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# Update on the non-target impacts

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Northern Oyster Co., Taylor Shellfish**

# Oyster trials

- 5 dose response studies with larvae (% alive)
- 2 dose response studies with larvae (# set)
- 4 dose response studies with newly set and juvenile oyster for 6 month growth



# Oyster larvae survival to exposure to imidacloprid

## Study 1

imidacloprid (ppm)	% alive 24 hrs, 80° F
0	16 ± 7
1	10 ± 1
10	18 ± 2
100	0

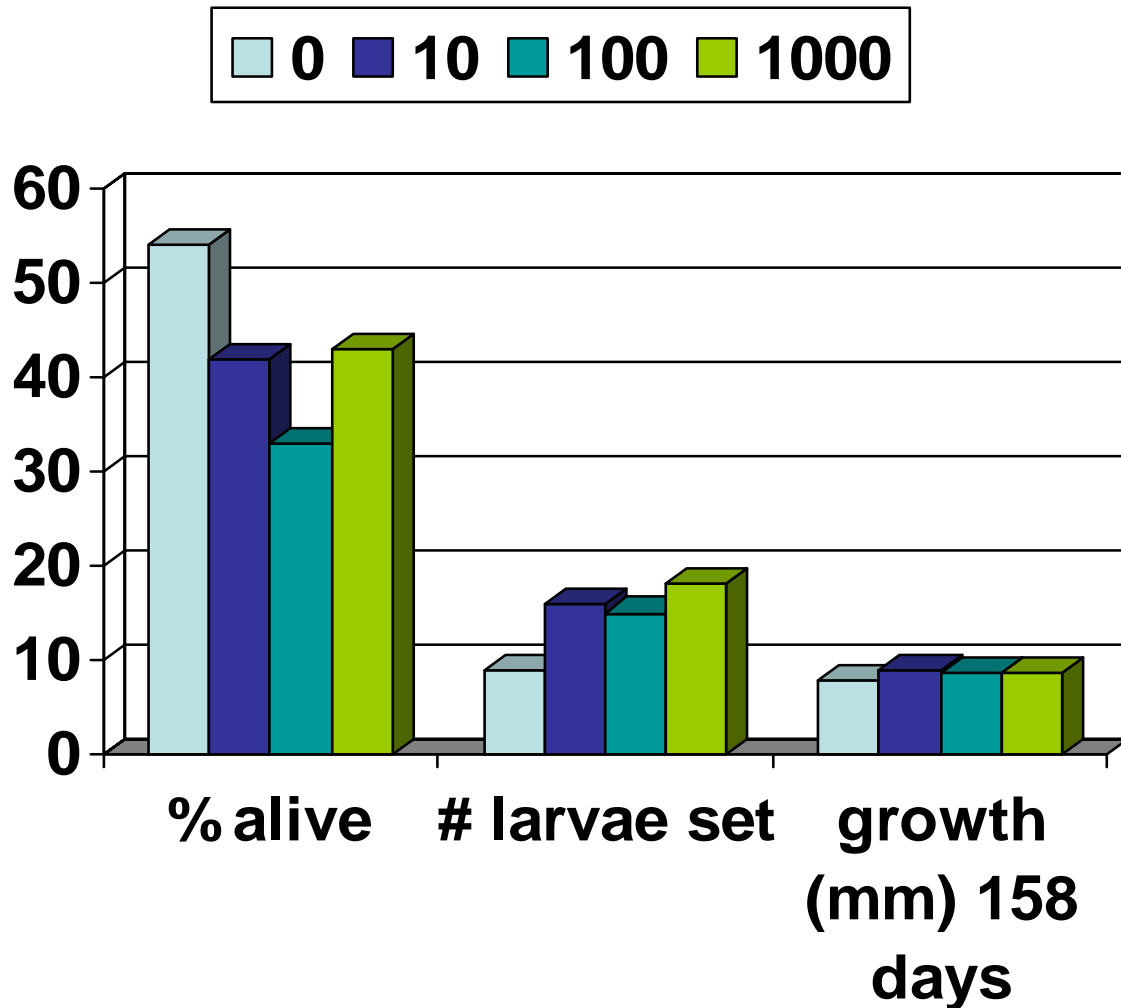
## Study 2

imidacloprid (ppm)	% alive 24 hrs, 80° F
0	67 ± 10
1	69 ± 14
5	47 ± 12
10	31 ± 9
20	42 ± 10

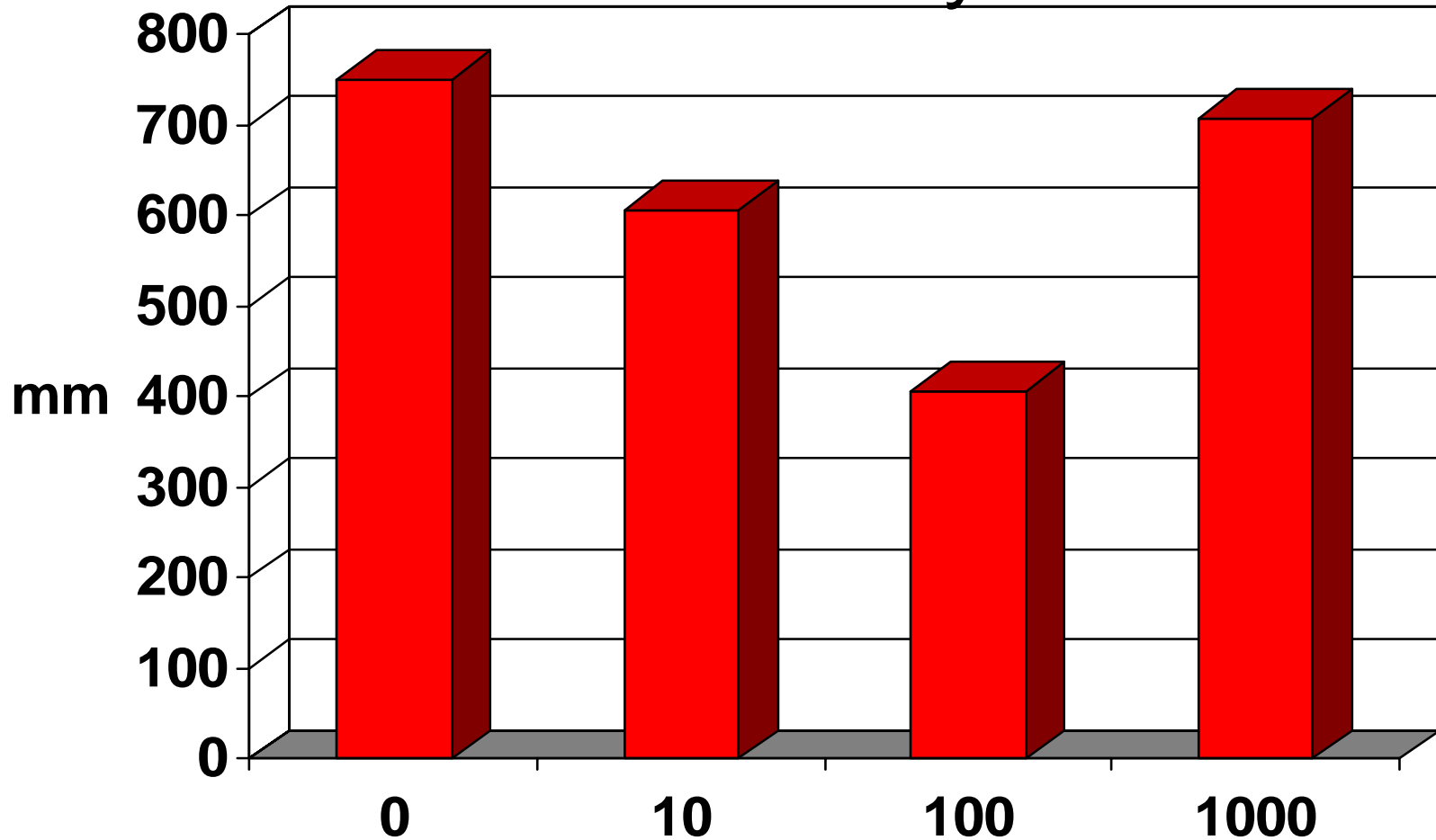
## Study 3

imidacloprid (ppm)	# % alive 24 hrs, 80° F
0	49
1	28
10	69
20	23

# Effect of 24 hrs exposure imidacloprid (ppm) on Pacific oyster larvae



# Effect of 48 hours of imidacloprid (ppm) on the growth of juvenile Pacific oyster after 273 days



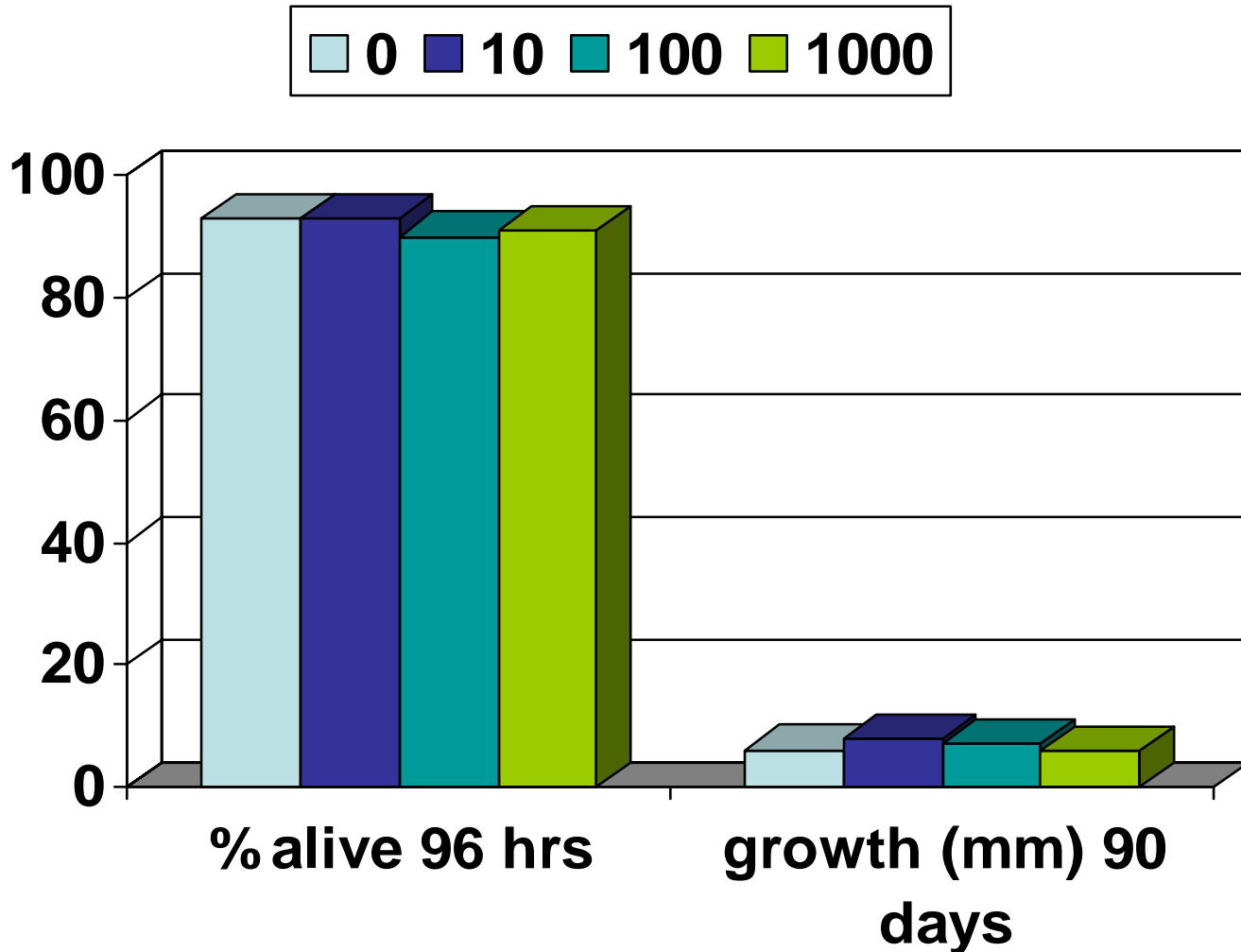


# Juvenile Clams toxicity trials

- 2-5 mm clams - % alive & 6 months growth following 48 and 96 hours exposure 0,1, 10, 100 ppm



# Effect of imidacloprid (ppm) on Manila clam survival and growth

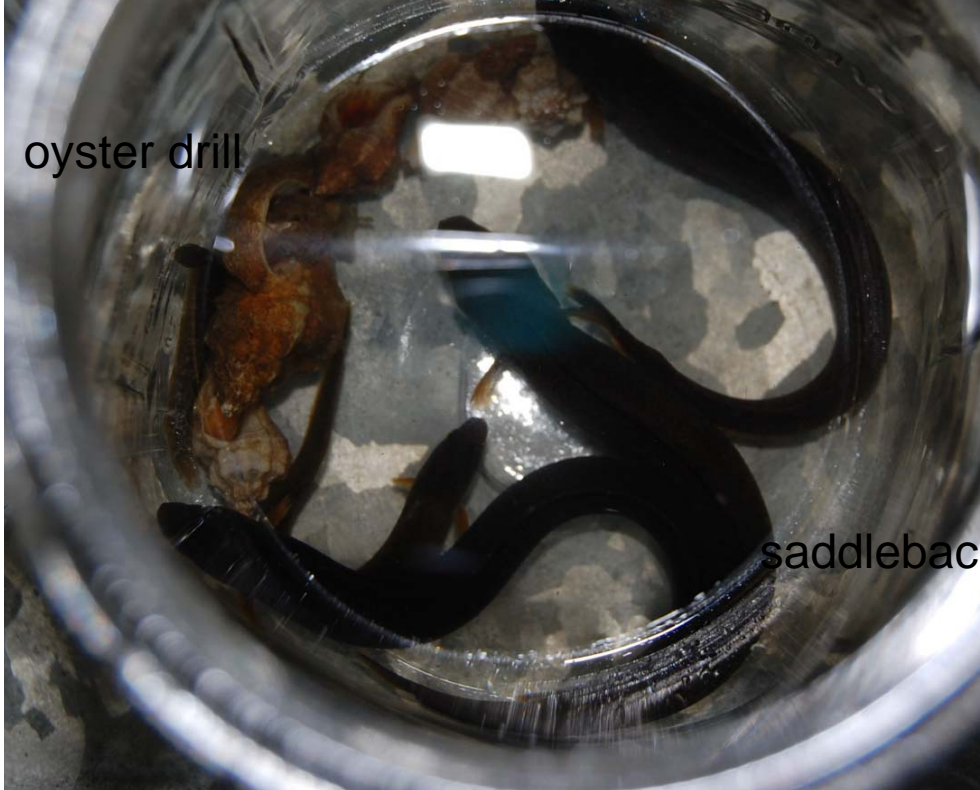




# Nontarget species survival following 4, 24, 48 & 96 hours exposure to 0, 1, 10, 100 ppm imidacloprid



Nereid polychaetes



oyster drill

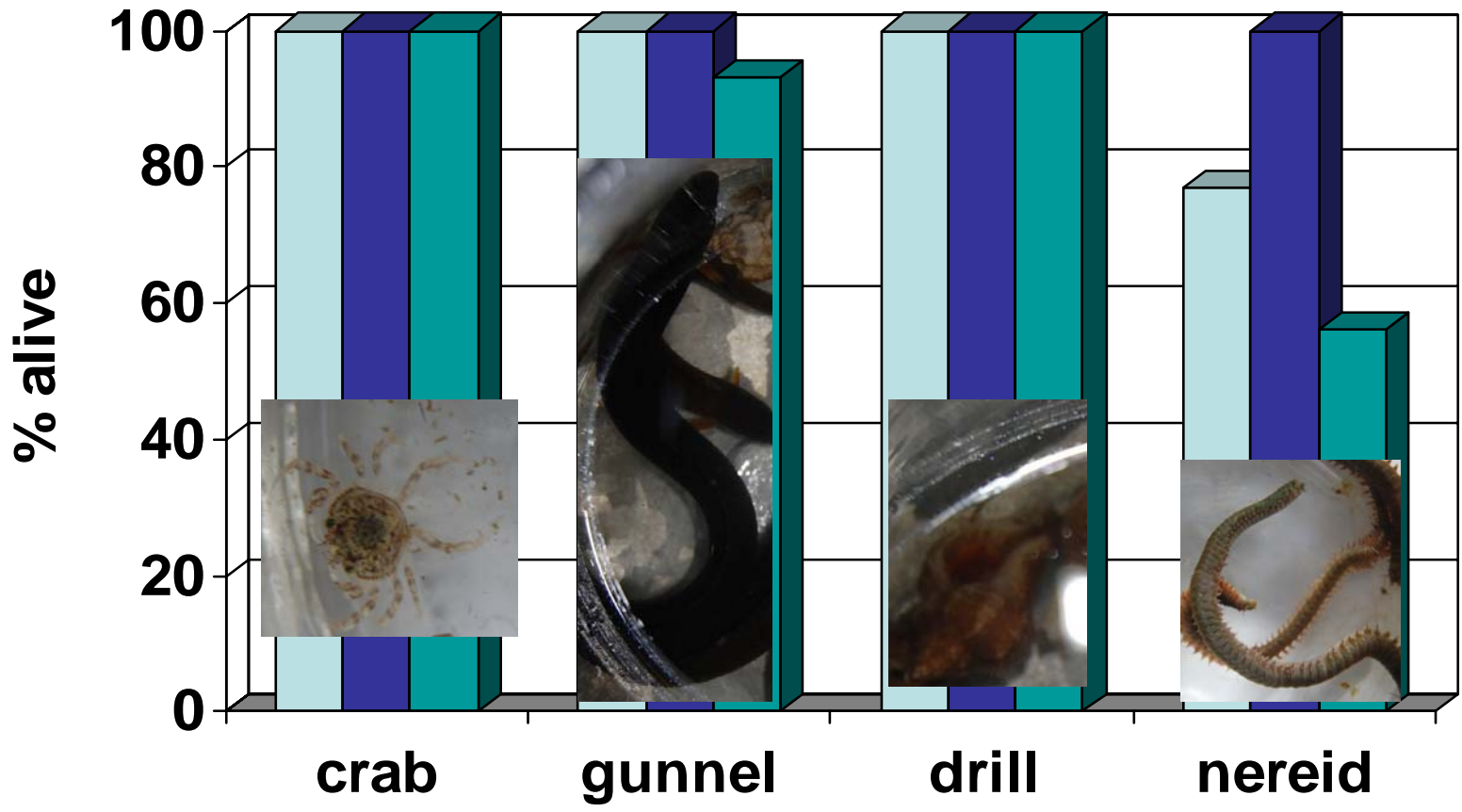
saddleback gunnels



Dungeness megalopae

# Effect of 96 hours exposure imidacloprid (ppm) on survival nontarget species

0 10 100



# Conclusion: non-target

- Expected exposure
  - Typical tidal flat exposure for first hour ~40 to 120 ppb
  - undrained tidal pool 600 ppb
  - Drops to <1 ppb within 6 hours
- Realistic to assume 1 ppm exposure for 6 hours would be the worst an organism would experience.
- No effect on oyster larvae @ 20 ppm – 24 hours
- No effect on juvenile oysters @ 1000 ppm – 48 to 96 hours exposure
- No effect on young clams @ 1000 ppm – 96 hours exposure
- No effect on crab Dungeness megalopae, Nereid polychaetes, saddleback gunnels, oyster drill @ 100 ppm – 96 hours exposure
- Appear to be 20 to 1000-fold safety factor for typical non-target species.

# Next steps:

- Additional non-target data for early life stages of crab.
- Better data sets on oyster larvae
- Additional data for juvenile clam and oyster grow-out