J Street Drain Project
Mosquito Technical Study

Prepared by

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In collaboration with

California Department of Public Health
Vector-Borne Disease Section

Purpose of Mosquito Study

- Fully address mosquito-related potential public health impacts resulting from the JSD project
- Respond to SSIII residents' Draft EIR comments

Scope of Study

- Study Purpose
- Background
- Environmental Setting
- Introduction to Mosquitoes
- Vector Control Program Data
- Evaluation of Channel Designs
- Evaluation of Additional Sources
- Overall Evaluation and Conclusions
- Presentation Q&A


Hueneme Rd
West Hueneme Rd
Channel Islands Self Storage
Railroad
Oxnard Wastewater Treatment Plant
Surfside III Condominiums
Oxnard Industrial Drain
Hueneme Pump Station
Halaco Superfund Site
Ormond Beach Lagoon
Perkins Drain
N

Features of the JSD Terminus

- Ormond Beach Lagoon
  - No surface outlet to the ocean due to sand berm
  - Water level in lagoon causes water to back up into JSD
  - Currently backs up as far as ~Hueneme Rd
  - Endangered Species Act prohibits manual breaching due to presence of threatened and endangered species
  - Berm periodically breaches naturally during winter storms

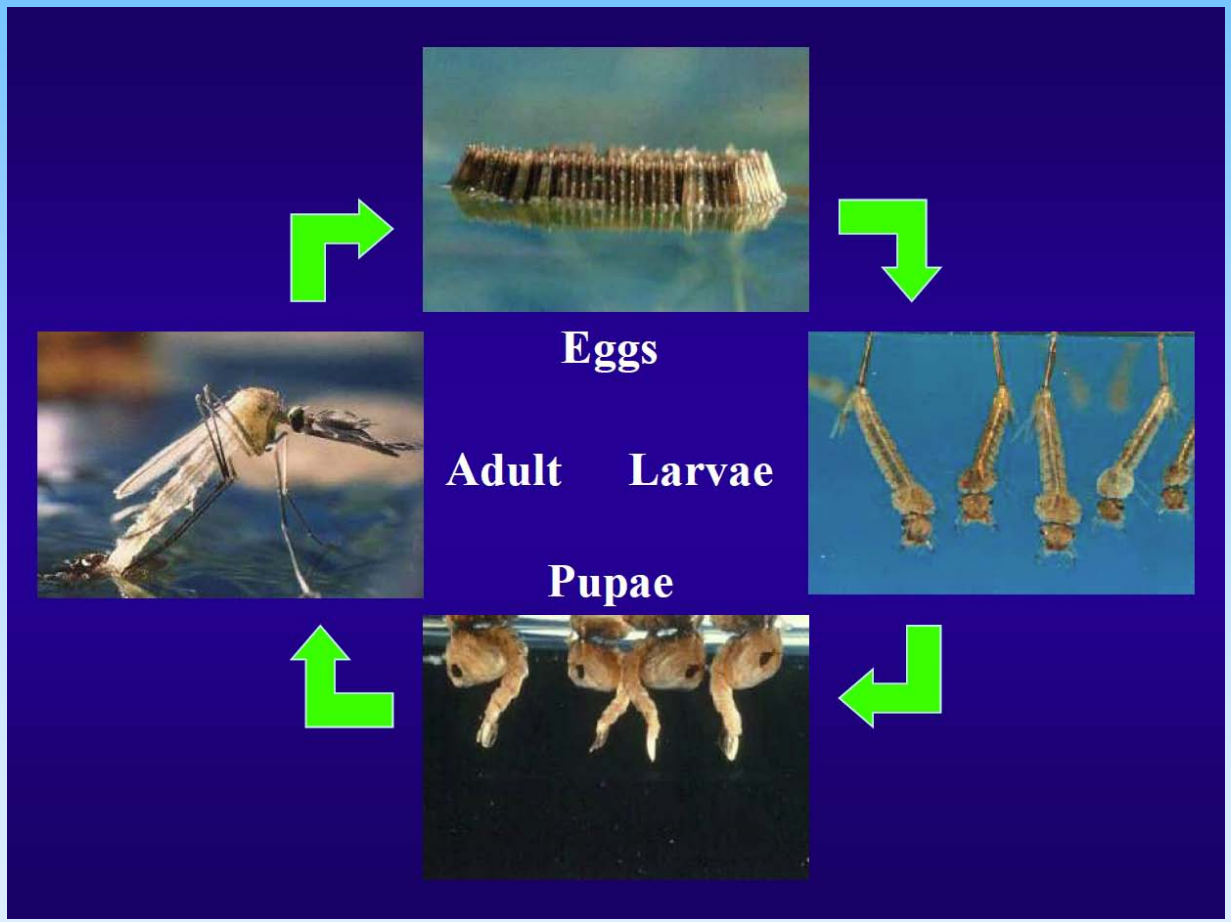
Features of the JSD Terminus

- Hueneme Drain Pump Station
  - Hueneme Drain fed by natural Bubbling Springs
  - Hueneme Drain Pump Station built in 1960's
  - Reconstructed in 2005-2007
  - Hydrology identical before and after reconstruction – same daily flows, forebay size, and standing water

Mosquitoes as a Vector for Disease

- Mosquitoes are vectors for diseases
- Diseases transmitted through bite of infected female mosquito.
- Relatively few infected mosquitoes in the environment.
- In CA, local agencies control mosquito populations to reduce potential for disease and nuisance
- Eradication of all mosquitoes is not possible

Mosquito Life Cycle



- Eggs laid on water
- Larvae and pupae live in water but breathe air through a siphon (no gills)
- Adults emerge from pupae
- Only adult female mosquitoes bite and feed on blood
- In coastal SoCal, production decreases substantially in the cooler winter months

Mosquito Breeding Habitat

- Not all sources of water are conducive to mosquito breeding

Suitable Habitat

- Calm water
- Stagnant water
- Waters with refuge, e.g. emergent or floating vegetation
- Example: wetlands, stagnant swimming pools

Unsuitable Habitat

- Flowing water
- Deep waters with fish
- Waters with surface disturbance from wind and waves
- Example: flowing channels, open lakes

Mosquito Species

- Main biting mosquito species found near JSD
  - *Culex tarsalis* – Opportunistic in many unpolluted waters, disperse a couple of miles
  - *Culex quinquefasciatus* – Opportunistic with affinity for underground and polluted habitats
  - *Culex erythrothorax* – Requires densely vegetated wetlands

Midges

- Strong resemblance to mosquitoes
- Cannot bite and not vectors for disease
- Reproduce in aquatic habitats
- Larvae do not require atmospheric oxygen – can breed where mosquitoes cannot
- Often hatch in blooms, are attracted to lights, and rest on structures, becoming nuisances

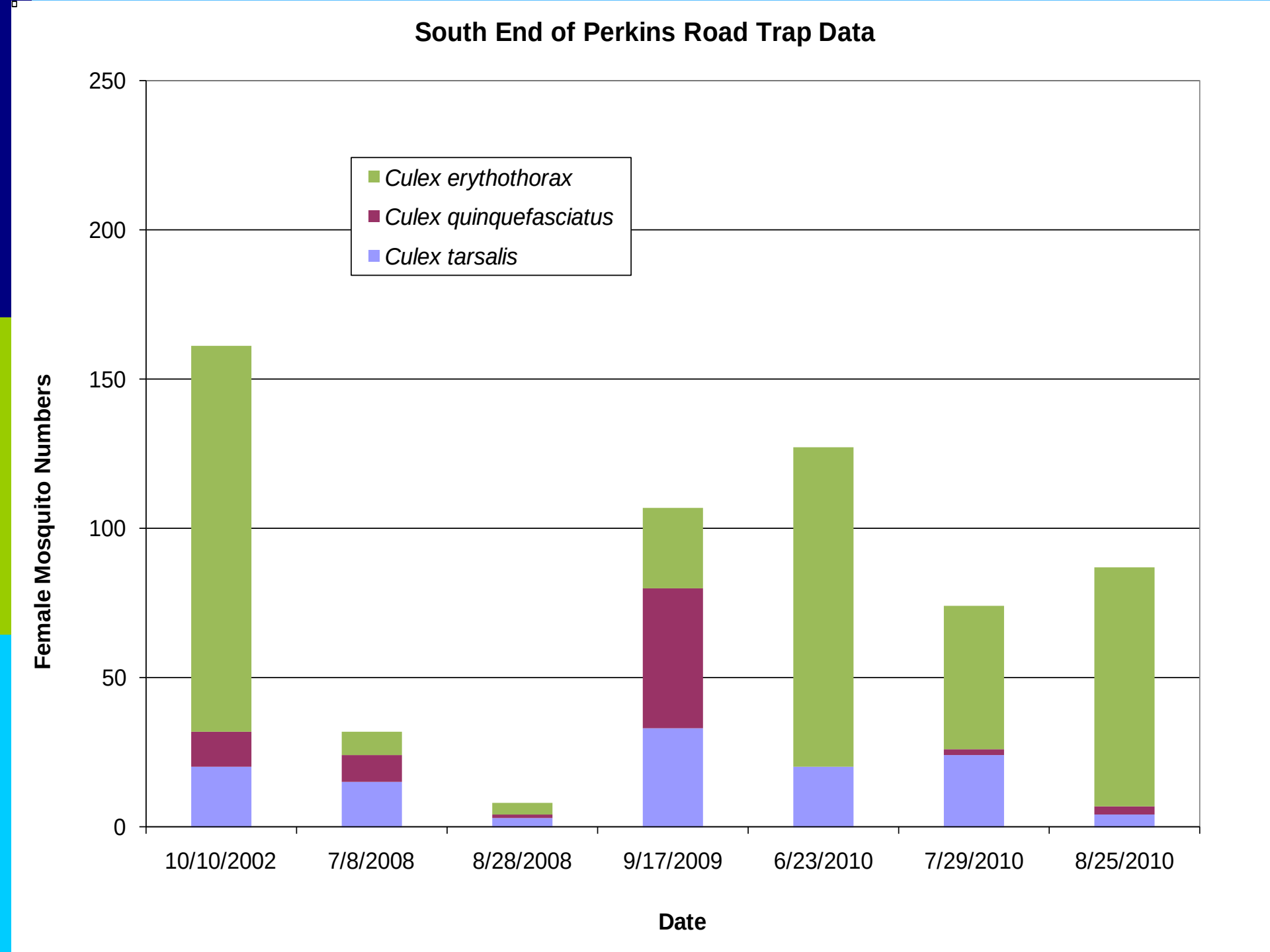
Mosquito →

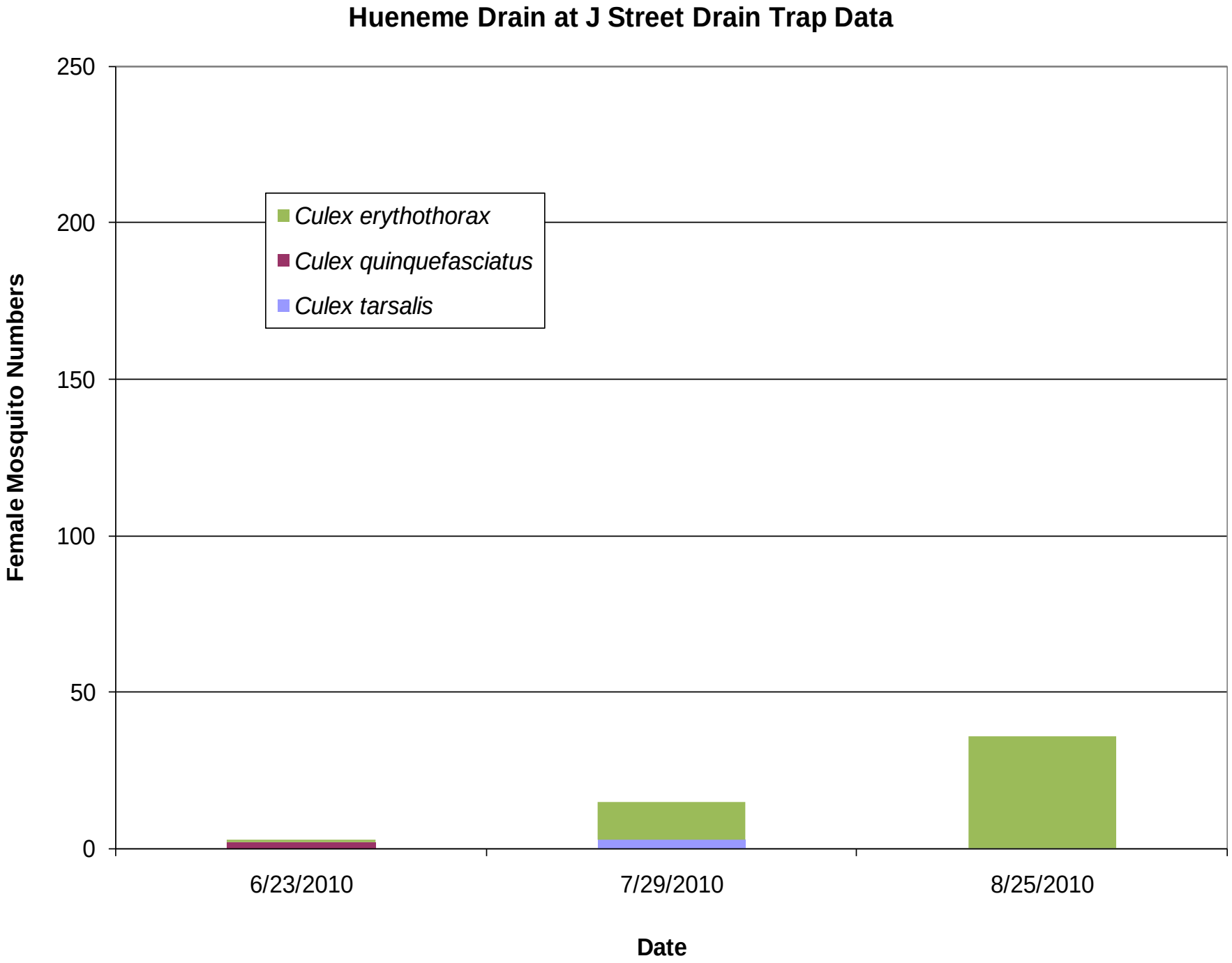
← Midge

Adult Mosquito Surveillance

- VCVCP uses adult mosquito traps as part of comprehensive program
- With limited resources traps deployed in areas of greatest concern
- Traps generally deployed June-October when mosquitoes are most active
- Increased trap use in JSD area in 2008-2010 in response to nuisance complaints


Port Hueneme
E Port Hueneme Rd
W Hueneme Rd
J Street Drain near Hueneme Road
Hueneme Drain at Railroad Tracks
SSIII
South End of Industrial Avenue
Surfside III
Hueneme Drain Section E
Hueneme Drain at J Street Drain
West End of McWane Boulevard
South End of Perkins Road
J Street Drain
Image © 2010 DigitalGlobe


South End of Perkins Road Trap Data
250
200
150
100
50
0
Female Mosquito Numbers
Culex erythothorax
Culex quinquefasciatus
Culex tarsalis
10/10/2002
7/8/2008
8/28/2008
9/17/2009
6/23/2010
7/29/2010
8/25/2010
Date


Hueneme Drain at J Street Drain Trap Data
250
200
150
100
50
0
Female Mosquito Numbers
Culex erythothorax
Culex quinquefasciatus
Culex tarsalis
6/23/2010
7/29/2010
8/25/2010
Date


Port Hueneme
E Port Hueneme Rd
W Hueneme Rd
J Street Drain near Hueneme Road
Hueneme Drain at Railroad Tracks
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South End of Industrial Avenue
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West End of McWane Boulevard
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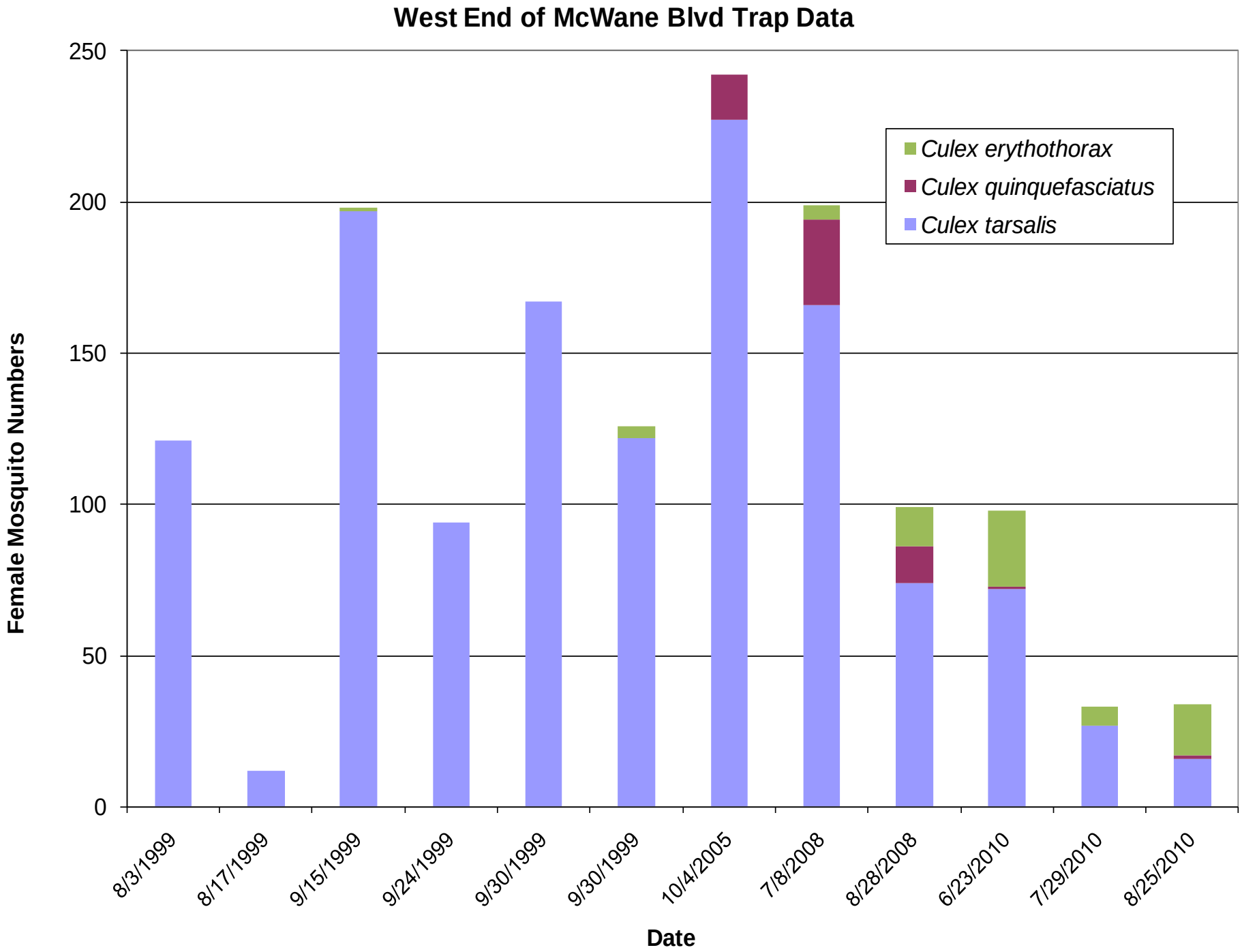
J Street Drain
Image © 2010 DigitalGlobe


West End of McWane Blvd Trap Data
Female Mosquito Numbers
250
200
150
100
50
0
Culex erythothorax
Culex quinquefasciatus
Culex tarsalis
8/3/1999
8/17/1999
9/15/1999
9/24/1999
9/30/1999
9/30/1999
10/4/2005
7/8/2008
8/28/2008
6/23/2010
7/29/2010
8/25/2010
Date


Port Hueneme
E Port Hueneme Rd
W Hueneme Rd
J Street Drain near Hueneme Road
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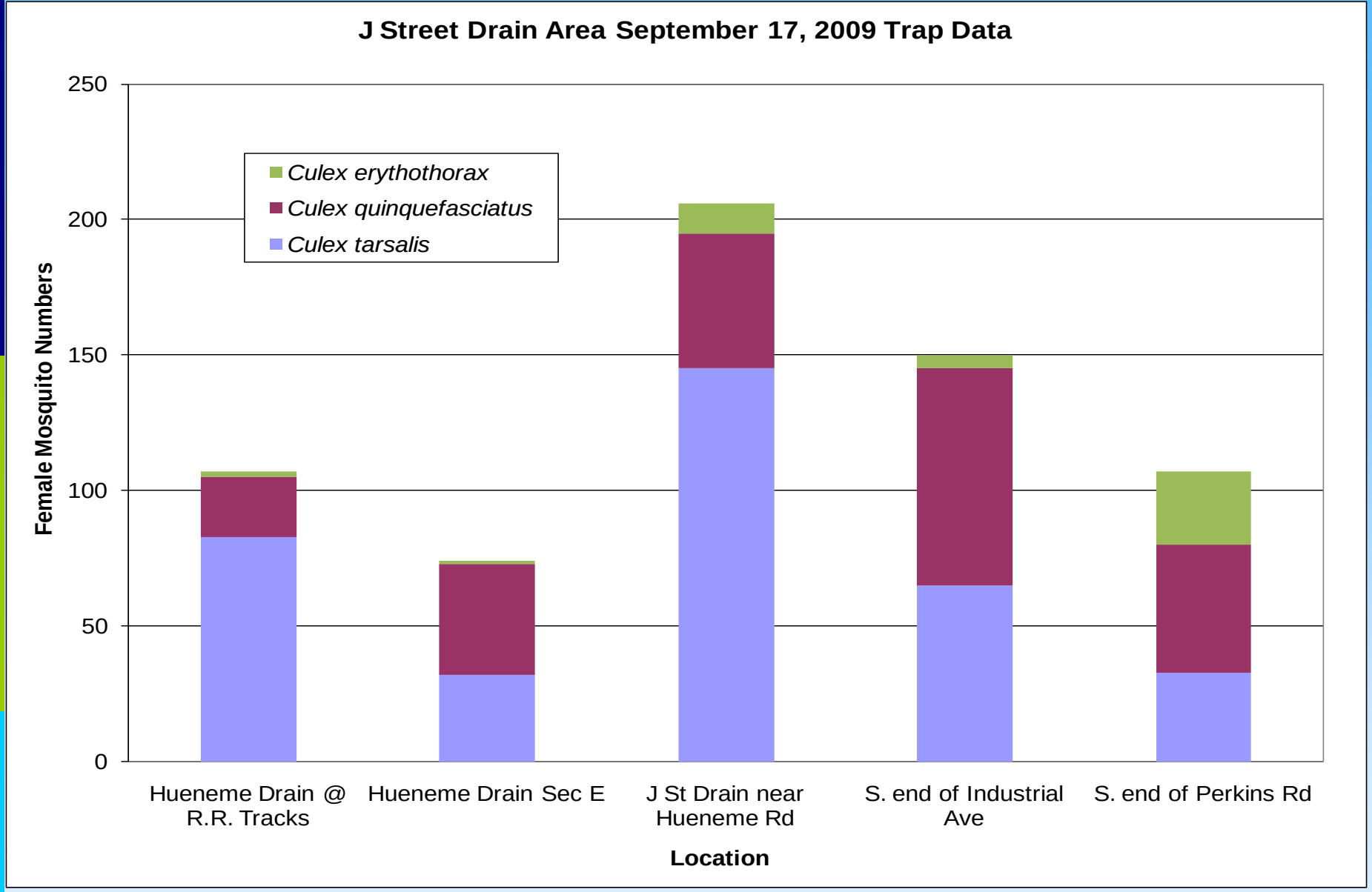
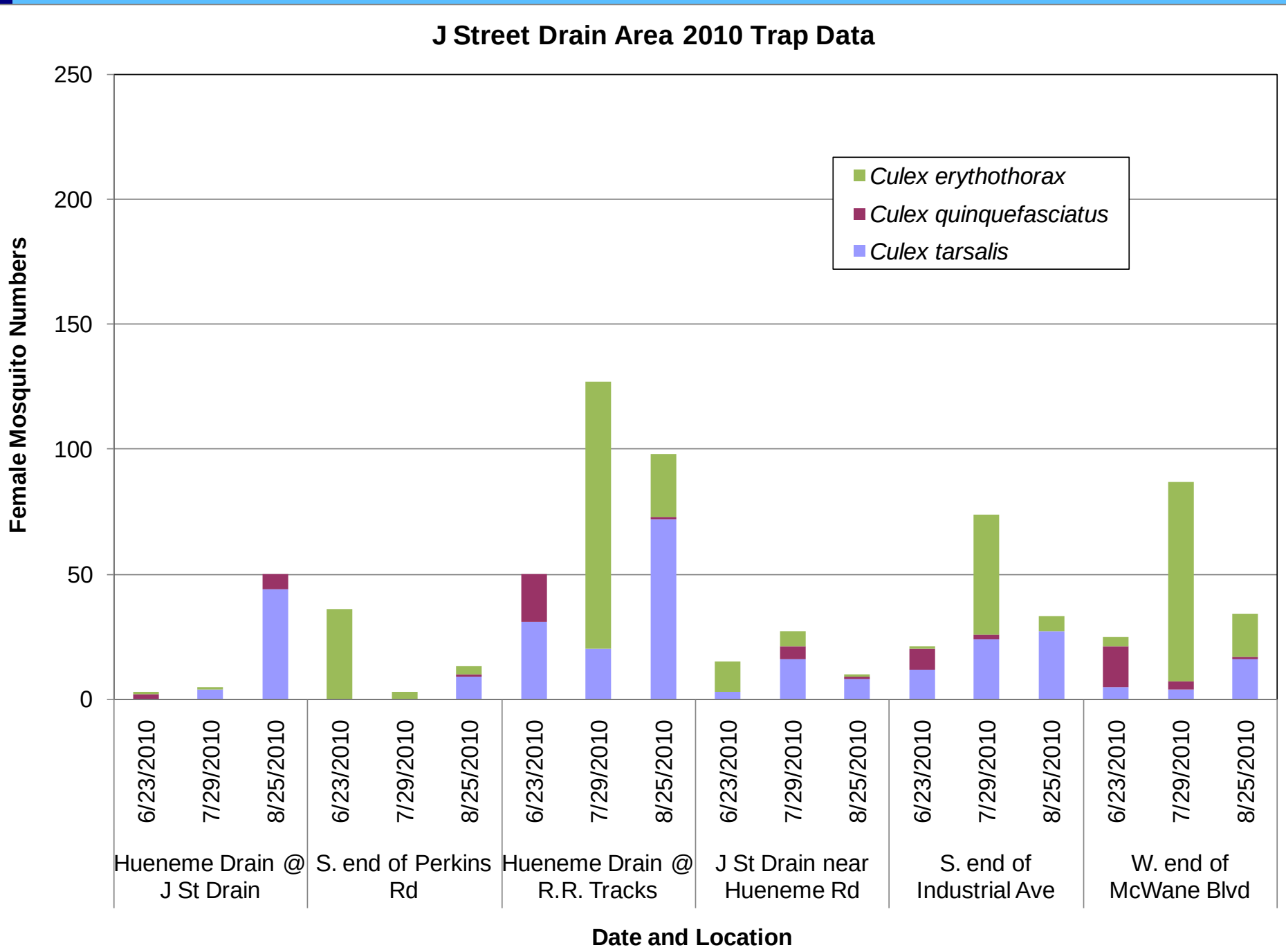
Image © 2010 DigitalGlobe


J Street Drain Area September 17, 2009 Trap Data
250
200
150
100
50
0
Female Mosquito Numbers
Culex erythothorax
Culex quinquefasciatus
Culex tarsalis
Hueneme Drain @ R.R. Tracks
Hueneme Drain Sec E
J St Drain near Hueneme Rd
S. end of Industrial Ave
S. end of Perkins Rd
Location


J Street Drain Area 2010 Trap Data
Female Mosquito Numbers
250
200
150
100
50
0
Culex erythothorax
Culex quinquefasciatus
Culex tarsalis
6/23/2010
7/29/2010
8/25/2010
Hueneme Drain @ J St Drain
S. end of Perkins Rd
Hueneme Drain @ R.R. Tracks
J St Drain near Hueneme Rd
S. end of Industrial Ave
W. end of McWane Blvd
Date and Location

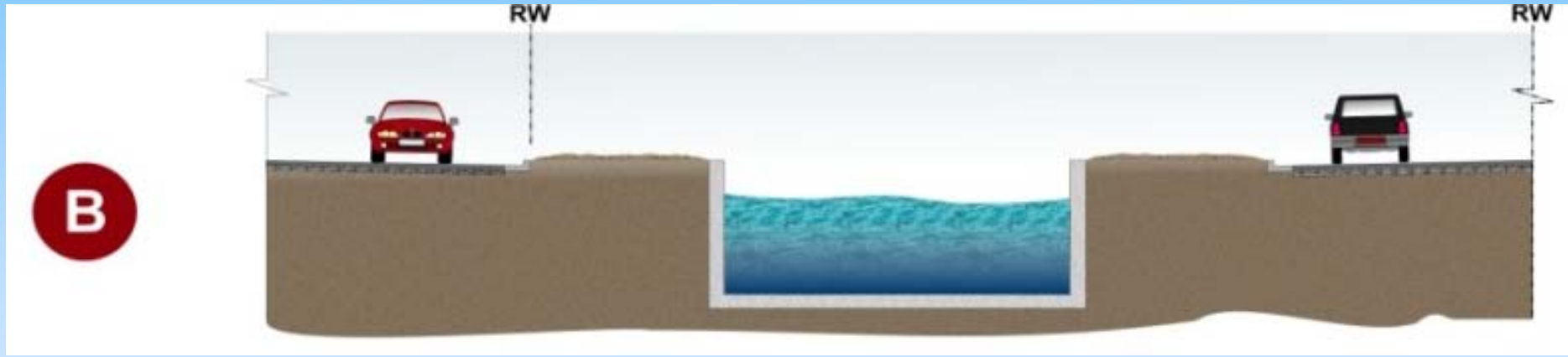
Channel Design for Mosquito Control

- Minimize shallow, sheltered, standing water with vegetative cover, belowground sources
- Additional effective design characteristics include:
  - Flowing water
  - Steep sides to inhibit emergent vegetation growth
  - Deep areas where natural predators can live
  - Open areas of water that allow for water surface disturbance from wind, waves, and fish
  - Proper access for mosquito treatment and vegetation management.

Evaluation of Current J St Drain

- Concrete and steep sides inhibit vegetation
- Wide, open, windy surface with no refuge
- Depth supports numerous fish
- Open channel allows for safe and easy maintenance, monitoring, and treatment
- Does not currently provide suitable habitat to support large mosquito populations

Proposed J Street Drain



Evaluation of Proposed J St Drain

- Proposed changes to channel amplify channel's negative effects on mosquito breeding
- Vertical walls most desirable to prevent cover
- Deeper channel provides better habitat for fish
- Wider channel creates more wind/wave action
- Will not reduce ease or safety of access

Evaluation of Proposed J St Drain

- Breach condition not expected to increase breeding
- Remaining water provides same lack of habitat suitability
  - Vertical walls, lack of vegetation, deep water, wind/wave action
- Some fish would remain
- Mosquito production decreased in cooler wet season months
- Shallow margins would provide best potential habitat, but are easily accessible and treatable

Alternative A

Evaluation of Additional Alternative

- Proposal to pump standing water out of JSD
  - Would not provide 100-year storm capacity
  - Regulatory feasibility
- Pumping would be unable to eliminate all water
- Remaining wet areas excellent habitat
- Require additional maintenance, monitoring and treatment
- Negative impact

Additional Sources

- Ormond Beach Lagoon
- OWWTP
- Hueneme Drain/ Bubbling Springs
- Hueneme Drain Pump Station
- Other Open Space Sources
- Other Urban Sources

Images of Urban Sources



Overall Evaluation & Conclusions

- Ormond Beach Lagoon primary source of mosquitoes in immediate area
- The undeveloped floodplain of OID and urban areas may produce substantial mosquitoes
- New sources at OWWTP in 2009 were identified and addressed
- Evidence suggests current JSD, Hueneme Drain, and Hueneme Drain Pump Station provide poor mosquito habitat
- Proposed project would have no expected change to public health with regard to mosquito production

Questions