2013-14 State wide Pesticide sampling Pilot Project

PRESENTATION OF PRELIMINARY FINDINGS TO THE 2014 2ND ANNUAL JOINT GOVERNMENT WATER QUALITY CONFERENCE

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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

Previous Studies in Hawaii

USGS 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

Previous Pesticide Studies on Kauai

Public Drinking water Supplies - Ongoing

- Required regulatory monitoring for pesticides, other contaminants
- Historically, atrazine detected in two regulated drinking water systems, at concentrations well below MCL of 3 ppb. No detections in current drinking water supplies.

USDA School Water Sampling

- 1 sample, one trace detection, 0.006 ppb, 500 times below MCL

EPA Monitoring Initiative Surface Water Sampling 2012

- 28 locations on Kauai, 10 common pesticides and wastewater constituents
- Atrazine and carbaryl detected at trace levels (< 0.040 ppb), largely in Nawilliwilli drainage
- Lab methods less sensitive than current study

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 Kauai
- 7 sites added bed sediment testing, 2 on Kauai
- 7 sites added glyphosate sampling, 2 on Kauai

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 – Agricultural Sites

- 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.

- 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.

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

Kauai Detections by Land Use

- Large, single crop agriculture
  - Seed crops (range 5-11 different compounds)
    - 3 drainages between Kekaha and Mana Plain
    - 1 location exceeded aquatic life standards for herbicides, atrazine and metolachlor
    - Glyphosate present in sediments
    - 1 location had a detection of the insecticide chlorpyrifos
  - Wahiawa Stream, coffee and seed crops (4 compounds)
    - 2 restricted use herbicides associated with corn and sugar uses
    - 1 general use herbicide and 1 general use fungicide

Kauai – South Shore and West Side Sampling Sites

Kauai Detections by Land Use

- Mixed crop, small farms
  - Hanalei taro drainage - glyphosate and traces of historic atrazine use
  - Kilauea/Waiakalua on North Shore – traces of historic atrazine use
- Golf course/resort
  - Marriott Lagoons Golf Course – 2 general use herbicides, MCPA and triclopyr
- Integrator Site (multiple land uses present, including seed crops)
  - Hanamaulu - 3 restricted use herbicides, one common home insecticide - fipronil

Kauai – North and East Shore Sampling Sites

Good Neighbor Reporting

- Five restricted use pesticides detected on Kauai at one or more sites with upstream seed corn production
- Good Neighbor Reporting showed use of 2 herbicides, atrazine and metolachlor and 1 insecticide, chlorpyrifos in weeks before sampling
- Two other restricted use herbicides, simazine and hexazinone detected, not applied in reporting period prior to sampling. This may reflect earlier use, or historic residues left from sugar cane applications.

Kauai Data Limitations

- Glyphosate and sediments only sampled at 2 of 8 locations
- One RUP, paraquat, not sampled due to lack of method
- Sampling did not consider application periods
- Multiple upstream users
- Citizen concerns about dust and air transport not addressed
- Differences between site conditions may have affected results
- Urban site (Nawilliwilli Stream) not sampled, so residential uses underestimated

What are your priorities?

Next Steps

- DOA and DOH partnering to talk with local stakeholders
- 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
- Working with local governments to assist
- 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 be available on line 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