

	Surfactant	Acute toxicity to rainbow trout (mg/l LC 50) (96 hrs)	Acute toxicity to Daphia spp. (mg/l LC 50 (48 hrs)
Current	Agri-Dex	>1000	377
	Class Act Nx Generation	447	60
	LI-700	130	170
	Competitor	95	>100
	Dyne-Amic	23	60
	Kinetic	14	61
	R-11	4	19
Proposed to add	Sinker	750	>1000
	Bond	190	614
	Tactic	>100	310
	Magnify	>100	8
	Exciter	>100	8
	Intensify	>100	8
	Cygnets Plus	45	7
	Liberate	18	9
Proposed to remove*	R-11	4	19

* DOE decides on the NPDES and WSDA decide on aquatic label

Toxicity of Rodeo[®] and ARSENAL[®] Tank Mixes to Juvenile Rainbow Trout

Bridget Smith, Kerensa King, Catherine Curran, Kristin Bush, David Boehm, Katey Grange, Sarah McAvinchey, David Sowle, Kevin Brown, Jennifer Cabarrus, Kimberly Genther, Jacob Gown, Rus Higley, Jenifer McIntyre, Erin Moreland, America Schaaf, Colin Sykes, Bic Wong, Jennifer Wong, Martin Grassley, and **Chris Grue**

School of Aquatic and Fishery Sciences

Washington Cooperative Fish and Wildlife Research Unit

University of Washington

TEST STATISTICS: LETHALITY

	LC50 (ppm) Formulated Product	LC50 Expressed as AI
Rodeo	782 (719-845)	421 (387-455)
ARSENAL AH	77,716 (72,189-83,243)	22,305 (20,718-23,891)

TEST STATISTICS: LETHALITY

Surfactant	LC50 (ppm)	95% CI
R-11	6.0	5.7-6.2
LI 700	17	14-21
HASTEN	74	71-76
AGRI-DEX	271	237-304

TEST STATISTICS: RODEO TANK MIXES

LC50 (ppm)

Rodeo

782

(719-845)

Rodeo + R-11

5.4

(5.0-5.9)

Rodeo + LI 700

22.6

(20.3-24.8)

TEST STATISTICS: ARSENAL AH TANK MIXES

LC50 (ppm)

ARSENAL

77,716

(72,189-83,293)

ARSENAL +
HASTEN

113

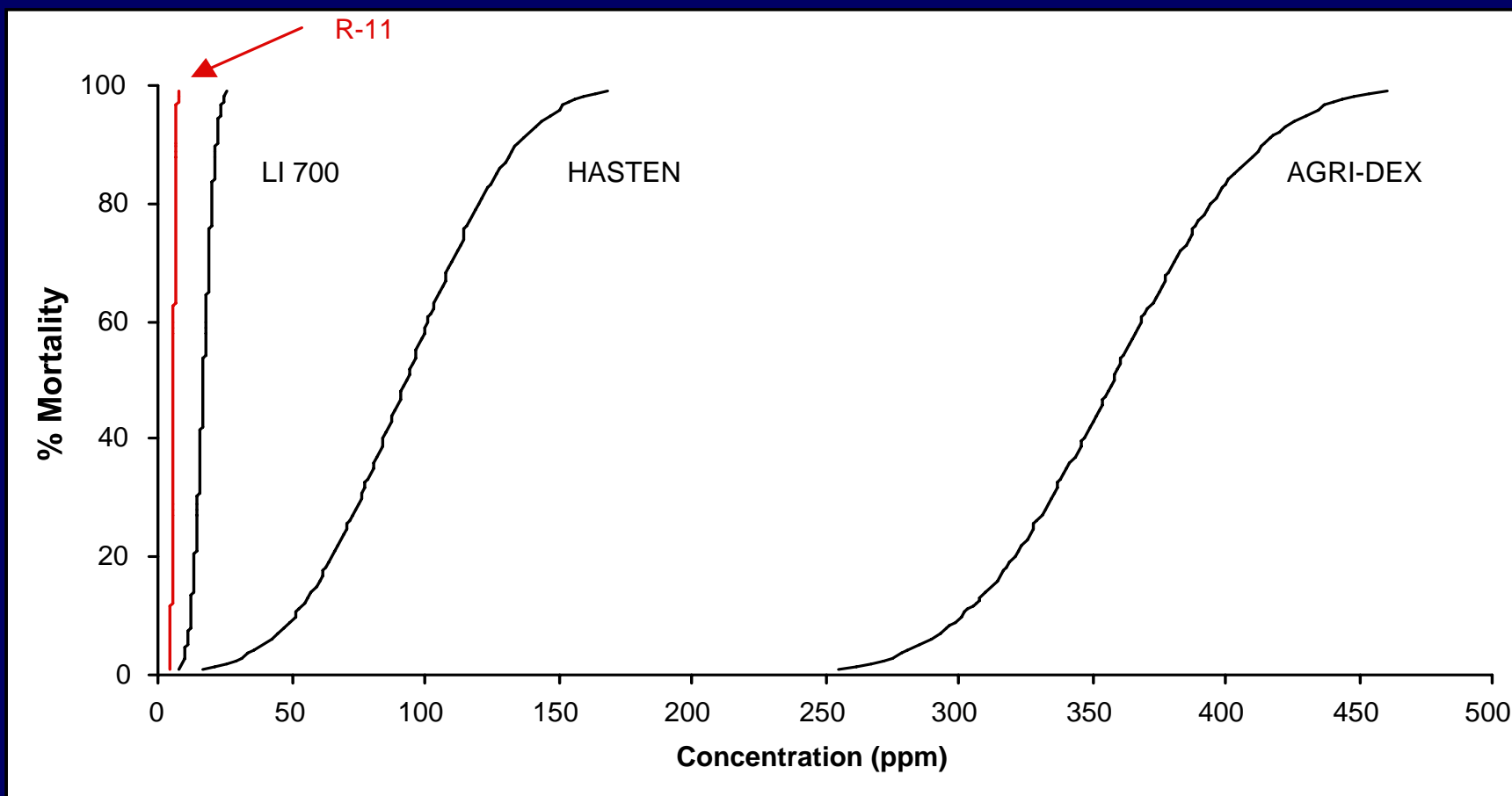
(97.0-127.9)

ARSENAL +
AGRI-DEX

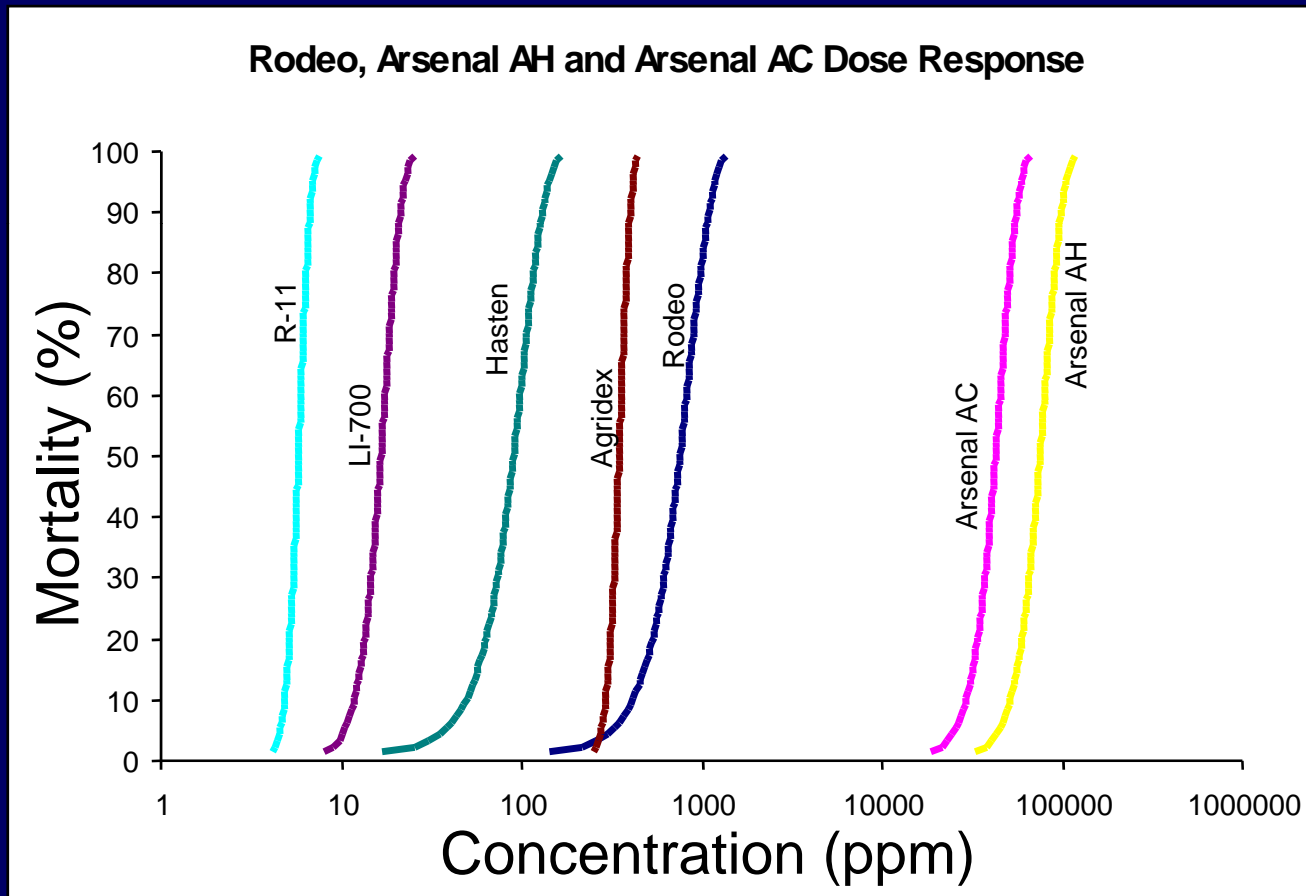
479

(454.1-503.2)

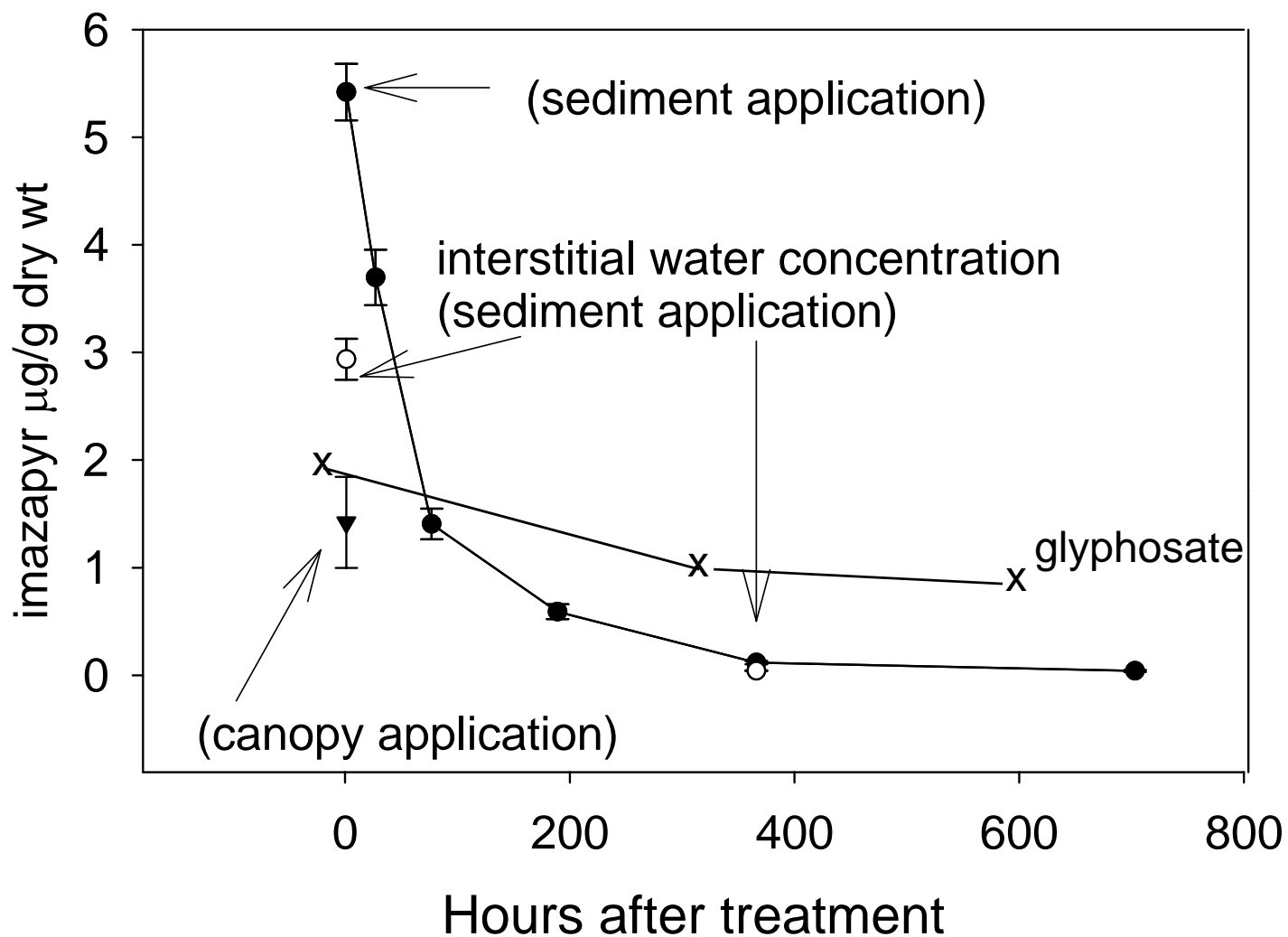
DOSE RESPONSE CURVES



DOSE RESPONSE CURVES



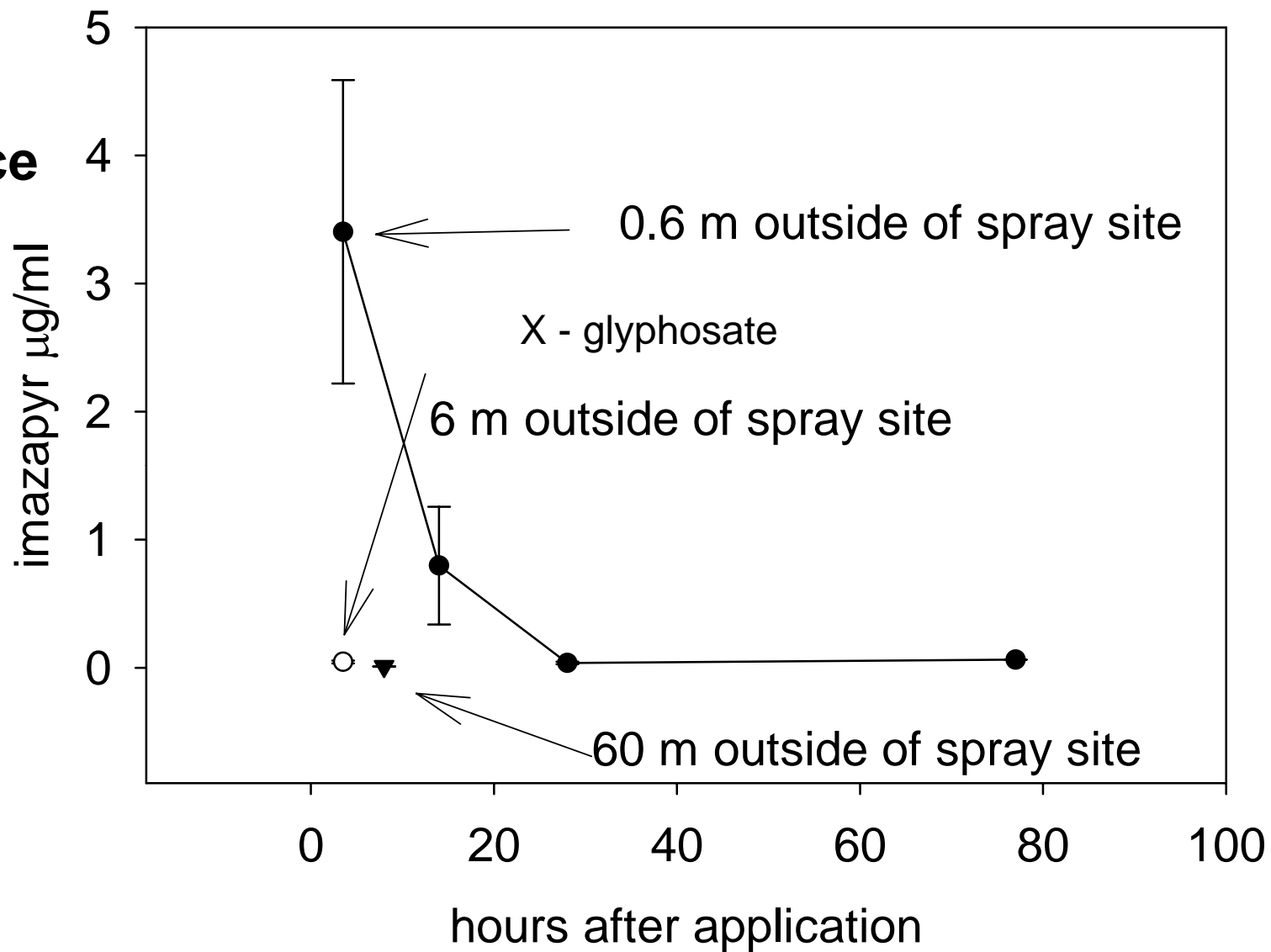
Herbicide persistence in the mudflat sediment



Imazapyr persistence in estuarine sediment

X = glyphosate persistence (Paveglio et al. 96)

Herbicide persistence in the tidal water



X - glyphosate (Paveglio et al. 1996)

Estimated half-life comparison of imazapyr and glyphosate in an estuary

Imazapyr

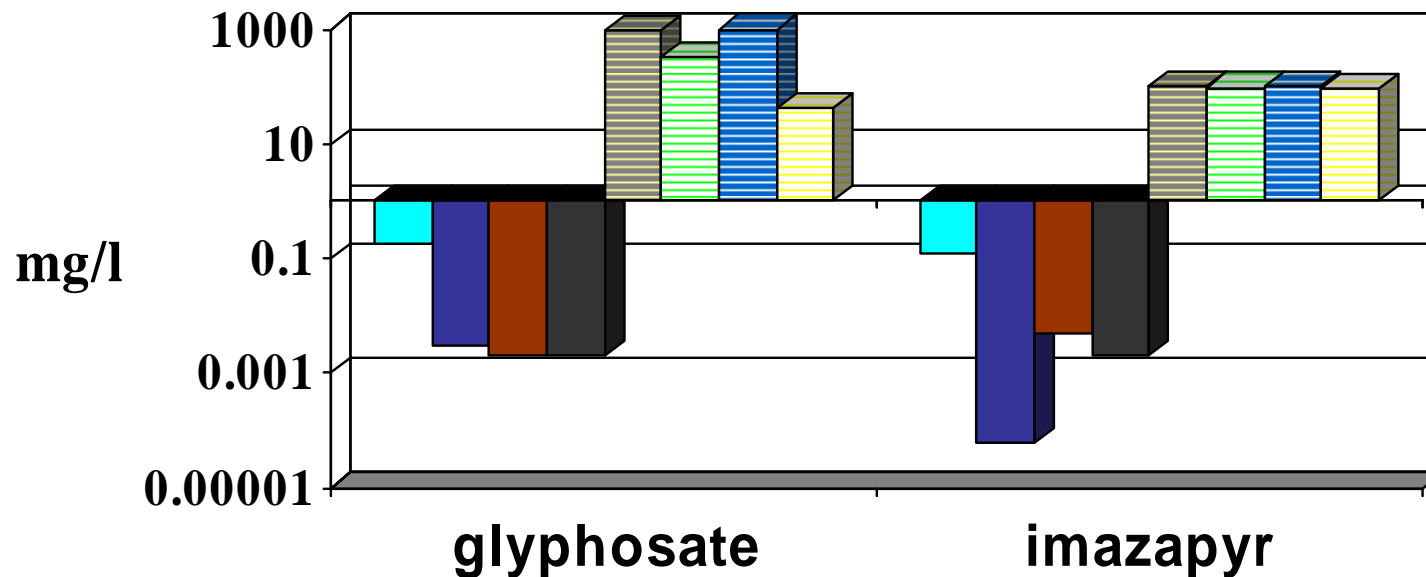
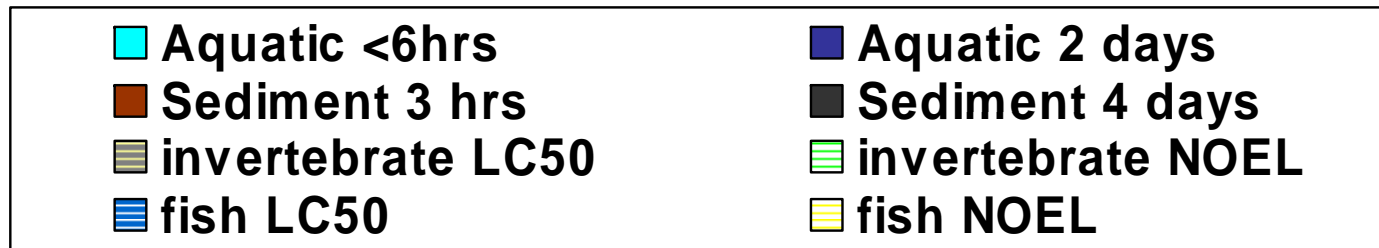
½ life in water ~ <0.5 days approaches zero asymptote - 40 hrs

½ life in sediment ~ 1.6 days approaches zero asymptote – 400 hrs

Glyphosate

½ life in sediment ~>119 days

Herbicide concentration in estuaries vs. LC50 and NOEL levels



Risk Assessment - Summary

- **Imazapyr**
 - Aquatic persistence shorter than glyphosate
 - Aquatic toxicity equal to or less than glyphosate
 - Non target impact
 - None if conditions right
 - Non-native eelgrass - *Z. japonica* density may be temporarily suppressed
- **Glyphosate**
 - Aquatic persistence not an issue
 - Aquatic toxicity not an issue
 - Non target impact not an issue

Photo Sept 2005

700 acre Spartina meadow

July 2004 -6 pt/ac Habitat 10m gpa aerial

July 2005 6pt/ac Habitat 3% Rodeo 60 gpa amphibious boom sprayer





Photo October 2005
500 acre Spartina meadow
August 2004 -6 pt/ac Habitat 10m gpa aerial
July 2005 6pt/ac Habitat 3% Rodeo 60 gpa amphibious boom sprayer