

Expanded Environmental Monitoring in Support of Epidemiologic Investigation on Health Effects of Florida Red Tide

Conducted for the

Aquatic Toxins Program
Division of Environmental Health
Florida Department of Health

under

US Centers for Disease Control and Prevention
Grant #U50-CCU423360-01

by

Mote Marine Laboratory
Sarasota, Florida

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Mote Marine Laboratory Personnel

- **Richard Pierce, Ph.D. Principal Investigator**
- **Michael Henry, BS Chemist, Field and Lab coordinator**
- **Patricia Blum, AA Biologist, Field sampling, sample processing and analyses.**

**University of North Carolina, Wilmington,
Center for Marine Science:**

Collaborators for sample collection and ELISA analyses.

- **Jerome Narr, Ph.D. Co-PI. ELISA assay for brevetoxin analysis**
- **Susan Campbell, BS, Field sampling, processing and analyses**
- **Allison Weidner, BS, Field sampling, processing and analyses.**

Lovelace Respiratory Research Institute:

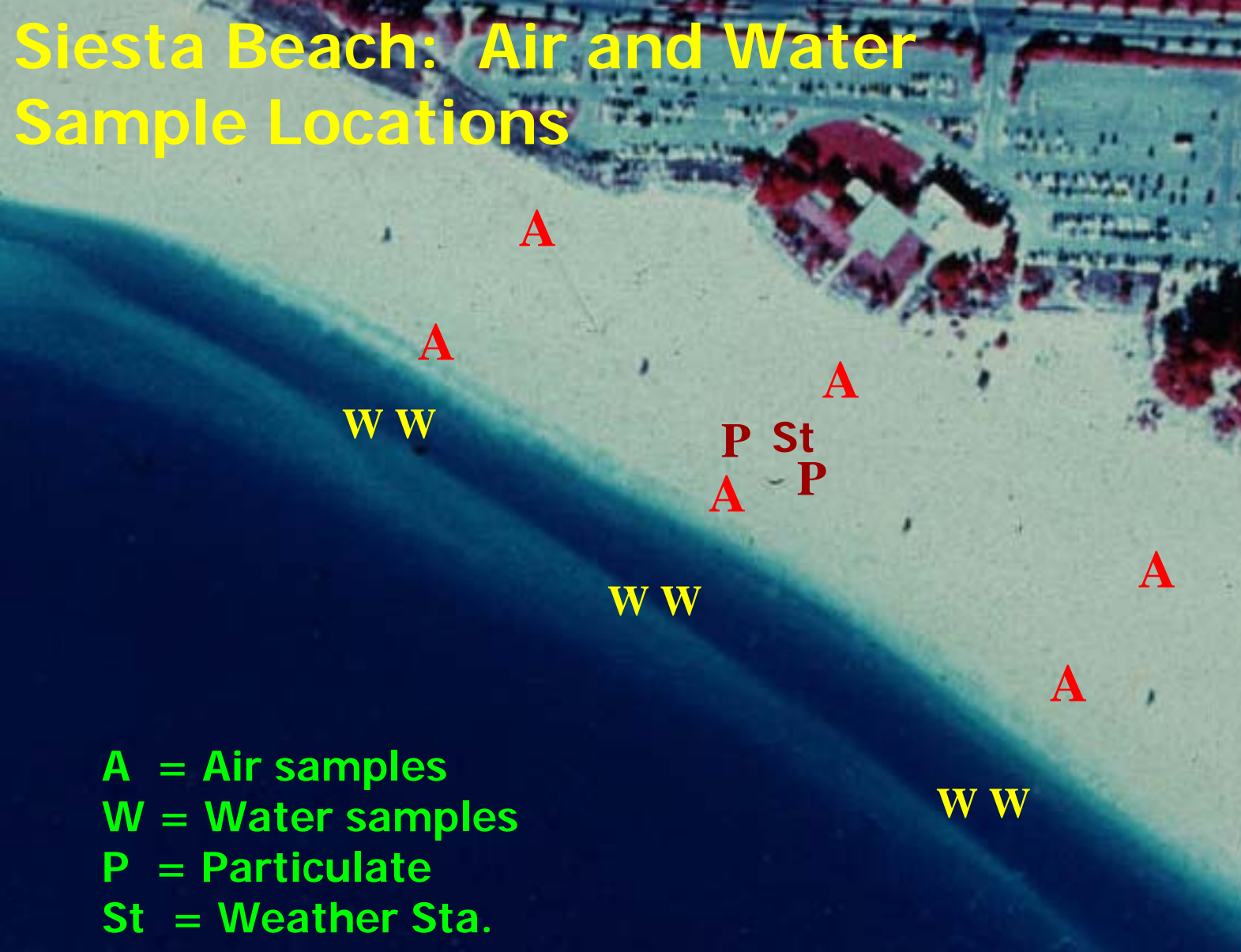
Collaborators for personal air samplers, aerosol particle-size and brevetoxin analyses.

- **Yung Sung Cheng, Ph.D. Co-PI**
- **Yule Shout, Ph.D. Field sample collection and data processing.**
- **Brad Tibbets, BS Field Sample collection and sample processing.**

Objectives

- **To provide baseline data for brevetoxins in surf water and marine aerosol in the absence of a red tide bloom, in preparation for an exposure study in the presence of a red tide.**
- **To provide assessment of relationship with symptoms of respiratory function impairment from human exposure to marine aerosol in the absence and subsequently the presence of aerosolized brevetoxins.**

Siesta Beach: Air and Water Sample Locations



A = Air samples
W = Water samples
P = Particulate
St = Weather Sta.

High-Volume Air Sampler

Weather Station and Water Sampling



Water Samples: 3 sets/day
Six, 1-L samples: (total = 18/day)
Collected 9:00AM; Noon; 3:00PM
K. brevis Cell counts
PbTx analyses; LC-MS and ELISA

Aerosol Samples: 3 sets/day
- Six High-Volume Air Samplers:
Sample time 9:00 AM to Noon
Noon to 3:00 PM and 3:00 to
6:00PM. (Total = 18/day)
- Analyses; LC-MS and ELISA

-Two Particle-Size Impactors
Sample Time; All Day
-Analyses; LC-MS and ELISA

Toxin Aerosol Collection: High Volume Air Sampler



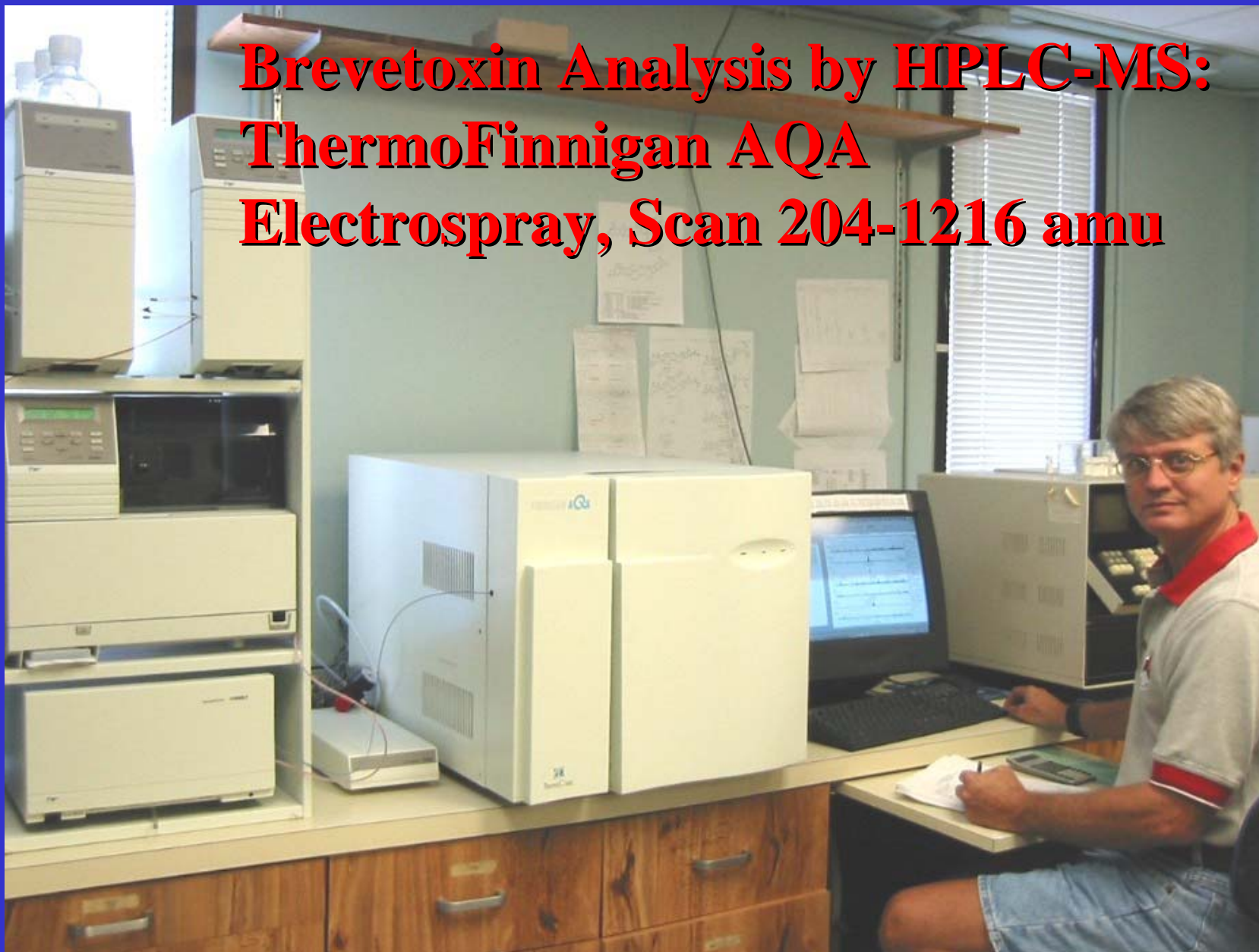
Brevetoxin Extraction from Air Filters



Brevetoxin recovery from water on C-18 discs



**Brevetoxin Analysis by HPLC-MS:
ThermoFinnigan AQA
Electrospray, Scan 204-1216 amu**



Findings

- No *Karenia brevis* cells in the water along the beach.
- No brevetoxins in water along the beach
- No brevetoxins detected in marine aerosol.

Public Health Significance

- No brevetoxins in water or marine aerosol to cause public health effects
- Baseline for future exposure studies.

Future Ongoing and Planned Research Projects and Collaborations

- **Future plans include repeating the complete set of studies in the presence of a red tide bloom along Siesta Beach, Florida, to provide assessment of relationships between human respiratory problems and exposure to aerosolized brevetoxins**

Project Assistance for Centers for Disease Control and Prevention (CDC), Florida Department of Health and environmental public health sciences:

- The impact of aerosolized neurotoxins (brevetoxins) on human respiratory function is surmised from anecdotal information.**
- This study provides the actual dose and composition of brevetoxins to which humans are exposed in the absence and subsequently in the presence of a natural red tide bloom.**

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by the

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