

The Anchorage Canal Drainage Area Retrofit Assessment



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NPS Annual Meeting, St. Jones Reserve
March 18, 2009

Anchorage Canal Approximate Surface Drainage Area & Communities



Highway 1

Storm drain system outlet

Anchorage Canal

Stormwater Drain System



Highway One Median

Stormwater Drain System



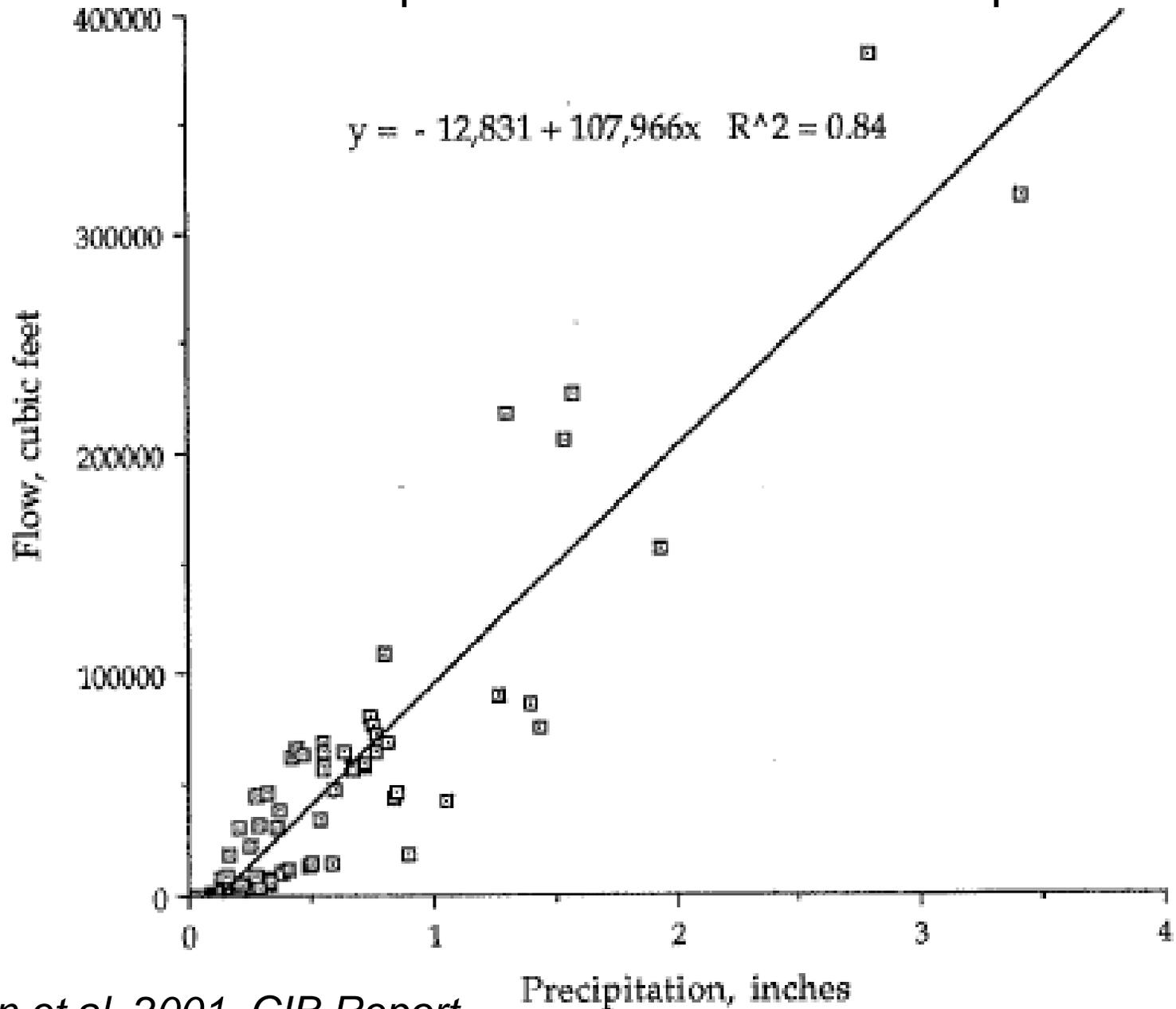
Businesses

Stormwater Drain System

Community Drains



Precipitation Runoff Relationship



Martin et al. 2001. CIB Report





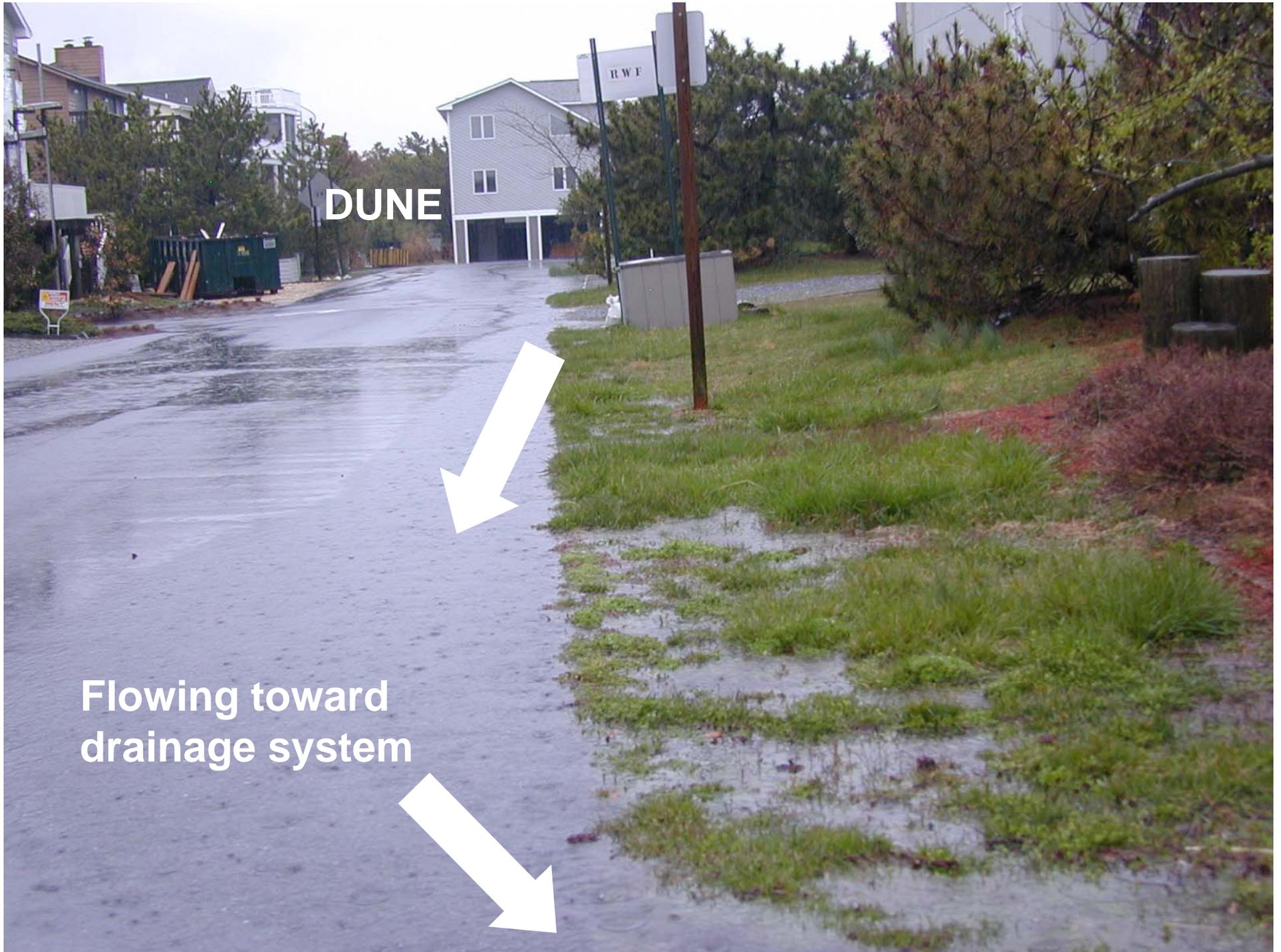
DEMARIE
Real Estate
SALES
302-539-9200

PACKAGED ICE
ICE

ICE

ICE

ICE



DUNE

**Flowing toward
drainage system**







Stormwater Pollution Loads

Nitrogen
592 lbs/yr

Phosphorus
33 lbs/yr

First flush Total
Coliforms
90,000 –
800,000 units
per 100 ml

Martin et al. 2001. CIB Report

Sediment Control Forebay



- Installed in 2004
- 16.5 yd³ of sediment enter annually
- Initially 28% efficient at sediment capture

Scarborough & Mensinger 2005 DNREC Coastal Programs Evaluation

Forebay Effectiveness

Forebay weir



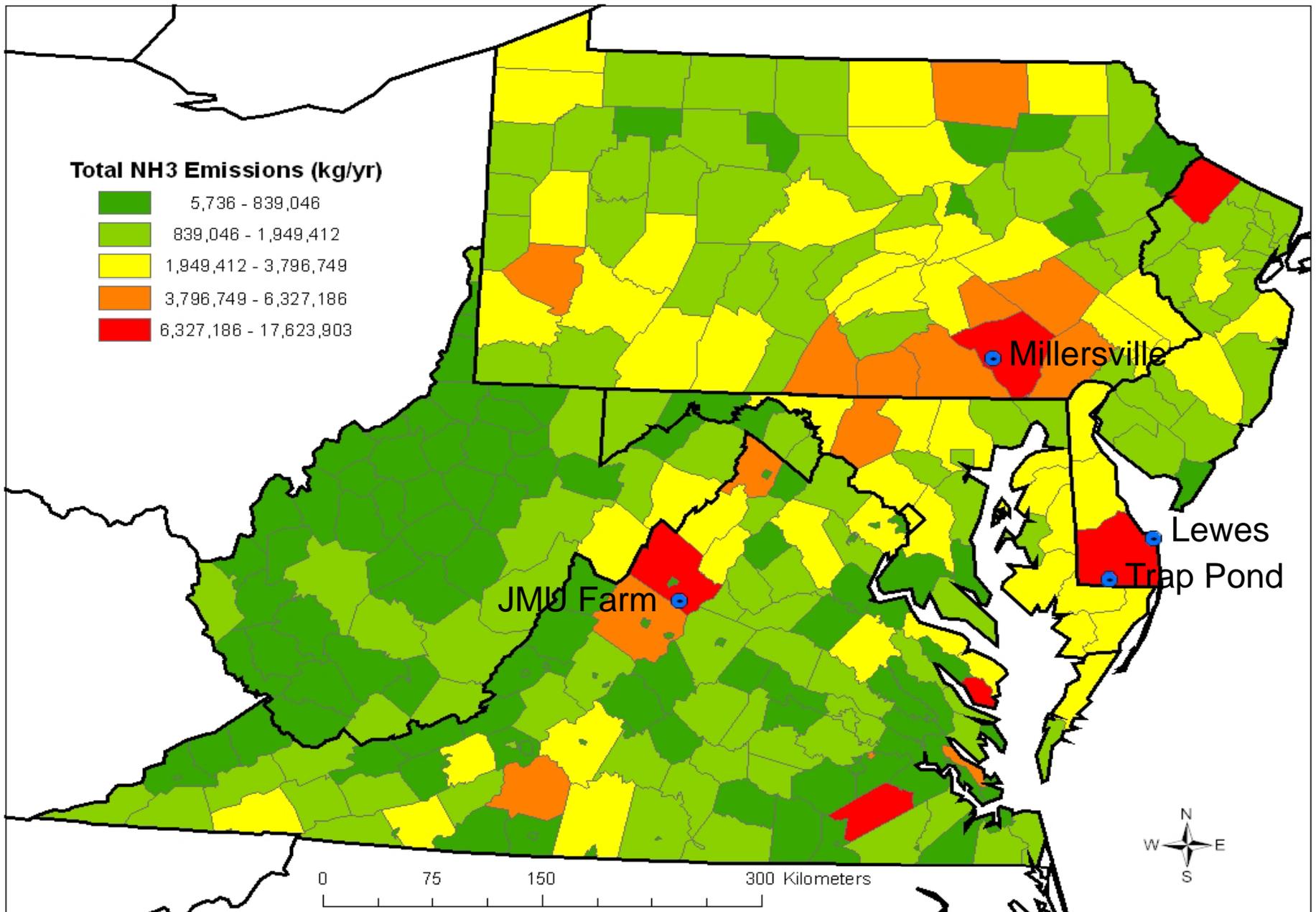
Loop Section of Anchorage at Low Tide



Additional Sources of Pollution

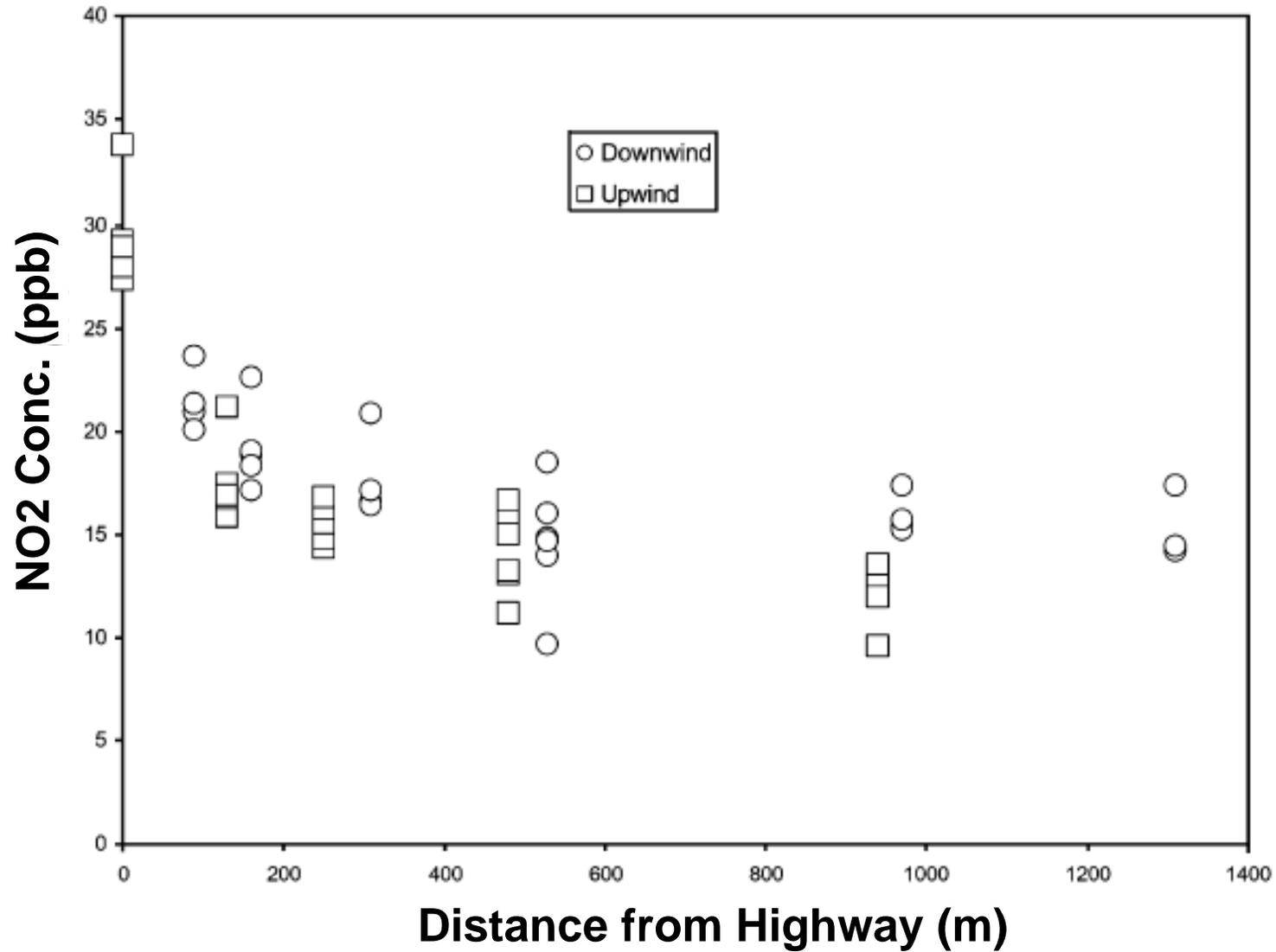
*Many homes
have roof
runoff piped
directly to
canals*



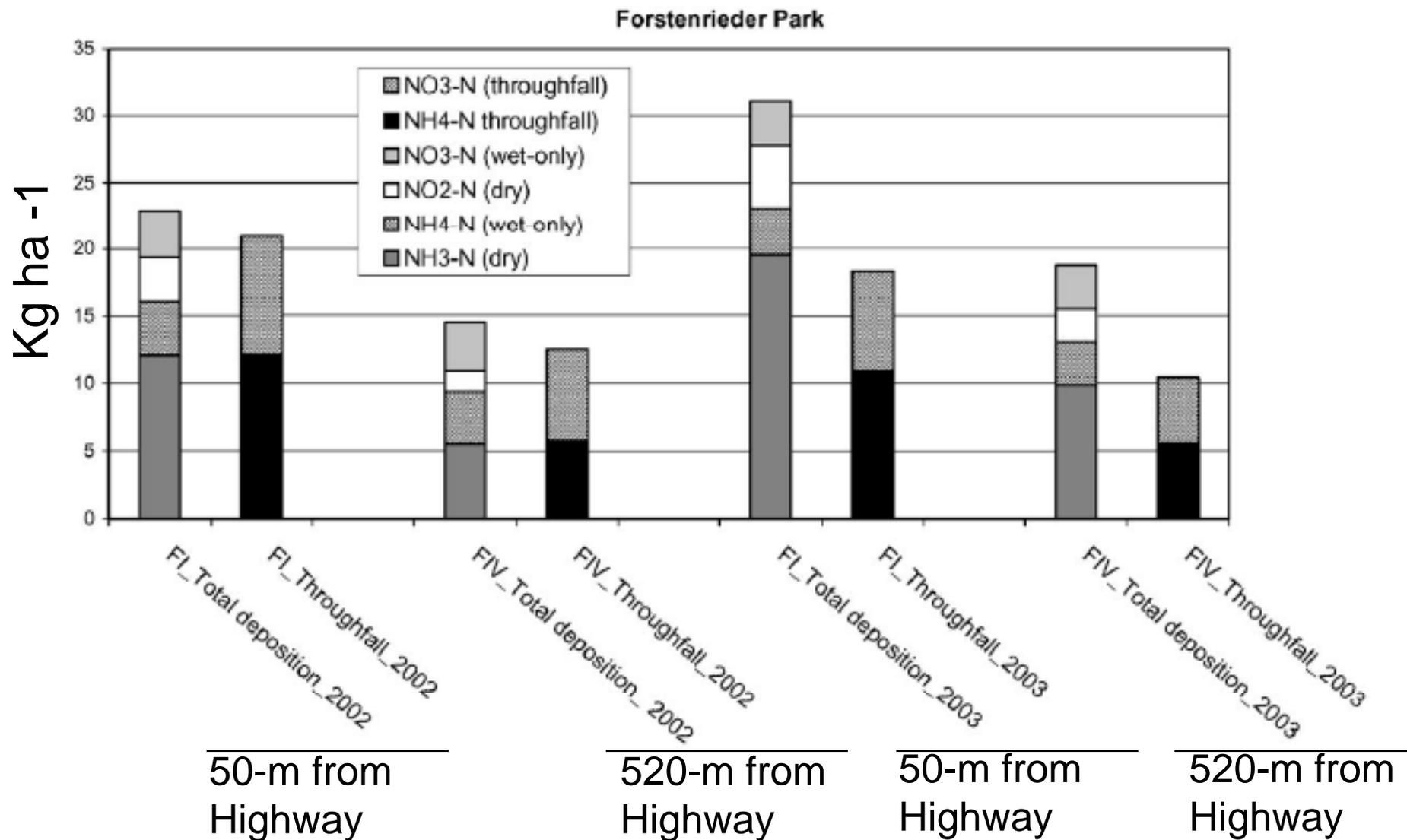


Scudlark Frontiers Conference Presentation (www.inlandbays.org)

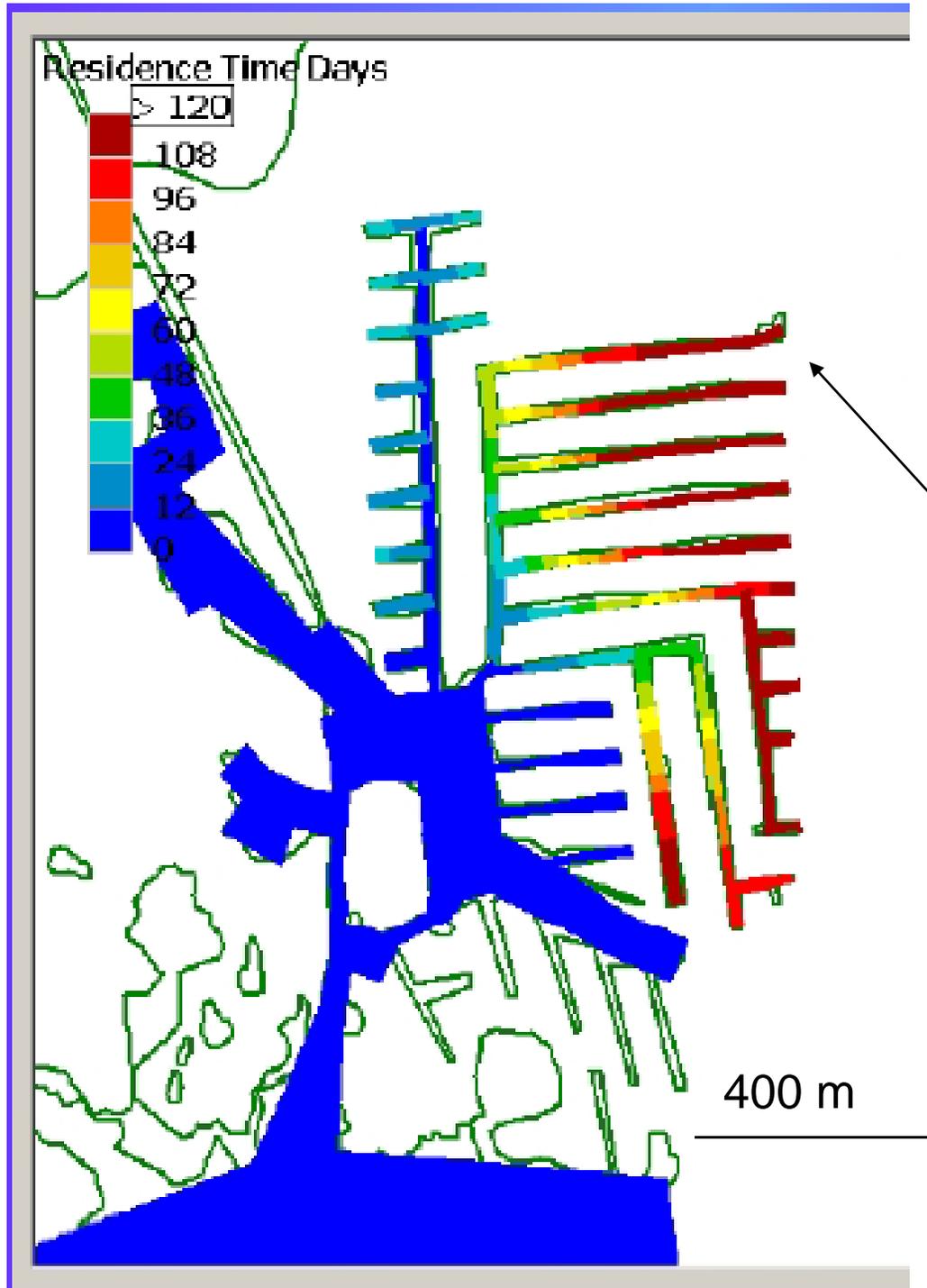
Ambient NO₂ and distance from Highway, Montreal



Effect of roadway on atmospheric deposition of nitrogen, Bavaria



South Bethany Canals Flushing Study – *Entrix* 2005



Anchorage Canal



USACE Planning Assistance to States

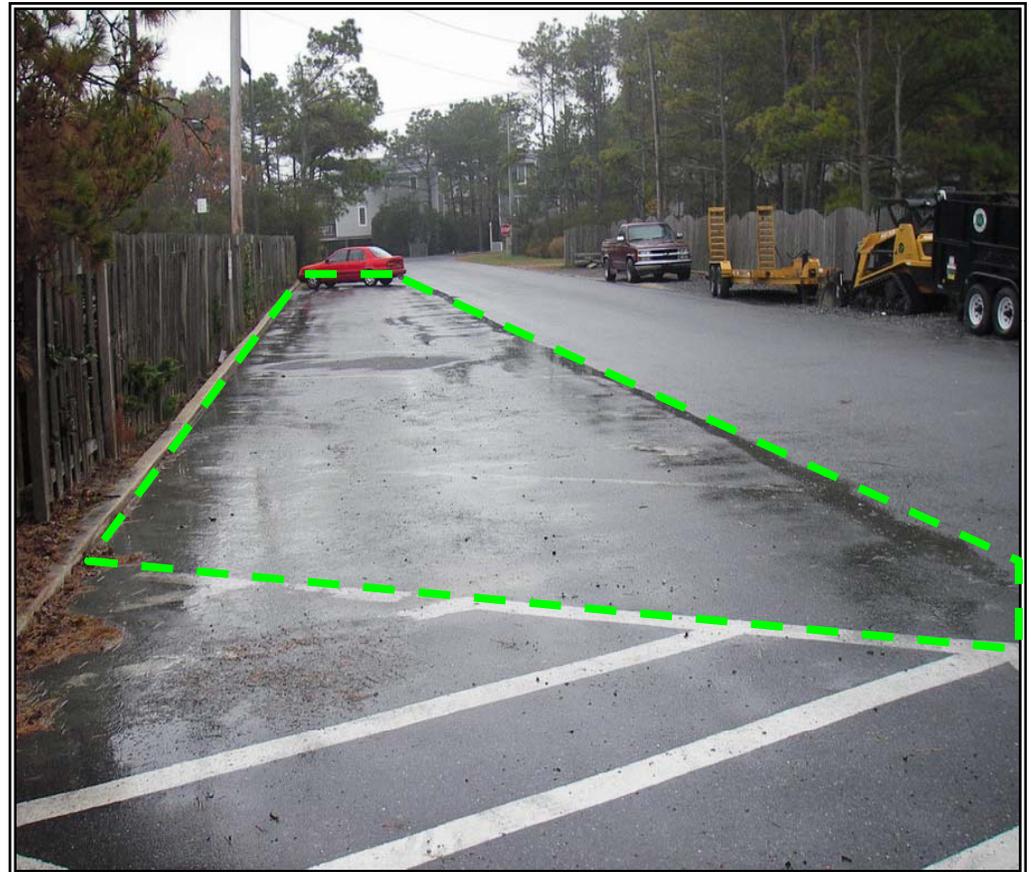
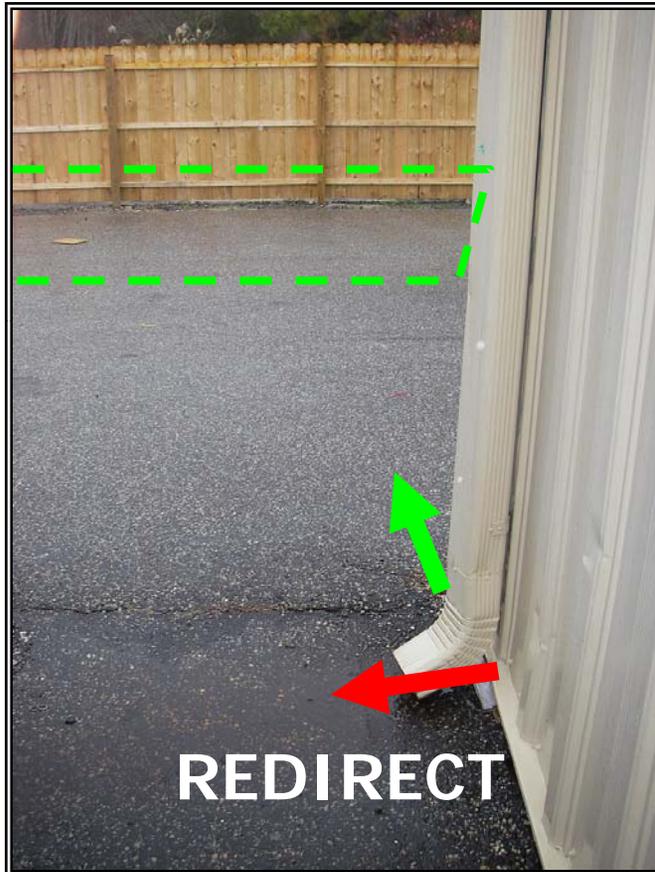
- Corps assists the States & local governments in the preparation of plans for development and conservation of water resources
- Typical studies cost \$25 – \$75K (50-50 cost share)
- ...water supply, water quality, resource conservation, wetlands evaluation, dam safety, flood plain management, harbor studies...

Assessment Approach

- To be implemented jointly by the Center for Watershed Protection & JMT
- Office Assessment
- Field Team Assessment
 - Storm Drain Inventory & Inspection
 - Retrofit Renaissance Investigation
 - the Hotspot Investigation
 - the Neighborhood Source Assessment
- Cooperators Strategy Meetings
- Final Strategy Product



Pavement Opportunities

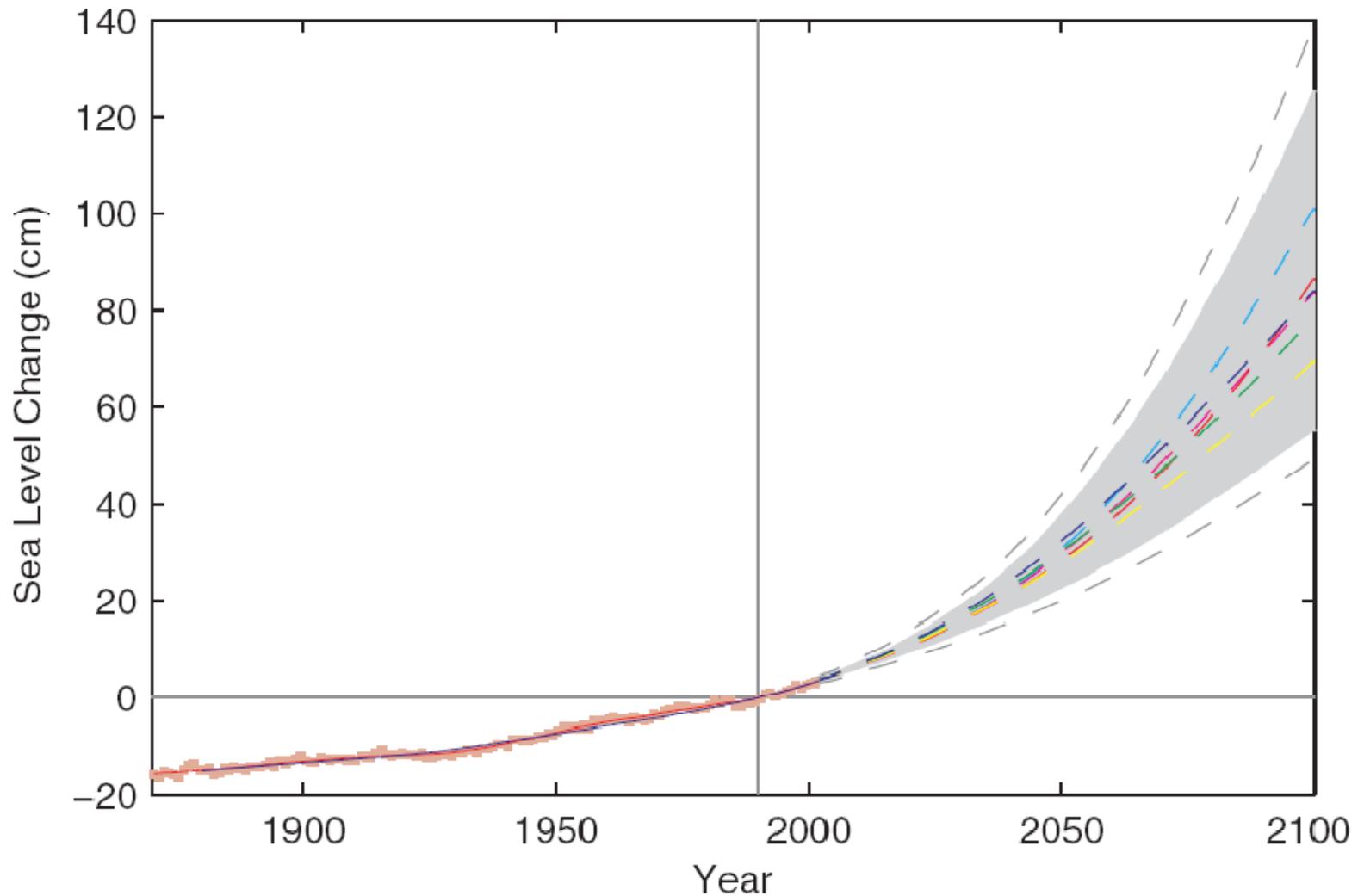


Bioretention



Project Values & Consideration

- Sea Level Rise
- Coastal Landscape Aesthetics
- Education & Outreach



- IPCC (2007) Estimates Global Sea-Level Rise 19 - 58 cm by 2100 (*now widely viewed as too conservative for planning*)
- Using a semi-empirical approach, Rahmstorf (2007 -*Science* 315: 368-370) SLR could be in the range of 45 – 140 cm by 2100





Rhus copallinum

Photo by Michael Drummond



Source: Enhancing Delaware's Highways



Progress to Date

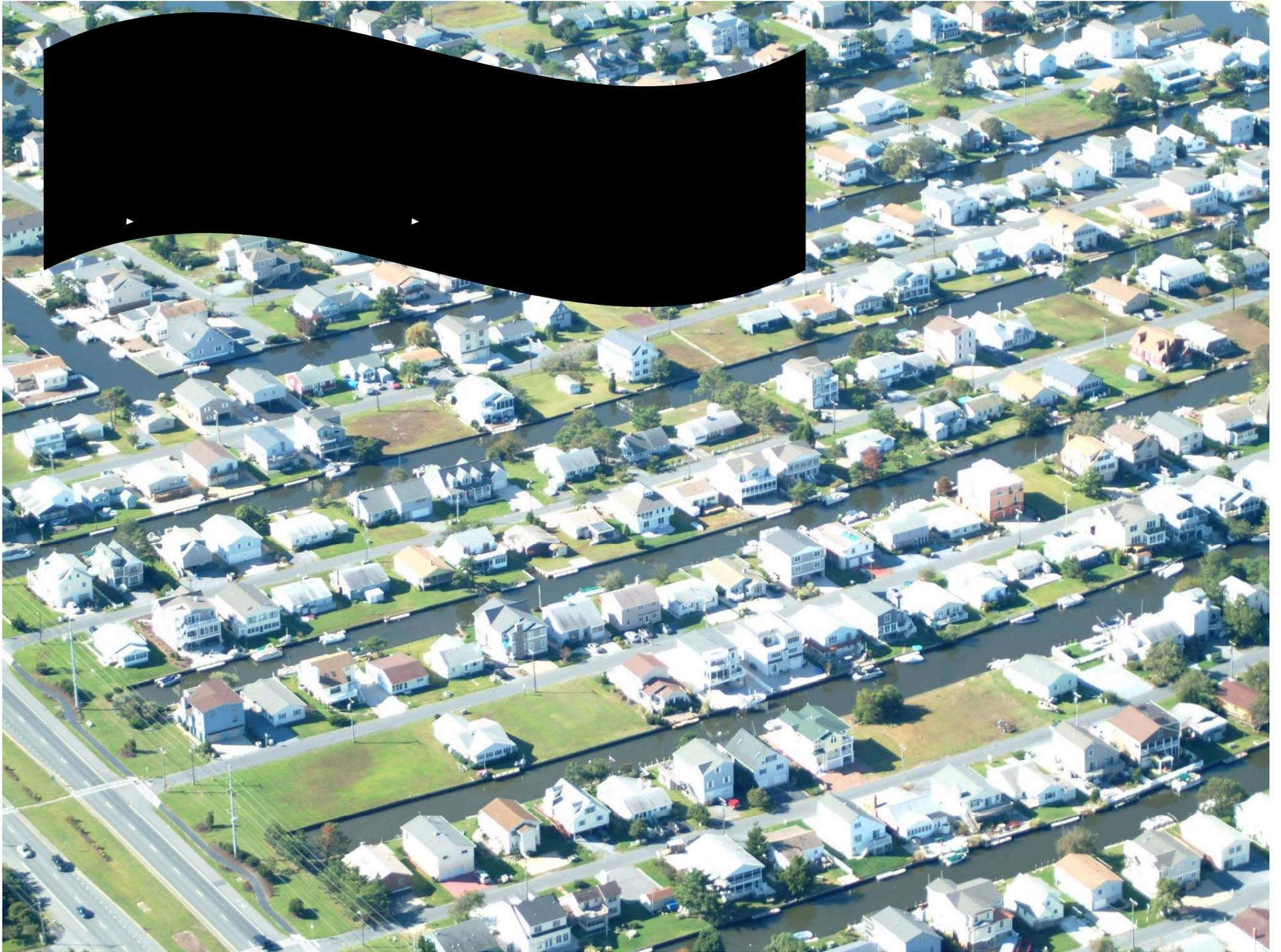
- South Bethany Water Quality Committee
- Canal Water Quality Monitoring Team
- DeIDOT funded continuous DO meter
- CIB/UD Oyster Gardening Program
- Rainbarrel Giveaway
- Education
- South Bethany Draft Impervious Surfaces and Canal Discharge for New Construction Ordinances
- Forebay
- This Project

South Bethany Canals Water Quality Monitoring



- Monitored for WQ and meteorology since 2008
- Plan developed with support of UDCMP
- Continuous Dissolved Oxygen Meter will be installed in Anchorage Canal this Spring.









Acknowledgements

- Town of South Bethany
 - Jay Headman
 - George Junkin
 - Mayor Gary Jane
- DeIDOT
 - Marianne Walch
- UDEL
 - Ed Whereat
 - Susan Barton
- USACE
 - Brian Mulvenna
- DNREC NPS Program

