

How Does Climate Change Affect Juvenile Chum Salmon in the Northern Bering Sea?

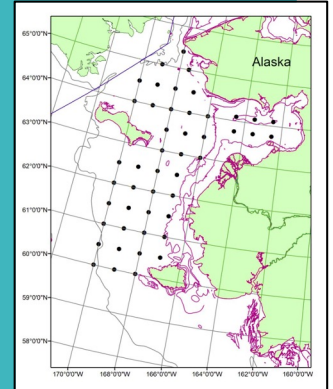
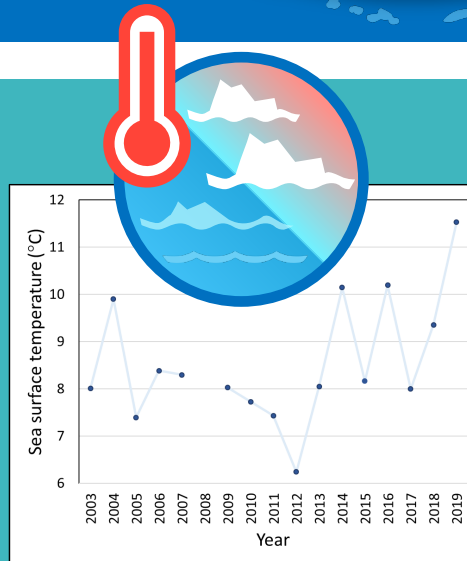
Climate change impacts **Pacific salmon populations** in Alaska as environmental conditions shift, making it important to better understand **impacts on salmon** at all life stages.



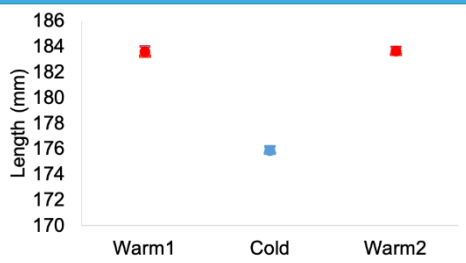
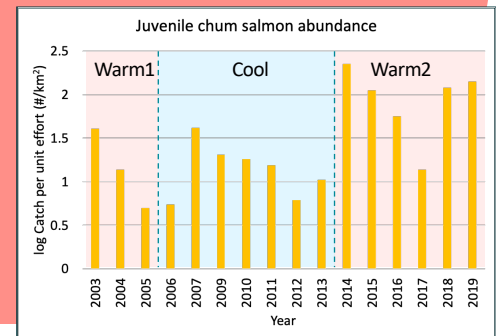
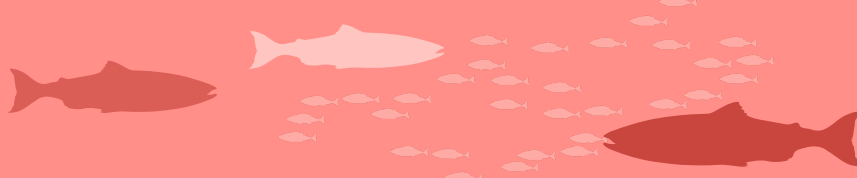
NOAA Fisheries Alaska Fisheries Science Center studied the effects of **ecosystem changes** on juvenile Chum salmon in the northeastern Bering Sea during 2002-2023.

The northern Bering Sea has been experiencing **unprecedented warming events** in recent years due to climate change.

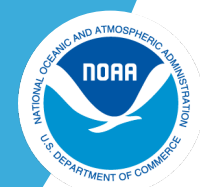
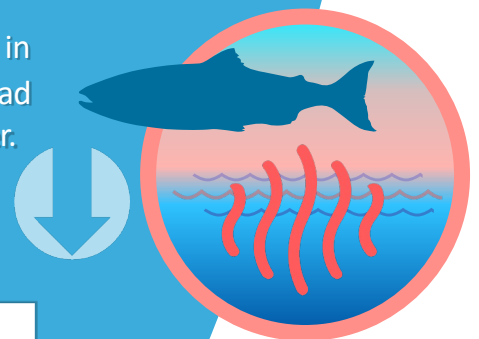
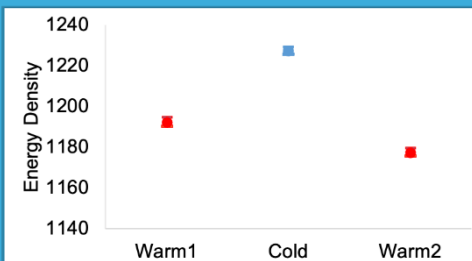
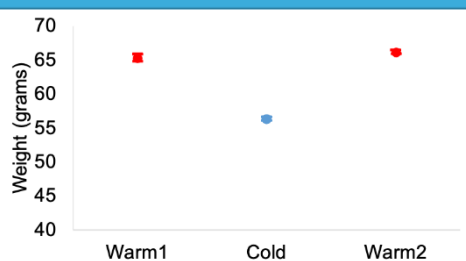
Above average sea surface temperatures were recorded in 2014-22.



There were **more juvenile salmon** during late summer in **recent warm years**.



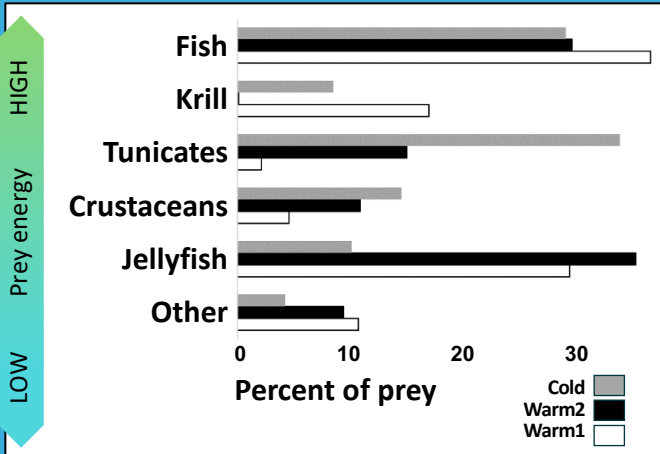
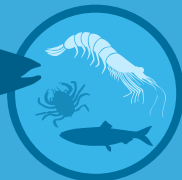
These salmon were **larger** but in **poorer condition** so they had **less energy** to survive winter.



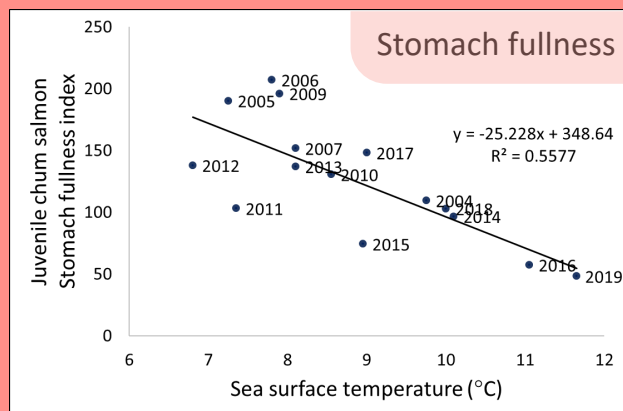
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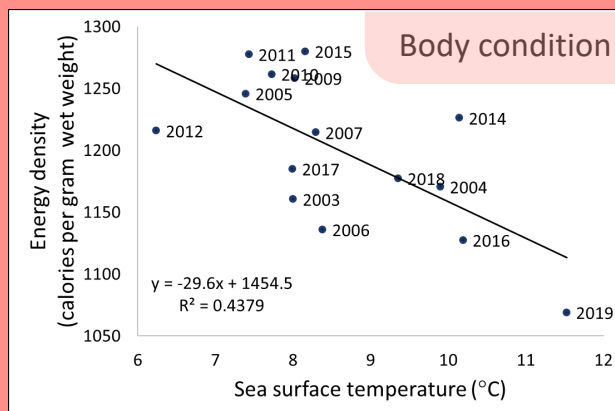
In all years, 30-40% of juvenile Chum salmon **salmon diet** was fish. During warm years, the remaining 60-70% of salmon diet was **lower quality prey**, whereas in cooler years salmon ate **higher energy prey**.



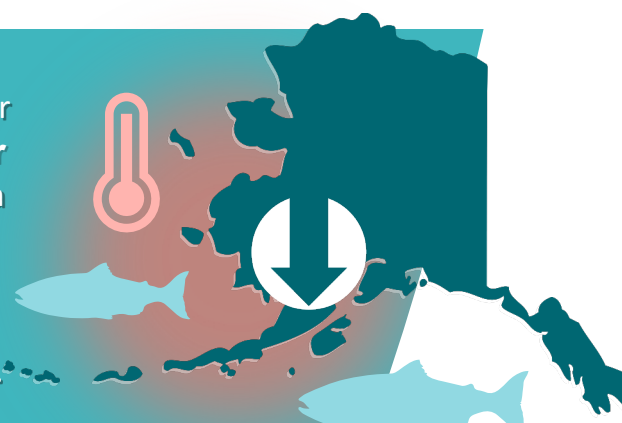
As **ocean temperatures rise**, stomach fullness declines, meaning that the juvenile Chum salmon are **eating less**, and the food that they are eating provides less energy.



When juvenile Chum salmon feed primarily on **low quality prey**, their body condition is lower, with the lowest values occurring during the very **warm recent years**.



Because western Alaska Chum salmon spend their first winter at sea in the **Gulf of Alaska**, we think that the **warmer environmental conditions** in the northern Bering Sea and Gulf of Alaska in recent years led to much **lower energy stores** in juvenile salmon, making them **more vulnerable to poor winter conditions** and increasing the probability of higher overwinter mortality.



Coastal Impacts Assistance Program



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Questions? Contact Ed.Farley@noaa.gov