxins including cyanobacteria and other harmful algal blooms (HABs)
  - Contamination of Fish by PCBs, mercury, and other compounds
  - Risk Assessments related to human exposures to environmental contaminants
  - Facilitate workgroups addressing workforce development and retention; fish advisories for Florida fresh water bodies
  - Evaluations of proposed new pesticide registration in Florida

Administrator: Public Health Toxicology Section Dec. 2015 to Nov. 2017  
Bureau of Environmental Health, Florida Department of Health

- Supervisor of Section programs including:
  - Toxicology Assessments
  - Radon and Indoor Air
  - Hazardous Waste Site Assessments, and
  - Environmental Health Preparedness

Chief (Interim): Bureau of Environmental Health August 2014 – Dec. 2015  
Division of Disease Control and Health Protection, Florida Department of Health

- Supervisor of diverse programs of over 80 staff including:
  - Public Health Toxicology: Radon, Hazardous Waste Site Assessments
  - Environmental Health Preparedness
  - Monitoring and testing of Beach Water Quality
  - Public Drinking Water Systems and Private Wells
  - Permitting of Biomedical Waste Treatment and Transport
  - Food Services Inspections
  - Onsite Sewage Systems
  - Mobile Home Parks, Group Care Facilities, Tanning and Tattoo Establishments;

- Swimming Pools
- Environmental Health Database including permitting and online billing

Coordinator, Water Toxins Program January 2014 - August 2014

Public Health Toxicology Section, Florida Department of Health

- Supervision of Aquatic Toxins Staff and implementation of Private Well Initiative;
- Assessment of microbiological and chemical contaminants found in private and small drinking water sources;
- Identify and validate suspected public health issues related to the use of private and small drinking water wells and systems; drinking water wells and systems;
- Implement comprehensive public health messaging and education to encourage private well water testing and evaluate proposed mitigation strategies. "Is Your Well Water, Well?"

Coordinator, Aquatic Toxins Program 2004 - 2014

Public Health Toxicology Section, Bureau of Epidemiology; Florida Department of Health

Responsible statewide oversight for technical, investigative, and programmatic duties:

- Programmatic oversight, policy development, guidance setting;
- Supervision including hiring, firing, performance appraisals, professional development;
- Facilitate collaboration and coordination for technical and programmatic assistance to FDOH county health departments, federal, state, and local governments, and public for consensus building, public health response, and outreach to impacted communities;
- Promote interaction between public health scientists, health care professionals, laboratories, and non-public health professionals for event response and resolution;
- Development and submission of federal and state grant submissions, renewals and annual reports including activities and budget narratives;
- Selection and grant oversight of projects funded through FDOH as part of CDC grant to state agencies, universities, non-profit organizations and citizen advisory groups;
- Identification of illness utilizing Florida-based and national surveillance systems to evaluate disease prevalence and incidence, disease distribution, and emerging illnesses;
- Case investigations including review of medical records, laboratory analyses, interviewing cases and health care providers;
- Case reviewer for FDOH reportable disease database, Merlin;
- Development and implementation of human health studies on environmental exposures to assess impacts related to respiratory illness (including sensitive populations), dermal effects, and systemic impacts;
- Evaluate toxicology for exposure potential and associated human health risks.

Environmental Manager, Drinking Water Toxics Program 1990 - 2004

Division of Environmental Health; Florida Department of Health

Coordinate state-wide ground water sampling programs related to chemical contamination of private drinking water supply; responsibilities:

- Development, design and analysis of the statewide program to assess public health impact of human exposures from toxic compounds;

- Programmatic oversight, policy development, guidance setting;
- Supervision including hiring, firing, performance appraisals, professional development;
- Development of health advisories for select chemicals and contaminants;
- Represent FDOH in public meetings, interagency working groups, and federal state water quality workshops;
- Presentations to various technical, university, and citizen based meetings and seminars.

Biological Administrator, Bureau of Toxicology and Hazard Assessment 1988 - 1990

Division of Environmental Health; Florida Department of Health

Direct and supervise the Hazard Assessment Unit:

- Development, design and analysis of the statewide program to assess public health impact of hazardous waste sites;
- Program planning, monitoring and evaluation;
- Development and submission of federal and state grant submissions, renewals and annual reports including activities and budget narratives.

Environmental Specialist, Environmental Hazards Epidemiology 1984 - 1988

Florida Department of Health and Rehabilitative Services

Technical consultation to county health departments concerning environmental contamination:

- Potential routes of human exposure;
- Adverse health impacts; Remedial activities.

Respiratory Therapist, Strong Memorial Hospital 1981 - 1982

University of Rochester, Rochester, New York

General and advanced respiratory and intensive care medicine

- National Board of Respiratory Care: Registered Respiratory Therapist #12859
- Clinical care to neonates, children, and adults including in critical care units;
- Airway management, ventilatory support and therapy;
- Blood gas sampling and analysis;
- Response to emergency department events and in-hospital CPR needs;
- Interpretation and clinical applications of laboratory analyses;
- In-service education;
- Researcher in clinical projects including *in-vivo* assessments.

Intensive Care Respiratory Therapist 1978 - 1981

Grady Memorial Hospital, Atlanta Georgia

Advanced respiratory and intensive care medicine

- Advanced biomedical electronic monitoring
- “Cutting edge” clinical care to neonates, children, and adults in critical care units;
- Airway management, ventilatory support and therapy;
- Response to emergency department events and in-hospital CPR needs
- Blood gas sampling and analysis;
- Interpretation and clinical applications of laboratory analyses;
- Team member on neonatal regional ambulance to transfer critically ill patients to “Level 3” facility

Internship: Intensive Care Medicine 1980  
 Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, New York  
 Intensive care medicine with focus on advanced biomedical electronic monitoring.

Internship: Intensive Care Medicine 1980  
 Mount Sinai Medical Center, Bronx, New York  
 Intensive care medicine with focus on advanced respiratory care.

### **Leadership:**

- Gold Medal in the Promotional Campaigns category for in-house production of “Is Your Well Water, Well?” by National Public Health Information Coalition. 2015.
- Ebola Incident Command Team: Lead for Environmental Branch (2014)
- Chair - Gulf of Mexico HAB Integrated Ocean Observing System (IOOS) Public Health Group (2007-2014)
- Co-Chair – Centers for Disease Control and Prevention, Environmental Health Tracking Content Working Group on Harmful Algal Blooms (2011 – 2016)
- Representative - Florida Red Tide Alliance (2007 - present)
- Co-Chair - Florida Harmful Algal Bloom Task Force Technical Panel on Public Health (2005 - 2011)
- Florida Harmful Algal Bloom Task Force Technical Panel on Inter-laboratory Methods Development (2006 - 2011)
- Member - National HAB Committee on Education and Outreach (2007 - 2011)
- Reviewer - NOAA Center for Sponsored Coastal Ocean Research (CSCOR) Program
- Reviewer – Elsevier Publications: Remote Sensing of Environment
- Reviewer – National Fish and Wildlife Foundation
- Reviewer – Elsevier Publications: Deep-Sea Research
- Reviewer – Elsevier Publications: Harmful Algae
- Reviewer – Elsevier Publications: Science and the Total Environment

### **Mentorships:**

- University of South Florida College of Public Health  
 Cynthia Jean-Baptiste, 2013
- University of Florida School of Public Health MPH  
 Ross Brooks, 2010  
 Jeremy Faris, 2012
- Florida A and M University School of Public Health MPH  
 Roxie Zarate, 2009  
 Bismark Larbi, 2013  
 Raissa Kouadjo 2015  
 Lauren Izegbu 2015  
 Zenzile Pearson 2015  
 Olasunkanmi Fasakin, 2016
- Florida State University School of Public Health MPH  
 Sonal Patel, 2006  
 Julianna Jones, 2014
- Florida Epidemic Intelligence Service fellow  
 Rebecca Lazensky, 2008
- US Centers for Disease Control and Prevention Public Health Prevention Service Fellow  
 JoEllen DeThomasis, 2006

**Other:**

- FEMA, National Incident Management System IS-00700
- Florida Department of Health Internal Course: Code of Ethics
- HIPAA and Privacy: General Awareness Training
- Florida Department of Health Internal Course: Contract Management
- Florida Department of Health Internal Course: Supervisory/Management Training
- CITI: Collaborative Institutional Training Initiative: Human Research

**Significant Publications:**

- Grattan, L. M., J. Shumacker, **A. Reich** and S. Holobaugh. *Public Health and Epidemiology*. In Harmful Algal Blooms: A Compendium Desk Reference. S.E. Shumway, J.M. Burkholder, and S.L Morton. Wiley-Blackwell. August 2018.
- **Reich, A.R.** *The Whole Gemisch: Public Health Aspects of the Lake Okeechobee, Indian River Lagoon, and the St. Lucie River Harmful Algal Blooms*. Epi Update. Florida Department of Health, Bureau of Epidemiology. Issue 3. 2016
- Radke, E.G., **A Reich**, and J.G. Morris, Jr. *Epidemiology of Ciguatera in Florida*. American Society of Tropical Medicine and Hygiene. 2015. 93(2), 425-432.
- **Reich, A. R.**, Lazensky, J. Faris, L. Fleming, B. Kirkpatrick, S. Watkins, S. Ullman, and K. Kohler. Assessing the Impact of Shellfish Harvesting Area Closures on Neurotoxic Shellfish Poisoning (NSP) Incidence during Florida Red Tide (*Karenia brevis*) Blooms. *Harmful Algae*. 2015; 13-19.
- Kirkpatrick, B., K. Kohler, M. Byrne, LE. Fleming, K. Scheller, **A. Reich**, G. Hitchcock, G. Kirkpatrick, S. Ullman, and P. Hoagland. Human responses to Florida red tides: Policy awareness and adherence to local fertilizer ordinances. 2014. *Science and the Total Environment*. 493:898–909.
- Lazensky, B., **A. Reich**, D. Stanek, and C. Blackmore. Cyanotoxins and the Health Impacts on Pets, Livestock, and Wildlife. *Florida Veterinary Medical Association Advocate*. 2011; 4: 8-11.
- Nierenberg, K, J Hollenbeck, LE Fleming, W Stephan, **A. Reich**, LC Backer, R Currier, and B Kirkpatrick. Frontiers in outreach and education: The Florida red tide experience; *Harmful Algae*. 2011; 374-380.
- Kirkpatrick, B, J Bean, L Fleming, G Kirkpatrick, L Grief, K Nierenberg, **A Reich**, S Watkins and J Naar; Gastrointestinal emergency room admissions and Florida red tide blooms; *Harmful Algae*. 2010; 9, (1): 82-86.
- Kirkpatrick, B, R Pierce, YS Cheng, M Henry, P Blum, S Osborn, K Nierenberg, BA Pederson, L Fleming, **A. Reich**, J Naar, G Kirkpatrick, L Backer and D Baden; *Harmful Algae*; Inland transport of aerosolized Florida red tide toxins; Volume 9, Issue 2, February 2010: 186-189.
- Abbott, G, J Landsberg, **A. Reich**, K Steidinger, S Ketchen, and C Blackmore. Resource Guide for Public Health Response to Harmful Algal Blooms in Florida. Florida Fish and Wildlife Conservation Commission. FWRI Technical Report TR-14. 2009.
- Fleming, L, J Bean, B Kirkpatrick, YS Cheng, R Pierce, J Naar, K Nierenberg, L Backer, A Wanner, **A. Reich**, Y Zhou, S Watkins, M Henry, J Zaias, W Abraham, J Benson, A Cassedy, J Hollenbeck, G Kirkpatrick, T Clarke, and D Baden; Exposure and Effect Assessment of Aerosolized Red Tide Toxins (Brevetoxins) and Asthma; *Environmental Health Perspectives*; July 2009; 117(7): 1095–1100.
- Watkins, S, **A. Reich**, L Fleming, and R Hammond; Neurotoxic Shellfish Poisoning; *Marine Drugs*. 2008; 6(3):431–455.
- Kirkpatrick B, Currier R, Nierenberg K, **Reich A.**, Backer L, Stumpf R, Fleming L, Kirkpatrick G. Florida Red Tide and Human Health: A Pilot Beach Conditions Reporting

System to Minimize Human Exposure. *Science and the Total Environment*. 2008; 10:1016; 1-8.

- Kirkpatrick B, Fleming LE, Backer LC, Bean JA, Tamer R, Kirkpatrick G, Kane T, Wanner A, Dalpra D, Kane T, Wanner A, Dalpra D, **Reich A**, Baden DG. Environmental exposures to Florida red tides: Effects on emergency room respiratory diagnoses admissions. *Harmful Algae* 2006; 5:526-533
- Benson JM, Gomez AP, Statom GL, Tibbetts BM, Fleming LE, Backer LC, **Reich A**, Baden DG. Placental transport of brevetoxin-3 in CD-1 Mice. *Toxicol* 2006; 48(8): 1018-1026.

#### **Grant Awards:**

- *Public Health Strategies for Surveillance of Harmful Algal Blooms (HABs) in Florida*; Cooperative Agreement # U38EH000334; Project Period: September 30, 2008 to September 29, 2013; \$750,000.
- *Expanding Existing Surveillance Systems to Include Pfiesteria, Other Harmful Algal Blooms and Marine Toxins in Florida*; Centers for Disease Control and Prevention (CDC); Grant #U50-CCU423360-01; September 30, 2004 September 29, 2008; \$4,856,745.
- *Harmful Algal Bloom Response Plans*; Florida Department of Environmental Protection; June 2008 to May 2013; \$125,000.
- *Aquatic Toxins Hotline through Florida Department of Health/Florida Poison Information Center-Miami*; Florida Fish and Wildlife Conservation Commission Grant #07173; November 2007 through June 2009; \$160,000.
- *Monitoring and Forecasting Cyanobacterial Blooms for Public Health Protection and Response*; NASA/NOAA 08-DEC08-39; January 2010 through January 2013; \$ 480,000
- *Modeling the Dynamics of Harmful Algal Blooms, Human Communities, and Policy Choices Along the Florida Coast*; National Science Foundation; Coupled Natural and Human Systems (CNH) Program; October 2010 through September 2015; \$150,000.
- *Improved Forecasts of Respiratory Illness Hazard from Gulf of Mexico Red Tide*; National Aeronautics and Atmospheric Administration through sub-award from Texas A&M University; June 2015 through June 2018; \$89,997.

#### **Significant Professional Presentations:**

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- *Role of Environmental Toxicology in Protection of Public Health*, University of South Florida School of Public Health. July 6, 2018.
- *Florida Department of Health's Response to Harmful Algal Blooms*, National Poison Control Centers – Community of Practice. March 4, 2018.
- *Current Topics in Environmental Toxicology*, Florida Department of Health in Hillsborough County. November 7, 2017.
- *Public Health Toxicology*, County Health Department Leadership Series. Sept 2017.
- *Aquatic Toxins and Their Impact on Public Health -- Food safety issues in fish and seafood*, American College of Veterinary. Preventive Health Medicine. March 2017.
- *Aquatic Toxins and their Impacts on Public Health*. Florida Environmental Health Association Annual Educational Meeting. Sarasota, Florida. July 13, 2016.
- *Florida Department of Health's Aquatic Toxins Program*. Environmental Protection Agency (EPA) Region 5 Harmful Algal Bloom/Clean Water Act/Safe Drinking Water Act Workshop and Public Meeting. Chicago, Illinois. April 27, 2016.
- *Florida Onsite Sewage Nitrogen Reduction Strategies*. Florida Realtors Association Legislative Strategy Meeting. September 15, 2015.

- *Historic Importance of Environmental Health: Curators Tour.* Florida Historic Capitol Museum. Tallahassee, Florida. March 20, 2015.
- *Making a Difference: The Integrated Ocean Observing System – Red Tide Public Health Response in Florida.* US Congressional Briefing, Rayburn House Office Building. Washington, DC. February 26, 2015.
- *Remote Sensing for Harmful Algal Bloom Detection, Response and Protection: Public Health Applications.* Remote Sensing Harmful Algal Bloom Workshop. Chesapeake and Coastal Bays Region. Baltimore, Maryland. May 1, 2014.
- *Assessing the Impact of Shellfish Harvesting Area Closures on Neurotoxic Shellfish Poisoning (NSP) Incidence during Florida Red Tide (Karenia brevis) Blooms.* Charlotte Harbor National Estuary Program. Punta Gorda, Florida. March 26, 2014.
- *Harmful Algal Blooms and the CDC National Outbreak Reporting System.* US Centers for Disease Control and Prevention Workshop. Atlanta, Georgia. March 19, 2014.
- *Assessing the Impact of Shellfish Harvesting Area Closures on Neurotoxic Shellfish Poisoning (NSP) Incidence during Florida Red Tide (Karenia brevis) Blooms.* 7<sup>th</sup> National Symposium on Harmful Algae in the US. Sarasota, Florida October 29, 2013
- *Indian River Lagoon and its Impact on Public Health.* Central Florida Public Health Coalition. Brevard County, Florida. September 19, 2013
- *Florida Department of Health's Aquatic Toxins Program: Responding to Public Health Impacts from Harmful Algal Blooms.* Summer Webinar Series to Build Awareness About Harmful Algal Blooms and Nutrient Pollution. US EPA. July 25, 2013.
- *Florida's Public Health Surveillance Strategies for Detection of Cyanobacteria-related Illness.* Human Health Risks Associated with Cyanobacteria Exposure. US Environmental Protection Agency. International Webinar. May 22-23, 2013. [www2.epa.gov/nutrient-policy-data/human-health-risks-exposure-cyanotoxins-` webinar](http://www2.epa.gov/nutrient-policy-data/human-health-risks-exposure-cyanotoxins-webinar).
- *Florida's Public Health Protection Strategies for Cyanobacteria and their Toxins;* California State Water Resources Control Board, Oakland, California. November 28, 2012
- *Florida's Public Health Protection Strategies for Cyanobacteria and their Toxins;* Florida Department of Environmental Protection South District, Ft. Myers Florida. August 7, 2012
- *With a Little Help from our Friends ...* Workshop on Cyanobacteria and Cyanotoxins: Occurrence and Detection Methods. US EPA. Webinar. July 30, 2012.
- *Ciguatera Fish Poisoning: Bringing Reporting into Modern Public Health Surveillance and Investigations.* 6<sup>th</sup> Symposium on Harmful Algal in the US. Austin, TX. Nov. 2011.
- *Public Health Impacts from Harmful Algal Blooms in Florida;* Riverview High School; Webinar Broadcast; October 3, 2011.
- *Responding to Public Health Impacts from Harmful Algal Blooms;* Palm Beach County Health Department In-Service Education, West Palm Beach, Florida. June 3, 2011.
- *HAB Risks in Florida: Developing Appropriate Public Health Response Strategies;* National Shellfisheries Association 103<sup>rd</sup> Annual Meeting, Baltimore, MD; March 2011.
- *Monitoring and Forecasting Cyanobacterial Blooms for Public Health Protection and Response: FDOH Collaboration with the NOAA and CDC;* St Johns River Technical Advisory Council, Jacksonville, Florida. September 28, 2010.
- *Florida Department of Health's Aquatic Toxins Program: Public Health Response.* Georgia Coastal Managers Meeting, Brunswick, Georgia, August 30, 2010.
- *Public Health Application of CDC's Harmful Algal Bloom Illness Surveillance System;* CDC National Environmental Public Health Conference; Atlanta, Georgia; October, 2009
- *Public Health Surveillance of Illnesses Related to Harmful Algal Blooms: Florida's Experience.* 5<sup>th</sup> National HAB Symposium; Ocean Shores, WA. Nov. 2009.
- *CyanoHAB Risks in Florida: Developing Appropriate Public Health Response Strategies;* CDC National Environmental Public Health Conference; Atlanta, Georgia; October, 2009

- *Public Health Surveillance of Illness related to Harmful Algal Blooms: Florida Experience*; Poster; Council of State and Territorial Epidemiologists; Buffalo, New York; June 2009
- *HABs and Public Health: Federal and State Perspectives*. Gulf of Mexico Coastal Ocean Observing System (GCOOS)/ Gulf of Mexico Alliance (GOMA) Workshop; St. Petersburg, April 21-23, 2009.
- *Florida Red Tide and Public Health: Importance of the Volunteer Phytoplankton Monitoring Network*; NOAA Center for Coastal Environmental Health and Biomolecular Research training at FSU Marine Laboratory, Turkey Point, FL; March 12, 2009.
- *Water Quality and Public Health: Where is the Information?* Gulf of Mexico Coastal Ocean Observing System, Recreational Boaters Workshop; St. Petersburg, Florida February 4, 2009.
- *Florida Department of Health's Aquatic Toxins Program: Assessing Public Health Impacts from Harmful Algal Blooms*; University of Florida College of Public Health and Health Sciences, Gainesville, Florida; February 2, 2009.
- *Public Health Implications of Harmful Algal Blooms*; University of Florida Fisheries Program, Gainesville, Florida; November 7, 2008.
- *Harmful Algal Blooms in Florida: Tools for Surveillance*; Inaugural Coordination Workshop; US Centers for Disease Control and Prevention; Atlanta, GA; Oct.2008.
- *Florida's Aquatic Toxins: Role of Environmental Laboratories in the Evaluation of Health Risks*; Florida Society of Environmental Analysts; Palm Beach Gardens, FL; October 2008.
- *Blue-green Algae and Cyanotoxins: Tools for Evaluation and Response*; Florida Department of Environmental Protection Annual Meeting, Orlando, Florida; August 2008.
- *Harmful Algae Bloom Public Health Response Plans: From Theory to Implementation*; FI Environmental Health Association 60th Annual Meeting; Palm Beach, FL; Aug 2008.
- *Public Communication for Harmful Algal Blooms: A State Health Department Perspective*; at Harmful Algal Blooms in the Mid-Atlantic; University of Delaware Sea Grant College Program; April 2008.
- *Human Health Effects of Marine Toxins: Current Aerosolized Florida Red Tide Research*; Ocean Science Meeting, Orlando, Florida; March 2008.