

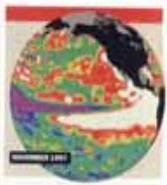
Will the European Green Crab persist in PNW Estuaries?

Sylvia Behrens Yamada and Andrea Randall Oregon State University

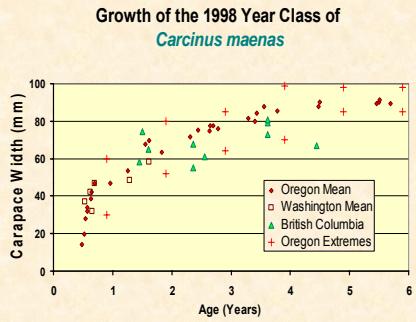


Background

Following the strong El Niño of 1997-98, a large cohort of young green crabs, *Carcinus maenas*, appeared in estuaries along the coasts of Oregon, Washington, and on the west coast of Vancouver Island.



Unusually strong northward moving coastal currents (of up to 50 km/day from September 1997 to April 1998) must carried green crab larvae from source populations in California to the Pacific Northwest.



Since coastal transport events have been much weaker in recent year, it was hoped that green crabs would go extinct in the Pacific Northwest estuaries once the original colonists reached the end of their life span of 6 years and no new larvae arrived from California.

Will Green crabs go extinct in PNW?

- no strong El Niño events since 1998
- no more larvae from California
- 1998 cohort died of old age by 2004

☞ Green Crabs should die out in PNW

But this has not happened!



Local recruitment has occurred in Pacific Northwest estuaries since 1998.



Northern range expansion of Green Crabs is linked to strong pole-ward coastal currents during the 1990's.

Recruitment and growth of young green crabs was especially good in 2003 and 2005, following warm winters.

Warm Winters → good Recruitment and Growth

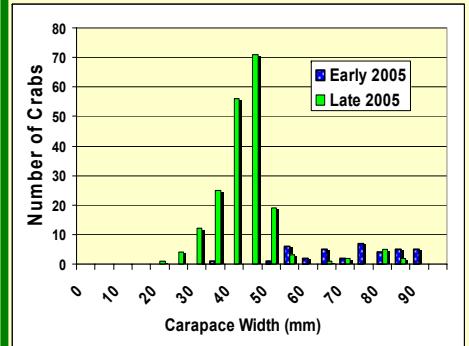
Year	Mean Winter °C	Recruitment	Mean CW (mm)
1998	10.9	++++++	46.9
1999	9.0	++	38.0
2000	9.5	++	37.5
2001	9.5	++	NOT SAMPLED
2002	9.2	+	38.9
2003	10.5	+++	44.9
2004	9.9	++	35.3
2005	10.3	++++	46.3

A satellite population of green crabs, comprised mainly of the 2003 cohort, was also discovered on the northwest coast of Vancouver Island, including Little Espinosa Inlet.

Number of Green Crabs per 100 trap-days

Estuary	1998	1999	2002	2003	2004	2005
Lt. Espinosa						5
Willapa				3	3	25
Tillamook	128		3	6	8	11
Netarts	139		0	25	31	49
Yaquina	192	69	15	6	3	13
Coos	65	38	5	7	13	4
Coquille						5

Even though the 2003-year class was an order of magnitude less abundant than the 1998 one, it produced sufficient recruits in 2005 to maintain the Oregon and Washington satellite population of green crabs.



In spring and early summer of 2005, we trapped very few adult green crabs. After mid-August, young-of-the-year green crabs entering our traps and the 2005 cohort is now the dominant year class in PNW estuaries.

Conclusions

Even though the original colonists from the 1998 cohort have died of old age, green crabs have persisted in Pacific Northwest estuaries.

A density of 7 green crabs per 100 traps produces sufficient recruits to maintain the Oregon and Washington populations.

Warm winters are linked to good green crab recruitment and growth.

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