

Biology of Leatherback Turtles off California: Movements, Foraging Ecology, Abundance, and Status

*Presentation to the California Dungeness Crab Fishing Gear
Working Group, 23 April 2019*



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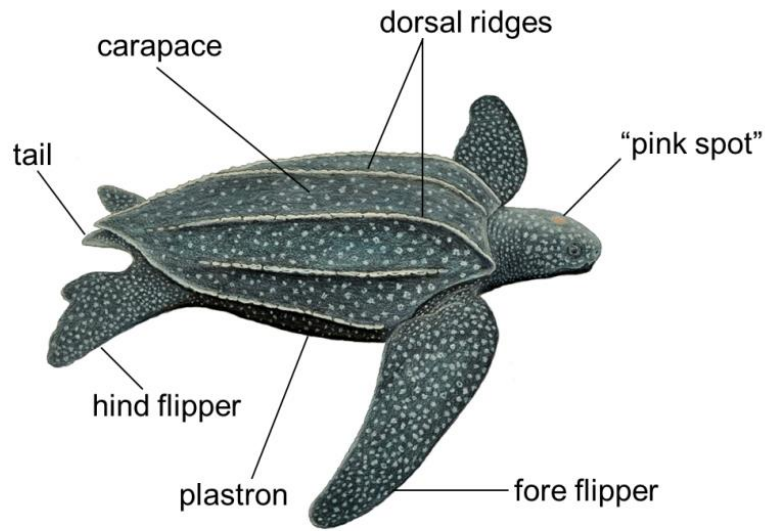
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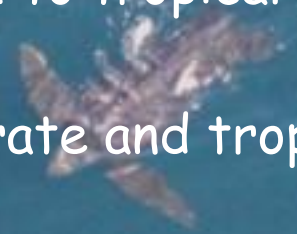
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Leatherback turtle

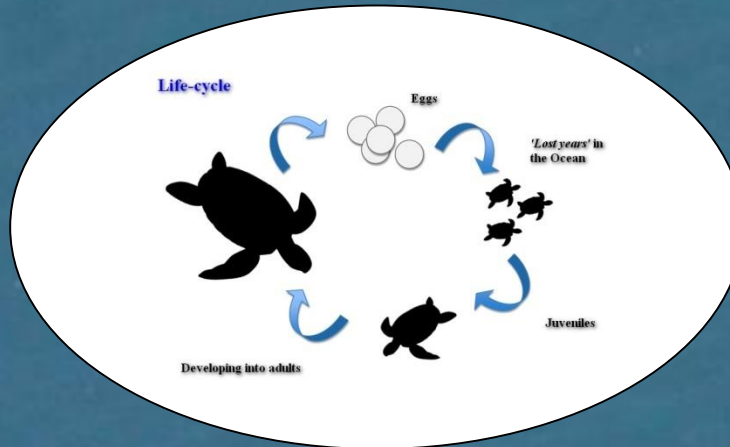


- Largest turtle in the world (up to 7ft and 2000 lbs.)
- Flexible, skin-covered carapace
- Most extensive range of any living reptile
- Cold water tolerant (mesotherm)
- Deepest diving reptile (to ~3000 ft)
- Consume gelatinous prey (jellies, salps, tunicates)
- Nesting confined to tropical beaches
- Forage in temperate and tropical regions

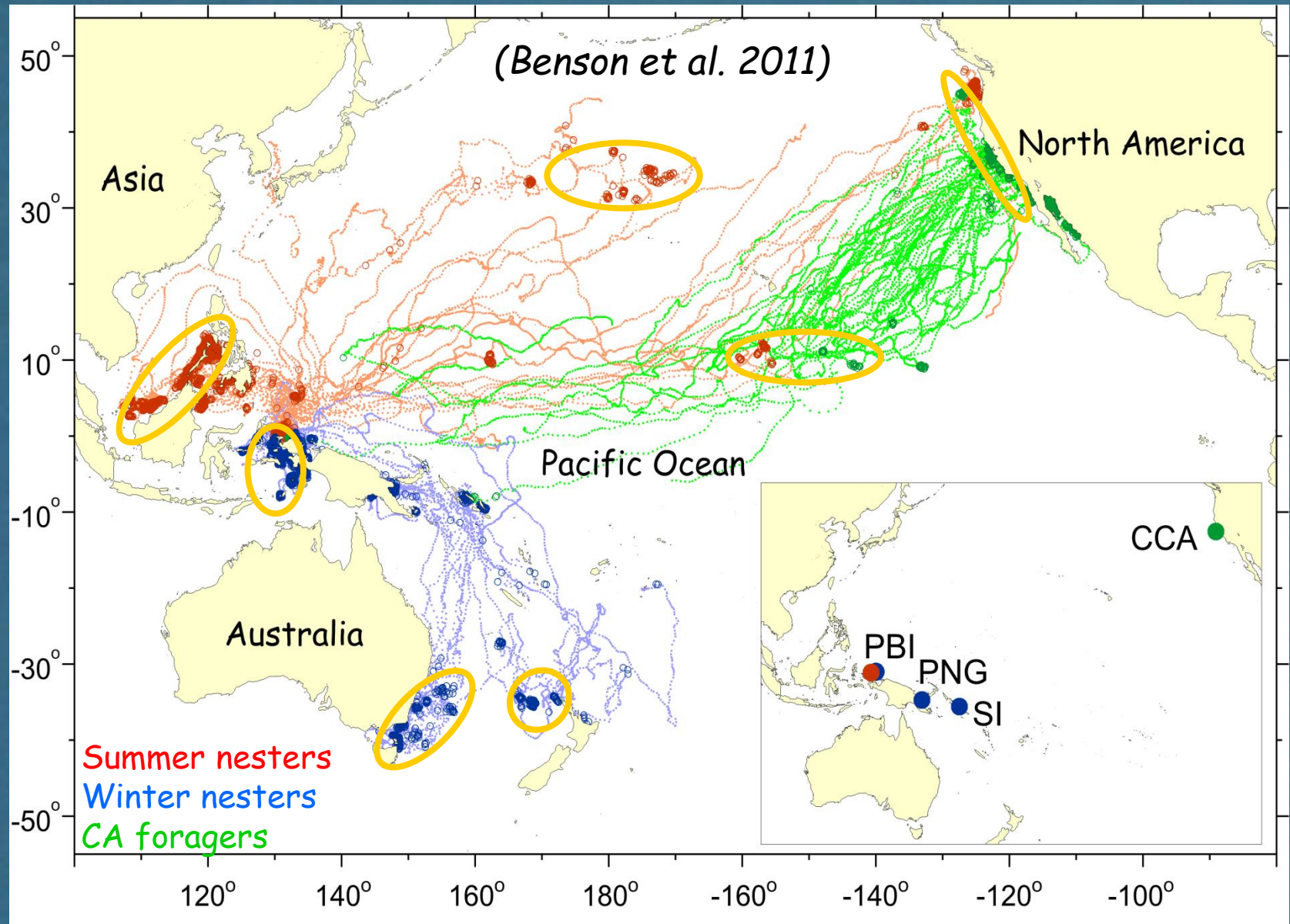


Leatherback turtle life cycle

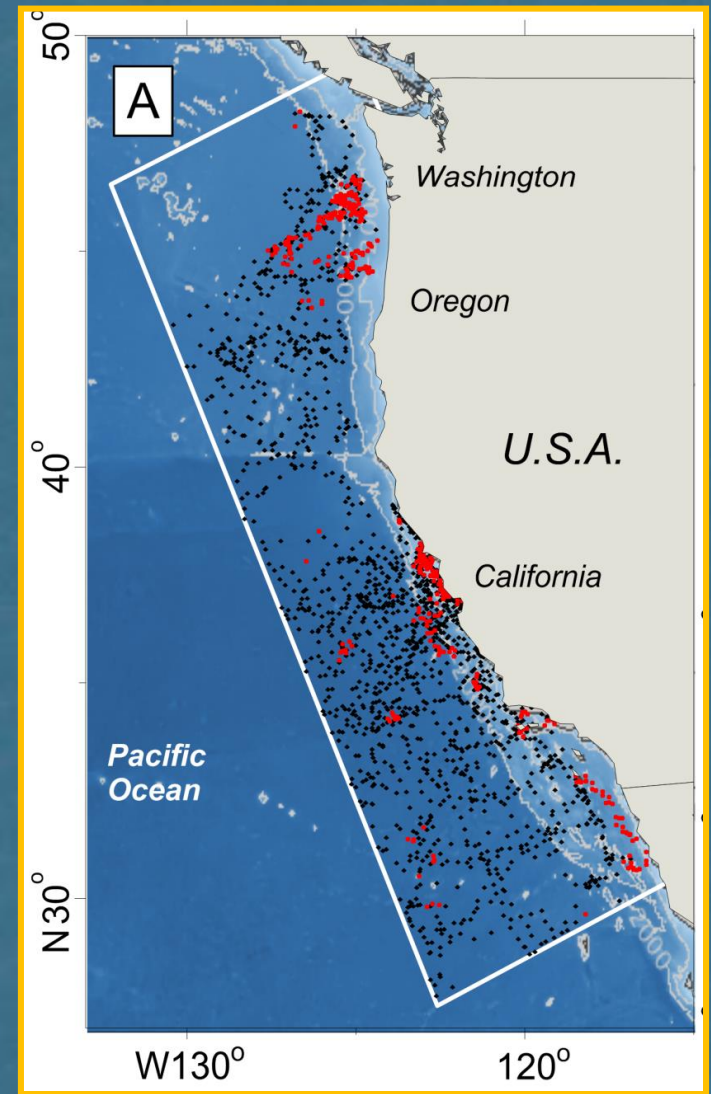
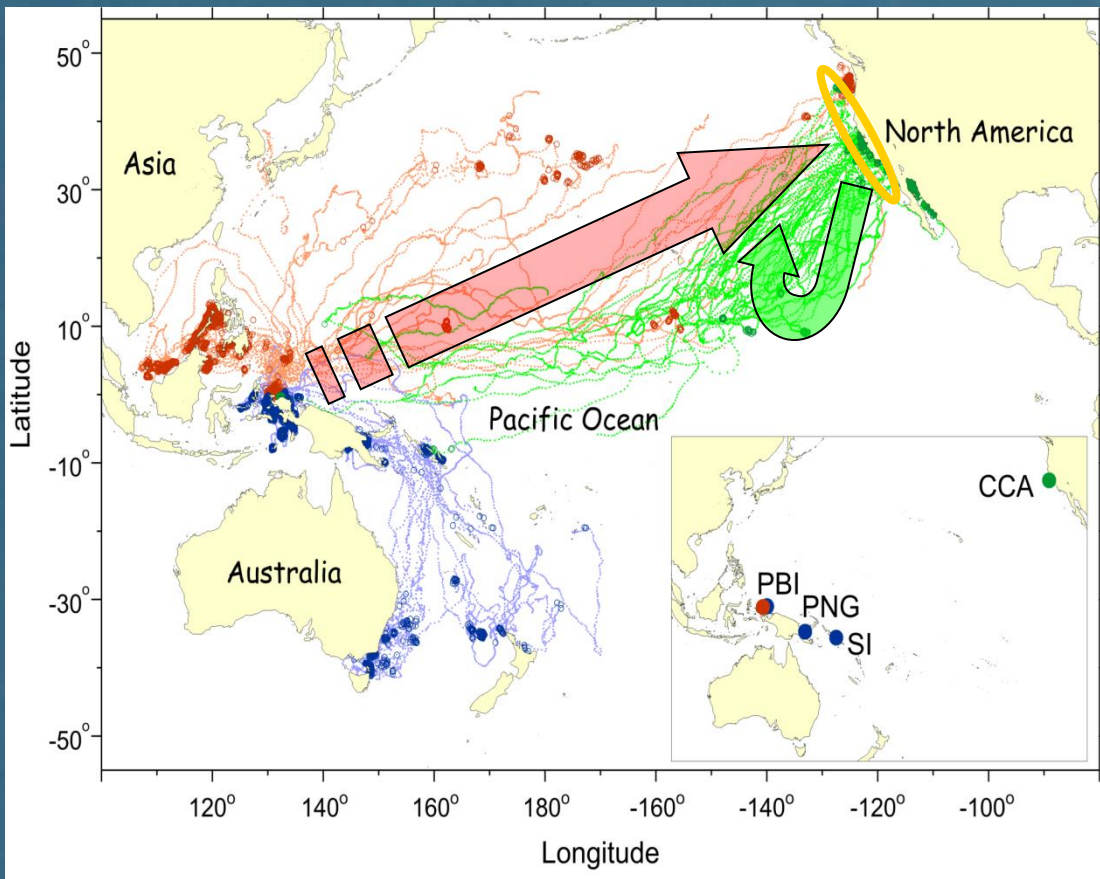
From tropical nesting beaches to temperate or tropical foraging areas throughout the Pacific (including U.S. West Coast)



Western Pacific leatherback movements & foraging areas

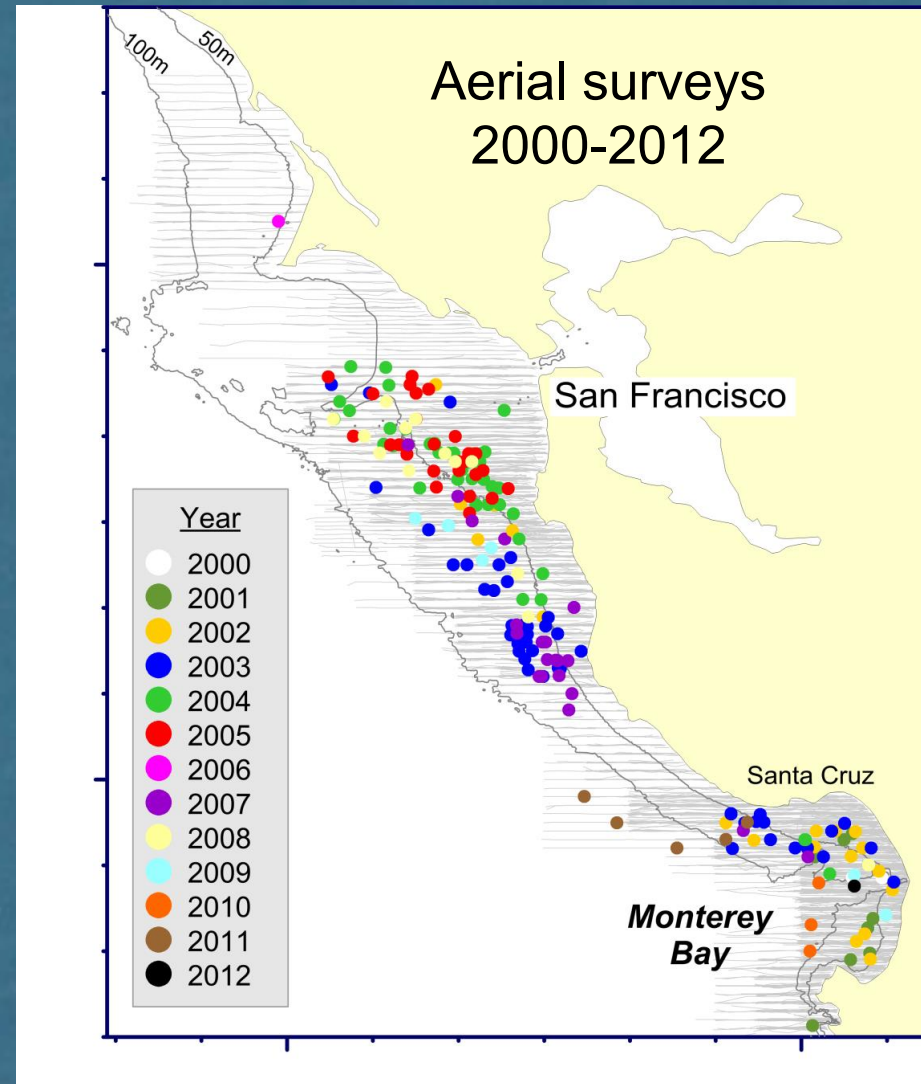
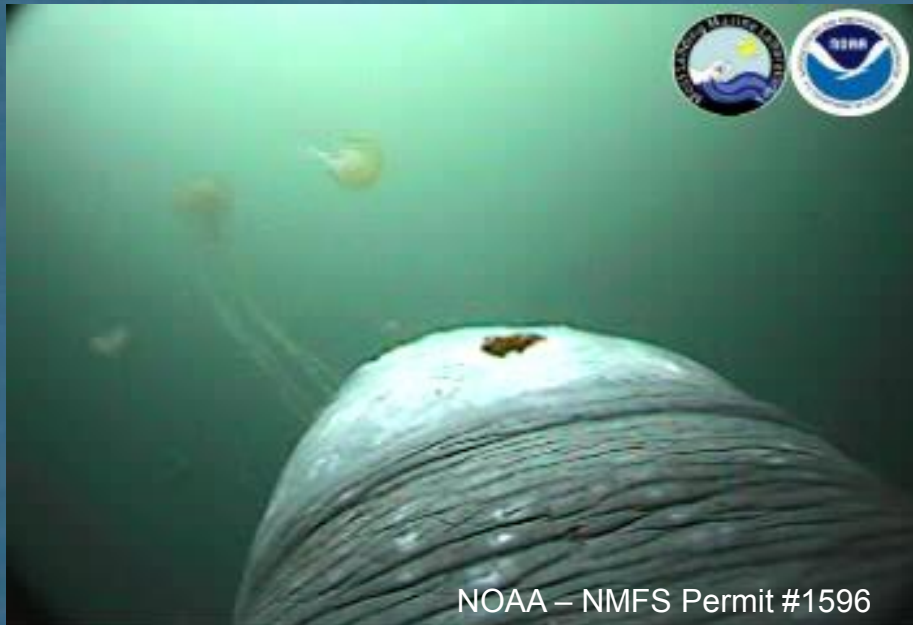


"US West Coast" leatherbacks



Leatherback foraging habitats, behavior, and prey off central California

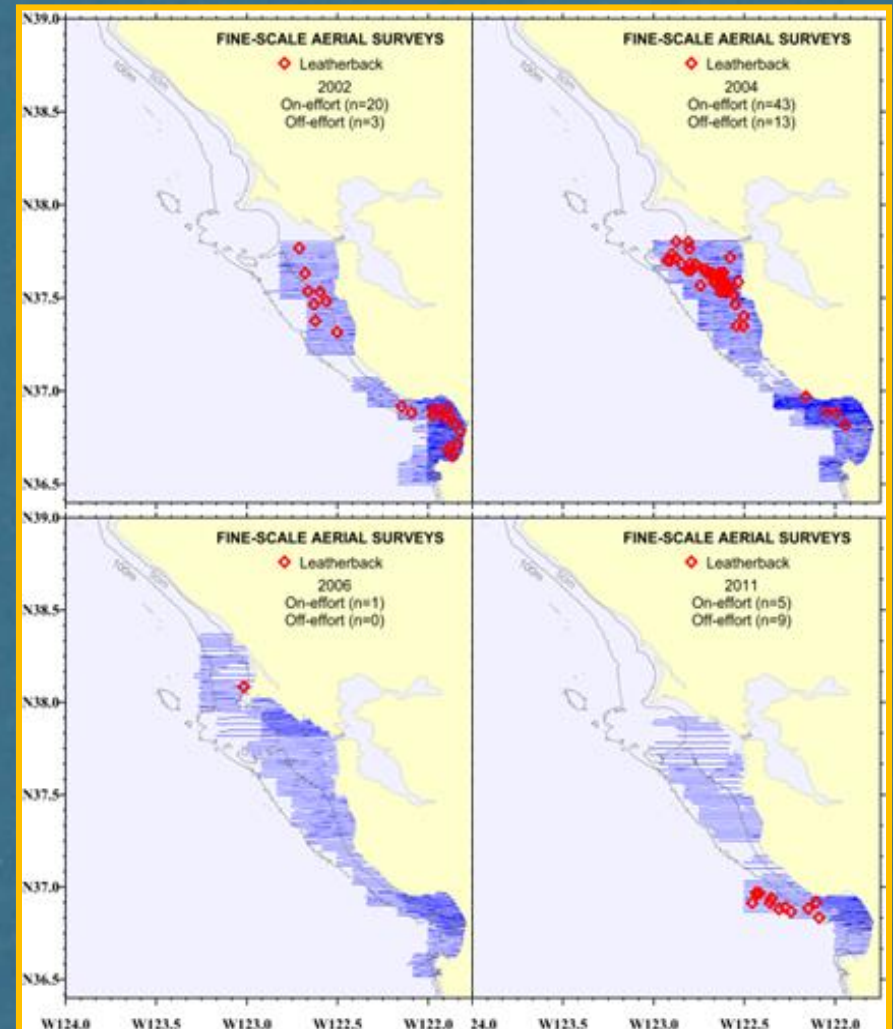
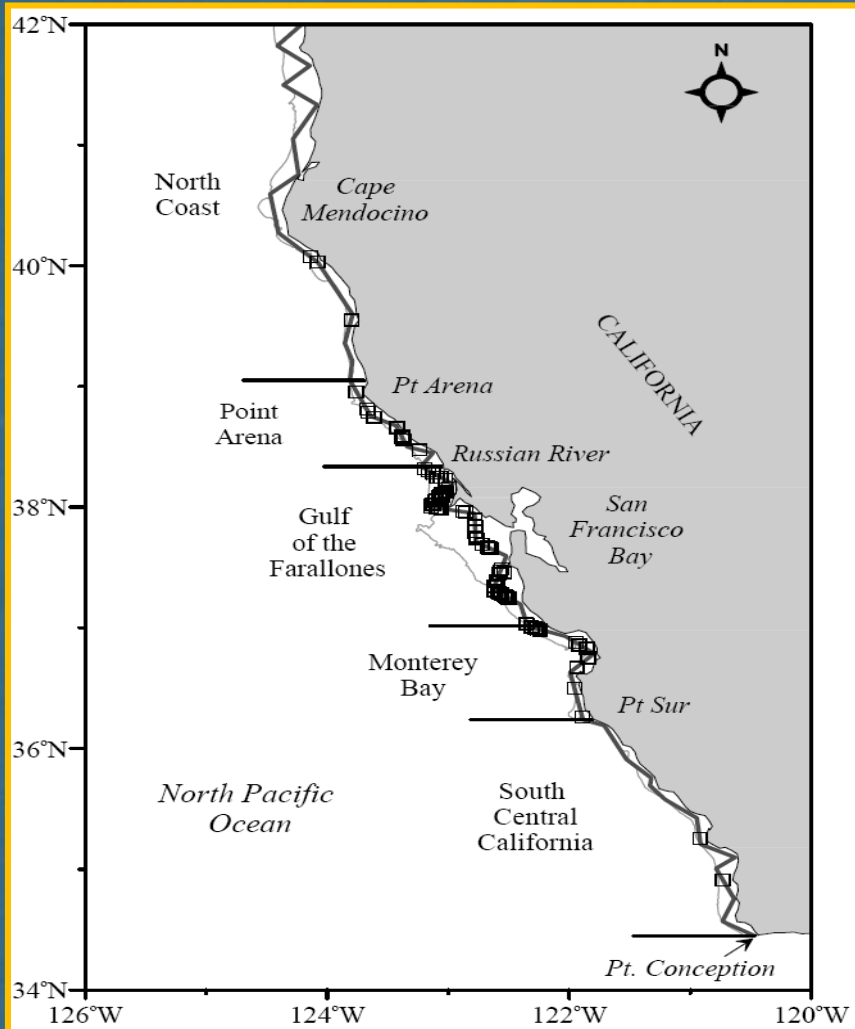
- Aerial surveys and animal-borne video
- Shelf habitat with abundant sea nettles (*Chrysaora fuscescens*)
- May - November foraging



Variability of leatherback distribution off central California

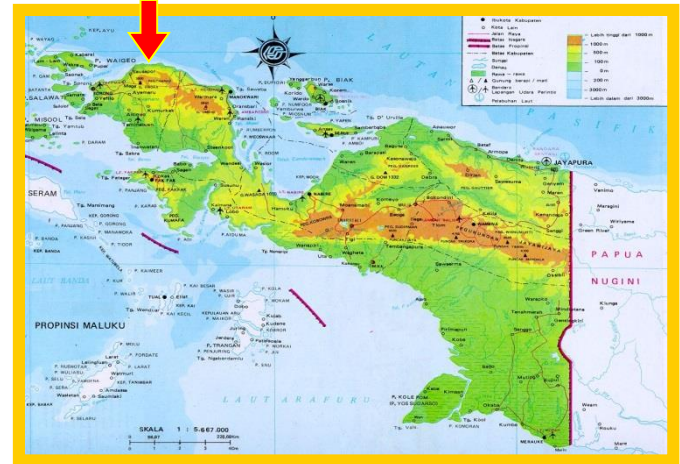
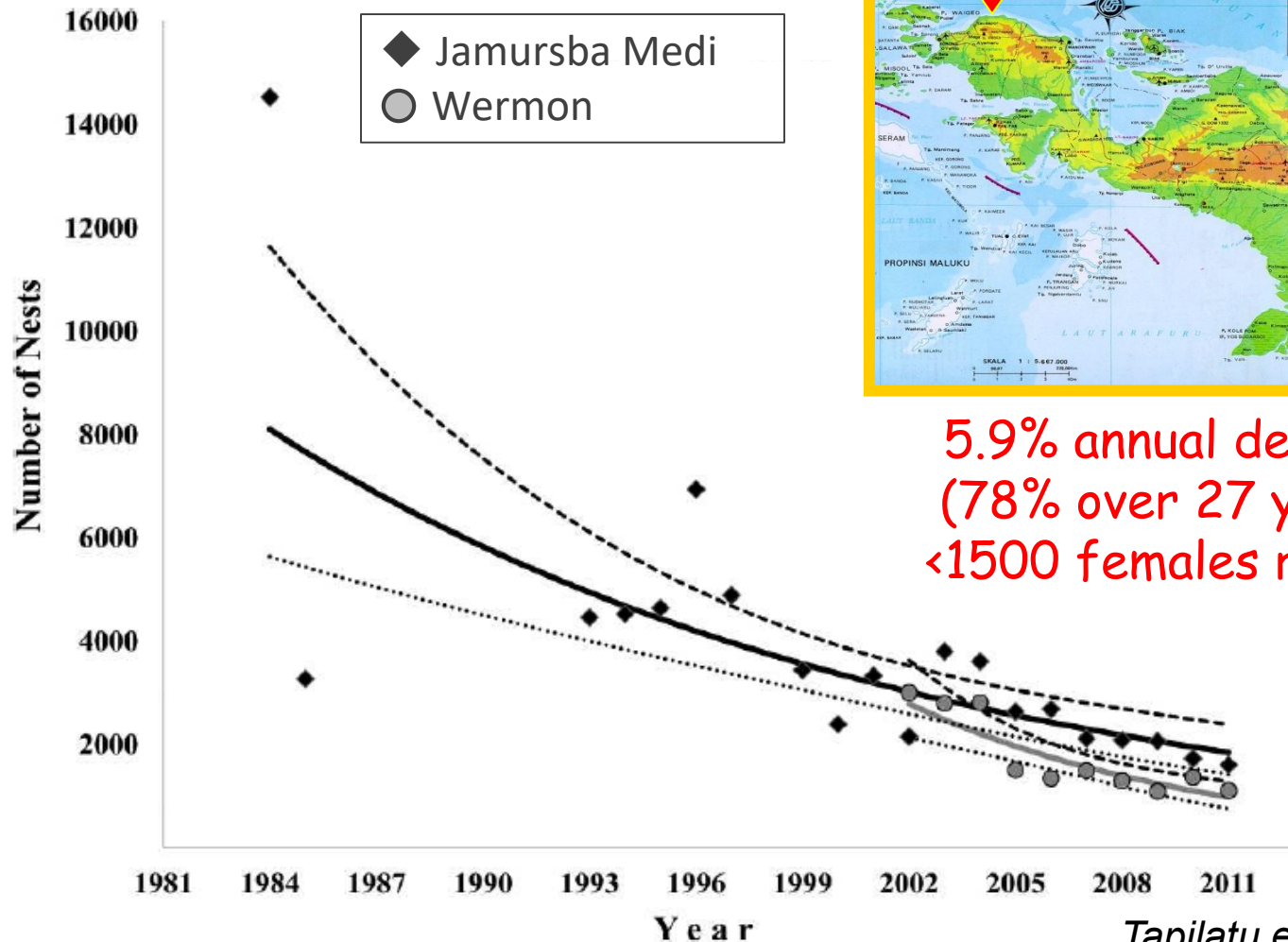
Long-term (1990-2016) aerial surveys along central and northern CA coast (see Benson et al. 2007)

Fine-scale surveys off central CA in leatherback foraging 'hotspots' (vary by year)



Leatherback Nesting Trends, 1984-2011

Bird's Head Peninsula, Papua Barat, Indonesia



5.9% annual decline
(78% over 27 years)
<1500 females remain

Tapilatu et al. 2013

Threats to **endangered** leatherback turtles

Fishery by-catch



Egg harvesting



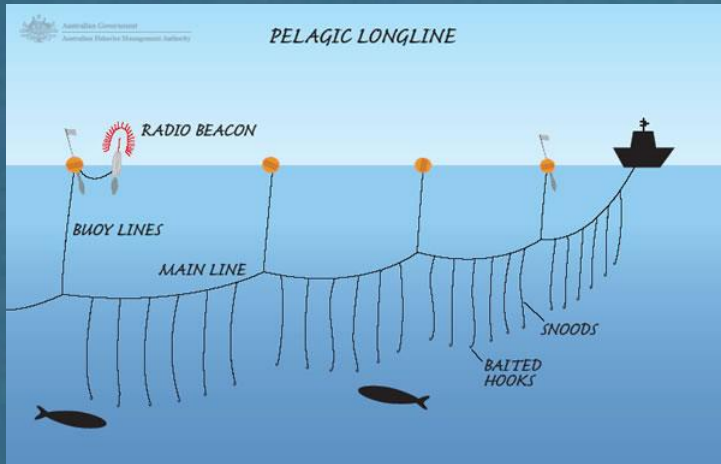
Egg predation



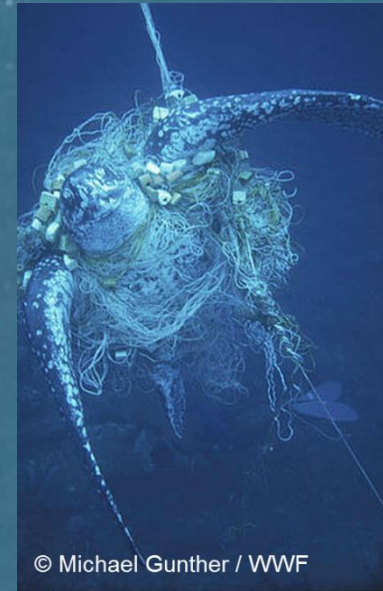
Beach erosion



Priority Action item #1: Reduce Fishery Interactions

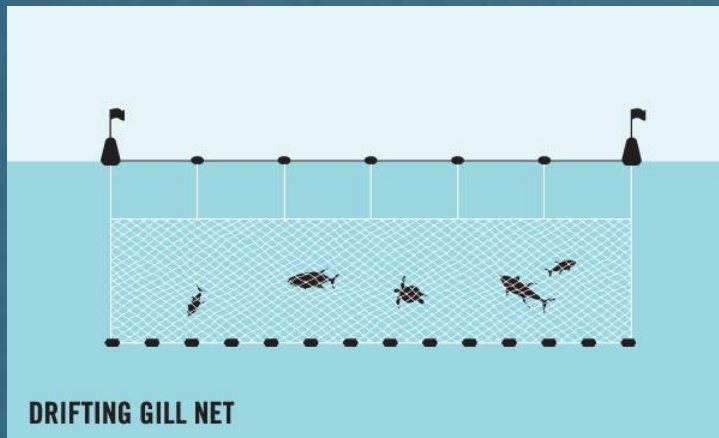


Pelagic longline and gillnet fisheries: swordfish and tunas



Coastal gillnet and fixed gear fisheries

© Michael Gunther / WWF



Dianne Arrigoni

Leatherback entanglements and CA fixed gear fisheries

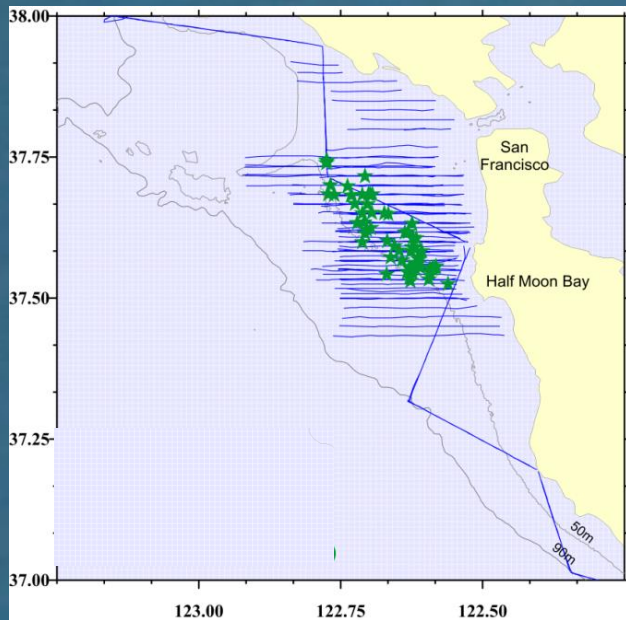
- Leatherbacks present off CA ~May-November
- Fixed gear entanglements in central CA:
 - Sep 2015: (top photo) dead leatherback in unidentified fixed gear
 - April 2016: (bottom photo) leatherback released alive from CA Dungeness crab gear by fisherman.
 - Nov 2016 (unconfirmed): one leatherback tagged as part of our studies may have died in Dungeness crab gear off Half Moon
- Turtles are notorious for getting tangled in rope in all oceans, but chance of detecting entanglements is low.
- Given leatherback's highly endangered status, <1 death per year along U.S. West coast would prevent population recovery (Curtis et al. 2015)



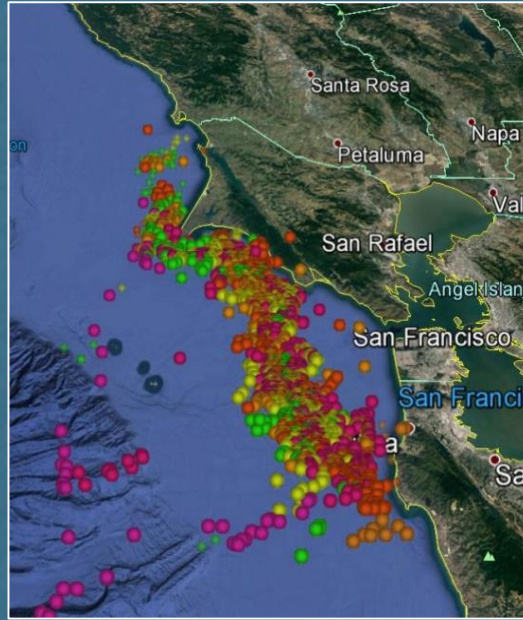
How can we mitigate leatherback entanglement risk in fixed gear fisheries during fall and spring?

- GOOD NEWS: We have the research and monitoring capacity
- Our past research has demonstrated that tagging studies and aerial surveys can provide the data we need to understand and mitigate leatherback entanglement risk in nearshore waters (for RAMP?)

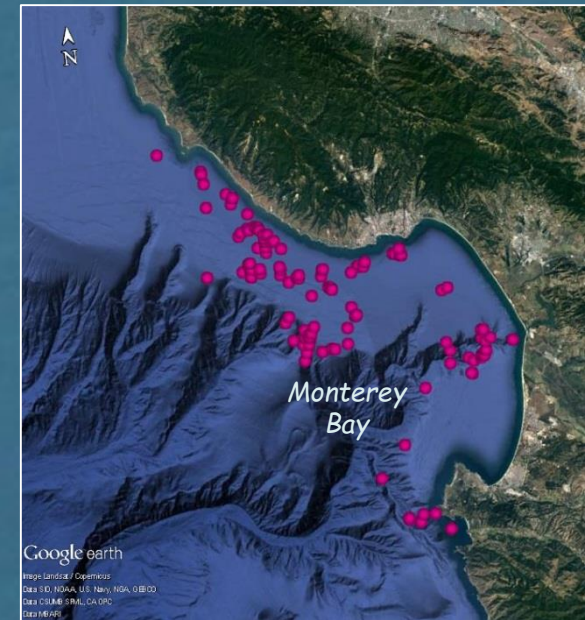
September 2016:
Aerial survey sightings of
leatherback turtles



Sep - Nov 2016:
telemetry locations
(5 leatherbacks)

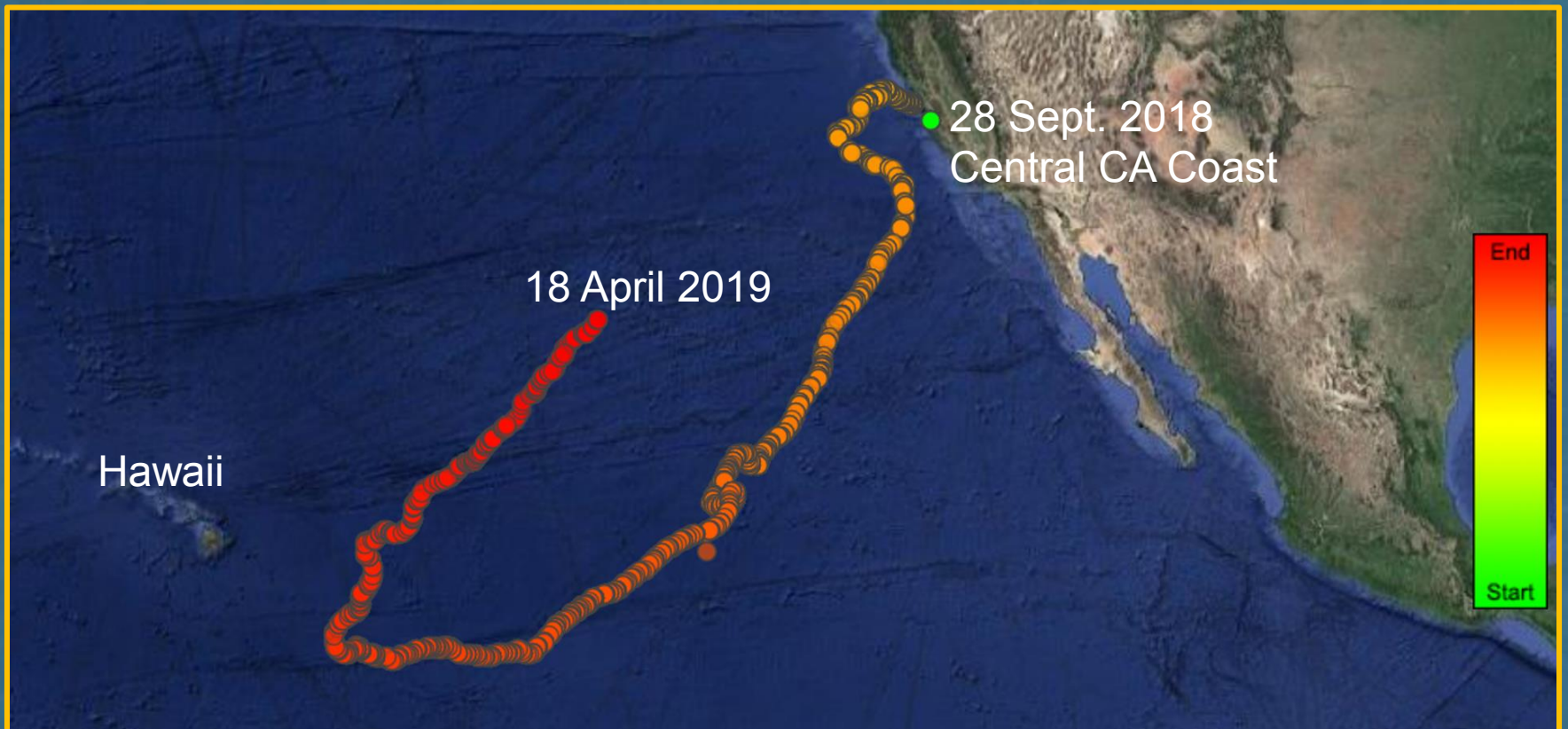


June 2017: telemetry
locations for 1 returning
leatherback



Seasonal timing . . .RAMP style

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
FISHERIES	DCRAB Fishing Season	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Light Blue	Light Blue	Light Blue
	Commercial Salmon Season?	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Red	Red	Red	Red	Light Blue	Light Blue
WHALES	Humpback Whale Migratory Presence	Light Purple	Light Blue	Light Blue	Light Blue	Light Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple
	Gray Whale Migratory Presence	Light Blue	Orange	Orange	Orange	Orange	Orange	Light Orange	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
	Blue Whale Migratory Presence	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Blue	Blue	Blue	Blue	Blue
TURTLES	Leatherback turtle	!	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Green	Light Green	Green	Green	Green	Green





Questions?

Please report
turtle sightings to
Scott.Benson@noaa.gov or
swfsc.turtle-sightings@noaa.gov

THANK YOU!

