



2013-14 STATE WIDE PESTICIDE SAMPLING PILOT PROJECT



**PRESENTATION OF PRELIMINARY FINDINGS
TO THE
2014 2ND ANNUAL JOINT GOVERNMENT
WATER QUALITY CONFERENCE
HONOLULU, HAWAII
AUGUST 11, 2014**

**FENIX GRANGE
HAZARD EVALUATION AND EMERGENCY RESPONSE OFFICE
HAWAII STATE DEPARTMENT OF HEALTH**

Background



Growing citizen concern about off site movement of pesticides from large agricultural operations

Information needed. State does not have a surface water monitoring program for pesticides.

DOH and HDOA partnered to develop pilot study

CWB and USGS provided expertise and fieldwork

Pilot Project Partners and Funding



Special Funds used to support this pilot project

- HDOH provided \$25,000 from the ERRF
- HDOA provided \$25,000 funding from the Pesticide Use Revolving Fund

We contracted with USGS to provide services

- USGS provided matching funds of \$45,000 from their Cooperative Water Program

USGS Studies on Oahu



Ground-Water Quality and its Relation to Land Use on Oahu, Hawaii, 2000–01

U.S. Department of the Interior
U.S. Geological Survey
Water-Resources Investigations Report 03-4305



Distribution of volatile organic compound mixtures in ground water.

NATIONAL WATER-QUALITY ASSESSMENT PROGRAM



Water Quality on the Island of Oahu Hawaii, 1999–2001



U.S. Department of the Interior
U.S. Geological Survey

Circular 1239

USGS Studies on Oahu



Study on Oahu in 2000-2001 showed a clear connection between land use and pesticide detections in streams and ground water

Urban areas and agricultural areas had very different “fingerprints”

Residues of pesticides used on sugar cane, pineapple and golf courses detected in ground water and surface water

Multiple household pesticides detected in urban streams

Drinking Water Pesticide Data on Oahu



Public Drinking Water Supplies

- Required regulatory monitoring for pesticides, other contaminants
- Atrazine - historic and current detections
- Detections remain of banned pesticides including, dieldrin, chlordane, heptachlor epoxide, 1,2 dichloro, 3- propane (DBCP), ethylene dibromide (EDB), 1,2,3 trichloropropane in fumigant Telone II.

Study Design



- Compare land uses with differing pesticide practices
- Small perennial streams or water bodies
- Winter sampling, dry period
- One time “snapshot” sampling– not representative of average conditions or other times of year
- Looks for broad range of currently used pesticides– 136 different compounds in water, 121 in sediments
- Very low detection limits

Study design – Sample Numbers



- 24 sites statewide for water samples, 8 on Oahu
- 7 sites added bed sediment testing, 2 on Oahu
- 7 sites added glyphosate sampling, 2 on Oahu

Study Goals



- Gather initial data about currently used pesticides in streams immediately downstream of pesticide uses
- Compare results to regulatory standards
- Look for patterns connecting pesticides with land uses
- Share draft report with local farmers and communities and listen to their perspectives
- Identify local concerns
- Help communities understand regulatory roles and available assistance
- Collaborate on steps forward

Data Evaluation



- **Compare to regulatory standards**
 - - State and Federal Ambient Water Quality Criteria
 - - EPA Level of Concern (LOC)
- **MCLs not directly applicable, but useful**
- **Use other EPA eco and human health benchmarks to interpret concentrations below standards**
- **EPA OPP Aquatic Life Guidelines – set using the “No Effect” concentration for the most sensitive species tested, including algae, invertebrates and fish**

Key Findings Statewide



- No currently used pesticide exceeded water quality standards.
- No currently used pesticide exceeded drinking water standards.
- Dieldrin, a banned termite treatment, exceeded WQS in 3 urban streams on Oahu.
- Every location sampled statewide had a trace detection of one or more pesticides, most were trace concentrations below federal benchmarks for human health and ecosystems.
- Glyphosate sampled in water and sediments at 7 locations statewide. Found at all locations across land uses.

Key Findings Statewide –Urban Sites



- Land use significantly impacted the number and type of pesticides detected. Urban areas on Oahu showed the highest number of different pesticides.
- Urban streams showed many general, home use pesticides, and some restricted use pesticides.
- Three Oahu streams exceeded an aquatic life benchmark for insecticides, either fipronil or cyfluthrin.

Key Findings Statewide – Atrazine



- **Atrazine, a restricted use pesticide, was the most commonly found pesticide statewide at 20 of 24 locations. Two sites, one on Kauai, and one on Maui, reflected elevated concentrations suggestive of current use of atrazine. All of the remaining detections were trace level concentrations far below state and federal benchmarks.**

Key Findings Statewide – Agricultural Sites



- Atrazine and metolachlor, two restricted use herbicides, were detected at one location on Kauai at levels that exceeded aquatic life guidelines, but remain below regulatory standards.
- Two seed crop locations on Kauai had detections of 11 different compounds, second only to Oahu urban sites
- Small, mixed use ag had fewer detections

Study Limitations



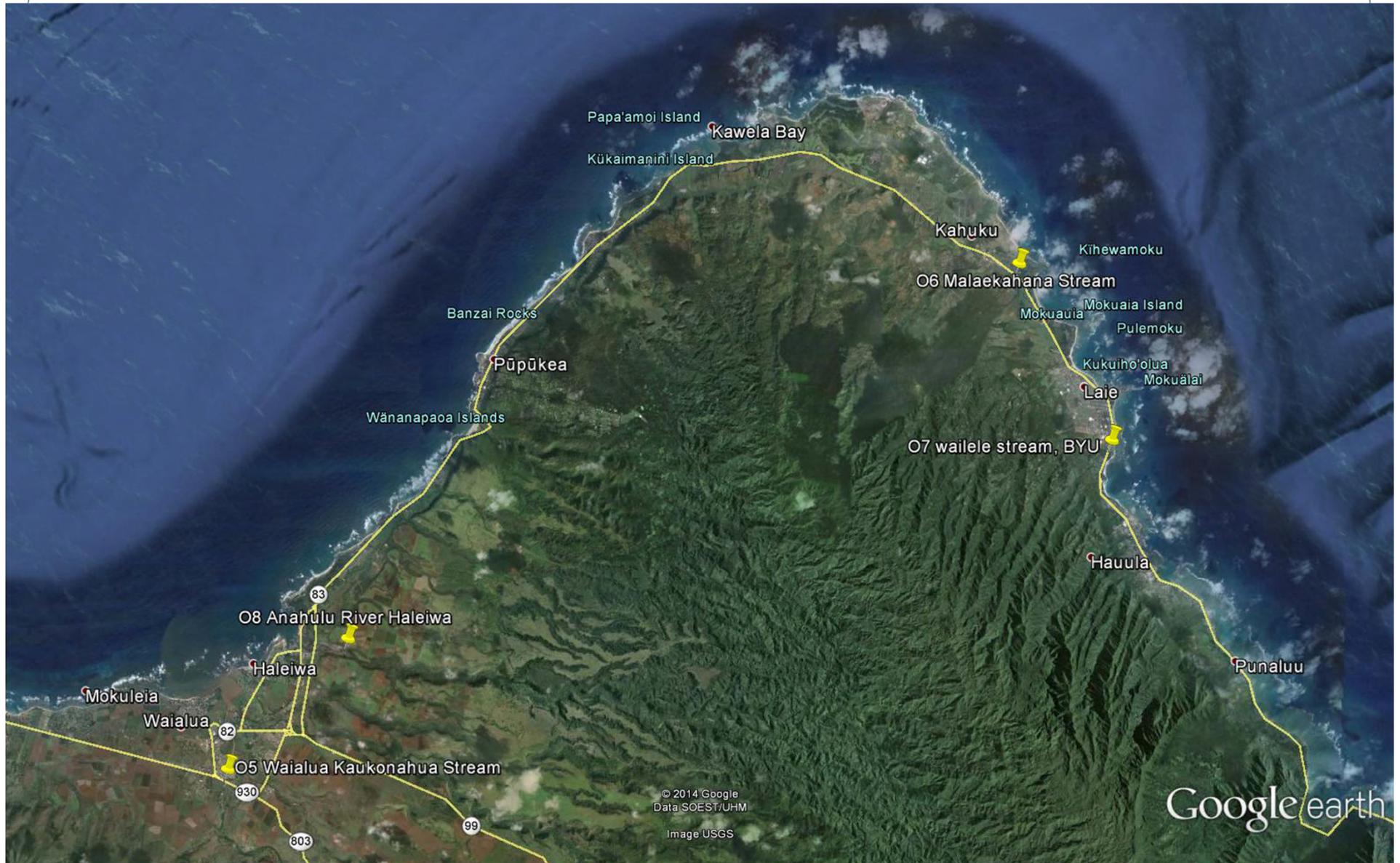
- One time sampling results can't assess risk
- Local pesticide applications not known
- No appropriate stream sites for sampling on Maui and Molokai and in some active agricultural areas
- Variations between sites - streams, drainage canals, anchialine ponds and wetlands
- Multiple upstream users – sampling cannot definitively identify source
- Historic impacts to groundwater may effect results

Oahu Detection Summary



- **24 different pesticides, and 8 breakdown products**
 - 14 herbicides – 4 restricted use
 - 5 insecticides – 3 general use, 1 restricted use, 1 banned
 - 5 fungicides – all general use
- **Most Detections – Urban and mixed use sites**
 - Manoa Stream at Kanewai Field – 20 compounds
 - Waialae Iki – 15 compounds includes golf course
 - Waikele – 11 compounds - all land uses

Oahu – North/East Shore Sampling Sites



Oahu Detections by Land Use



- **Mixed crop, small farms (range 3-5 compounds detected)**
 - All sites had traces of atrazine, suggestive of historic use
 - Kaukonahua Stream, Waialua
 - Anahulu River, Haleiwa – includes far upgradient corn crops
 - Malaekahana Stream, Laie
 - Wailele Stream, Laie
- **Golf courses**
 - **Waialae Iki Stream**
 - ✦ 15 detections, 4 herbicides and 1 fungicide not found in other urban streams

Oahu Data Limitations



- No suitable surface water sampling sites for large ag
- No suitable sites for central and west side ag locations
- Glyphosate and sediments only sampled at 3 of 8 locations
- Sampling did not consider application periods
- Multiple upstream users
- Differences between site conditions may have affected results

What are your priorities?

Next Steps



- DOA and DOH partnering to talk with local stakeholders
- Assess groundwater data gaps
- Coordinating with water agencies to plan and protect
- Working with local governments
- Raising awareness about proper use, Integrated Pest Management and safety for workers and communities
- Gathering input about local priorities
- Educating public about agency roles, contacts for pesticide misuse complaints
- Identifying funding options for future actions

Get the Report



- Summary tables, raw data, maps, and other resources to assist stakeholders with interpreting the data are available online at the HEER website.

<http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/statewide-pesticide-survey>

Just google HEER Hawaii Pesticides

For further information



**Hawaii Department of Health
Hazard Evaluation and Emergency Response Office
808-586-4249**

**Clean Water Branch
808-586-4309**

**Hawaii Department of Agriculture
Pesticides Branch
808-973-9401**