



Distribution and Habitat Characteristics of the Indo-Pacific Humpback Dolphin, *Sousa chinensis*, in the Northern Beibu Gulf, China

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Animal distribution

- Population status (IUCN, 2001)
- Habitat use, function
- food resource: availability, accessibility
- Social interactions
- Inter-species interactions
- Inter-patch mobility





Indo-Pacific humpback dolphin

- *Sousa chinensis*, Chinese white dolphin (**CWD**) in China, pink dolphin in the South-East Asia
- Obligatorily coastal-inhabiting species: < 20m
- preference to shallow and highly-productive waters (Jutapruet et al., 2017; Wu et al., 2017a)





CWD in estuarine habitat

- Commonly reported over species' distribution range (western Taiwan, Chinese SE coast, SE Asia)
- No direct, quantitative, statistically significant connection





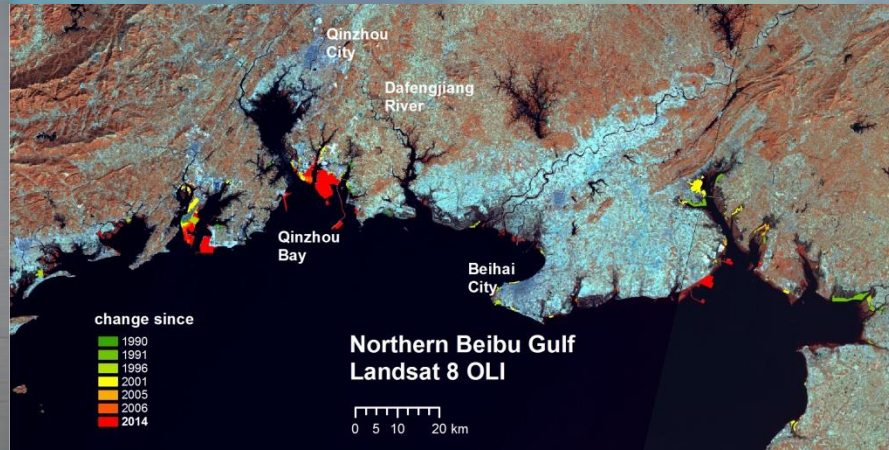
CWB in northern Beibu Gulf

- Sanniang Bay (SNB)-Dafengjiang River Estuary (DRE), Hepu Dugong Reserve
- intense Dolphin-watching tourism
- substantial habitat loss/change

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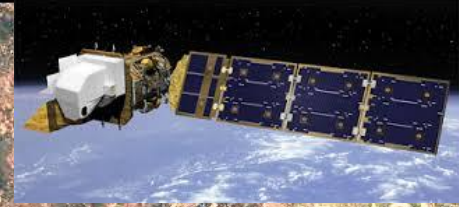
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We are interesting to

- habitat preferences in the SNB-DRE area
- Distribution tendency to habitat characteristics
- Empirical connection between habitat preferences and estuarine features



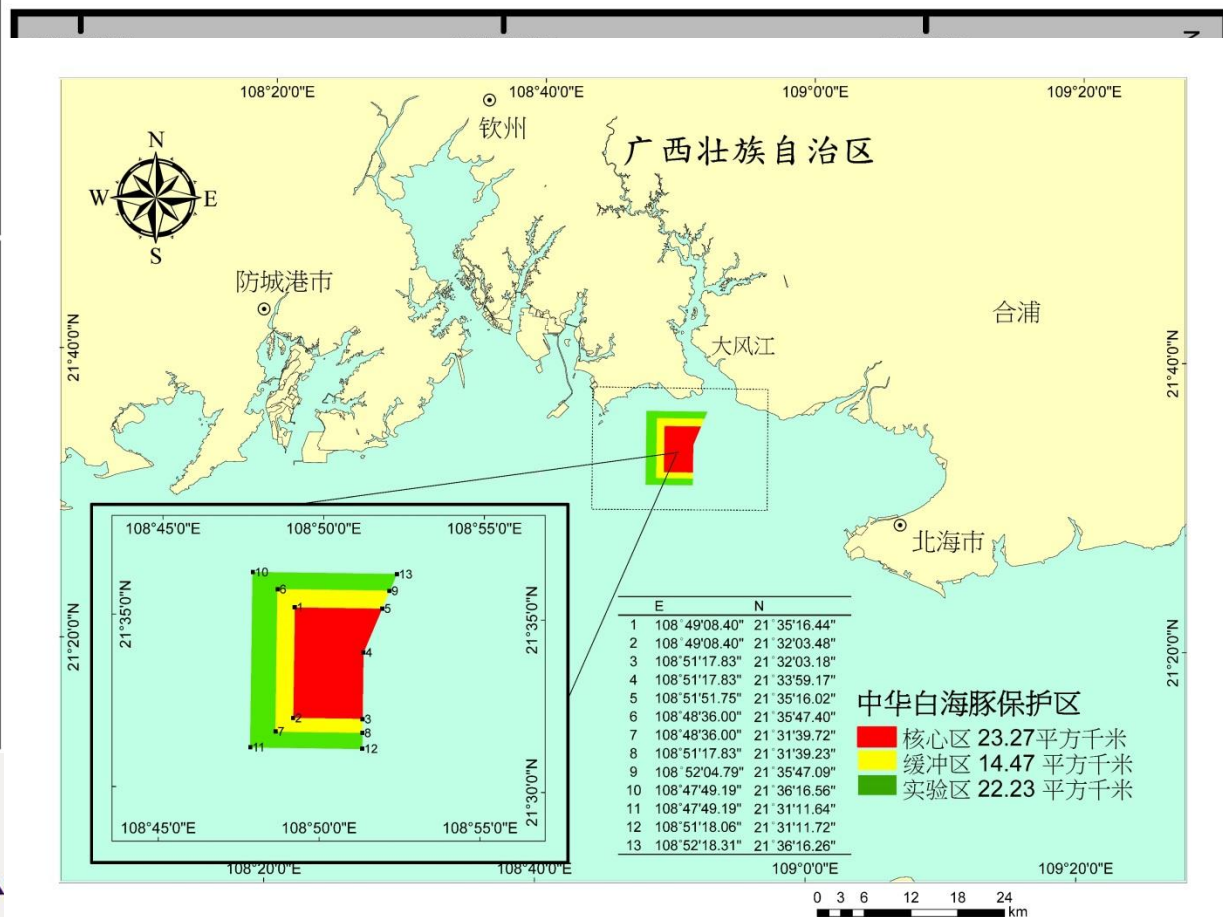
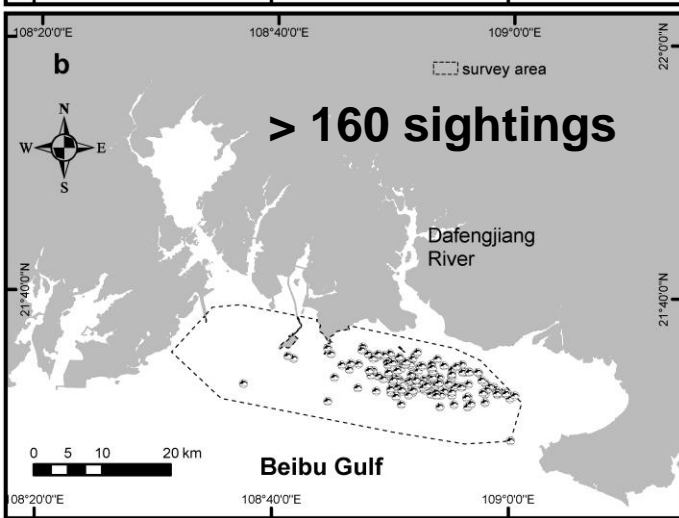
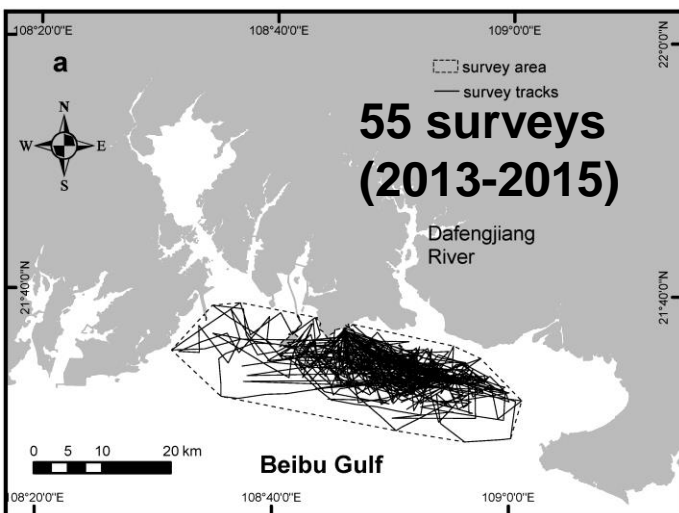


Field surveys

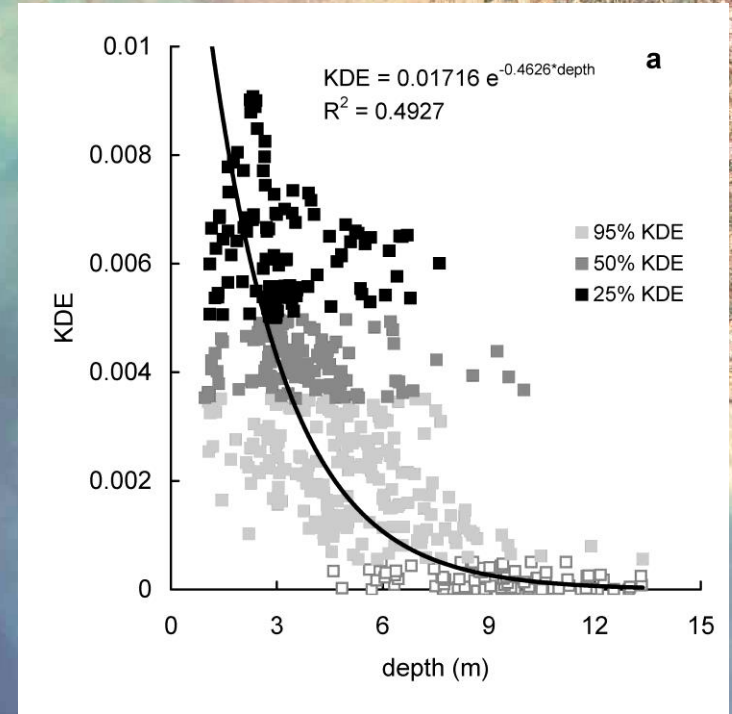
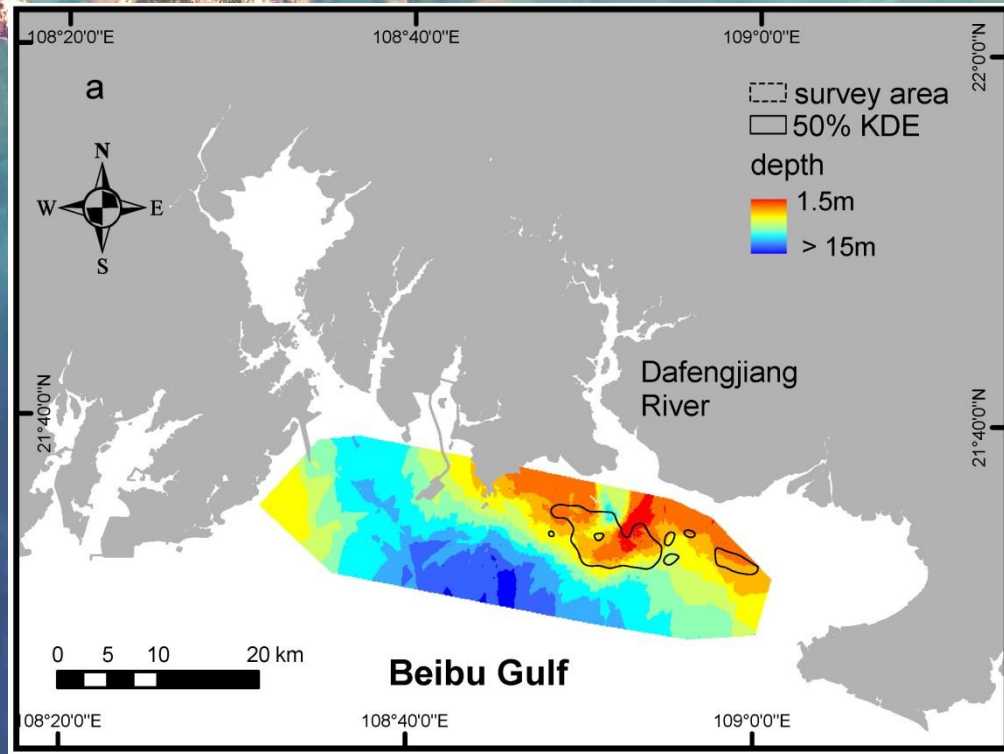
- 2013 - now
- Systematic surveys: Zig-zag line
- Habitat features: GPS, SST, sal, depth, DO, every 4-5km
- Chl-a: August, October, December 2015
- Remote-sensing: chla, SST



Sightings and distributions

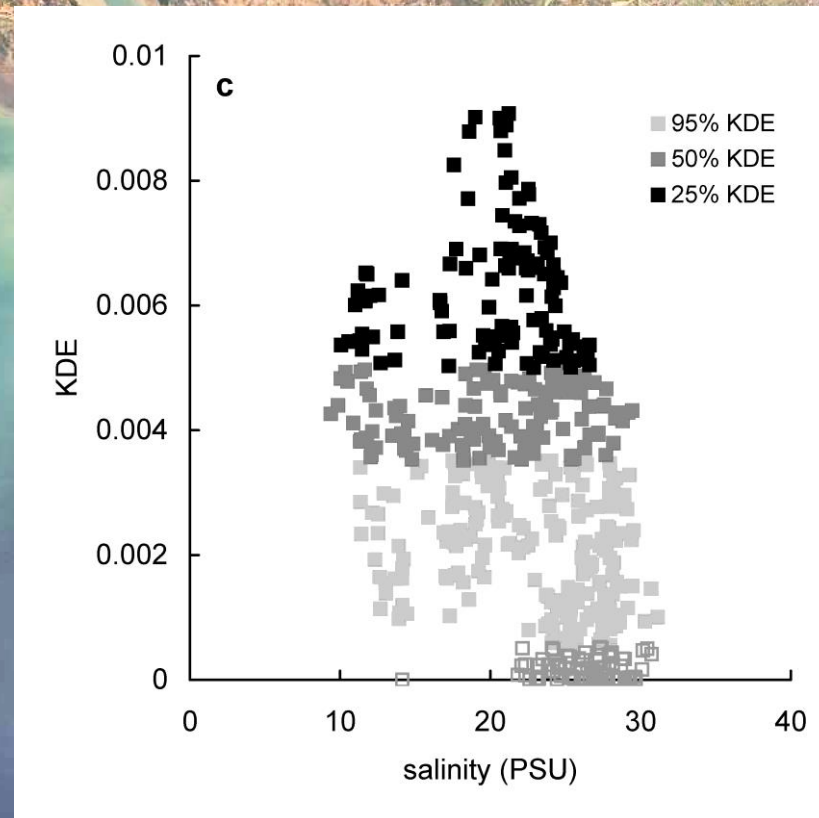
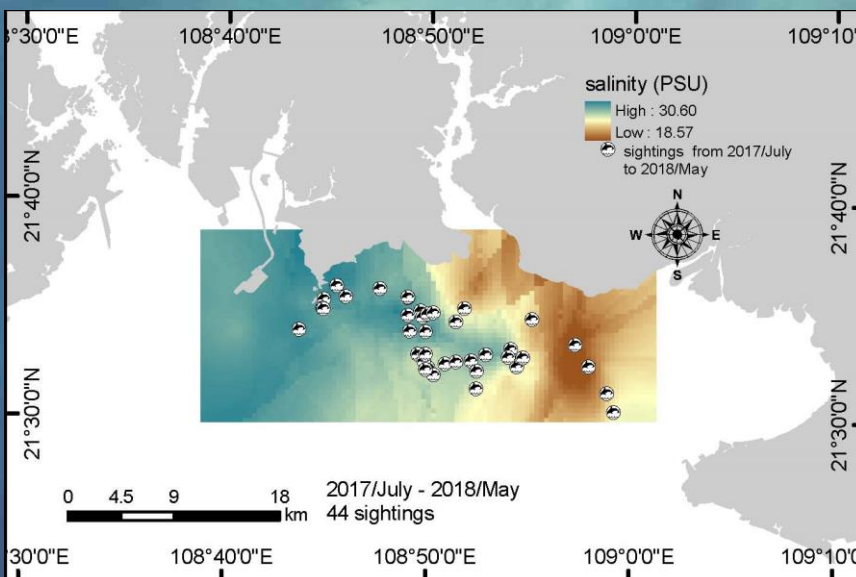
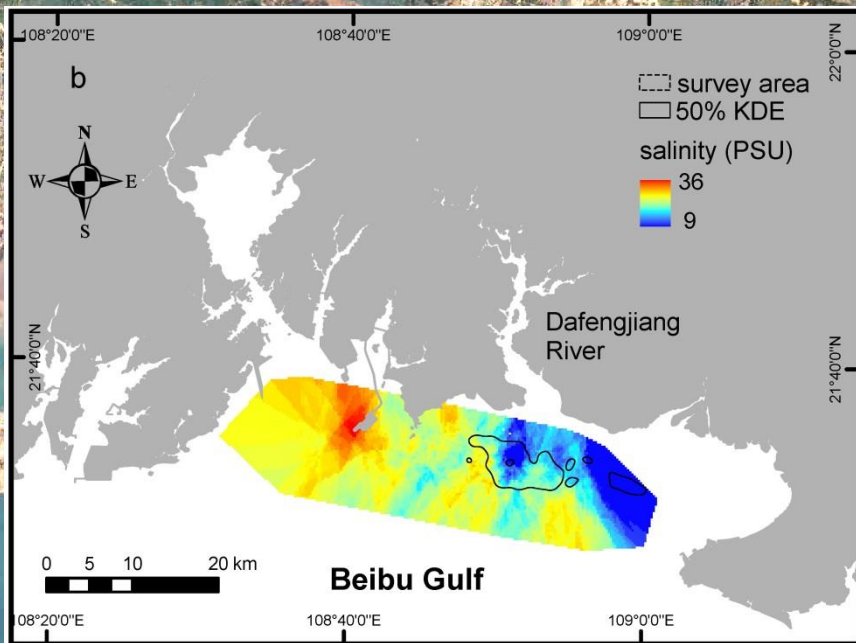


Bathymetry and distribution



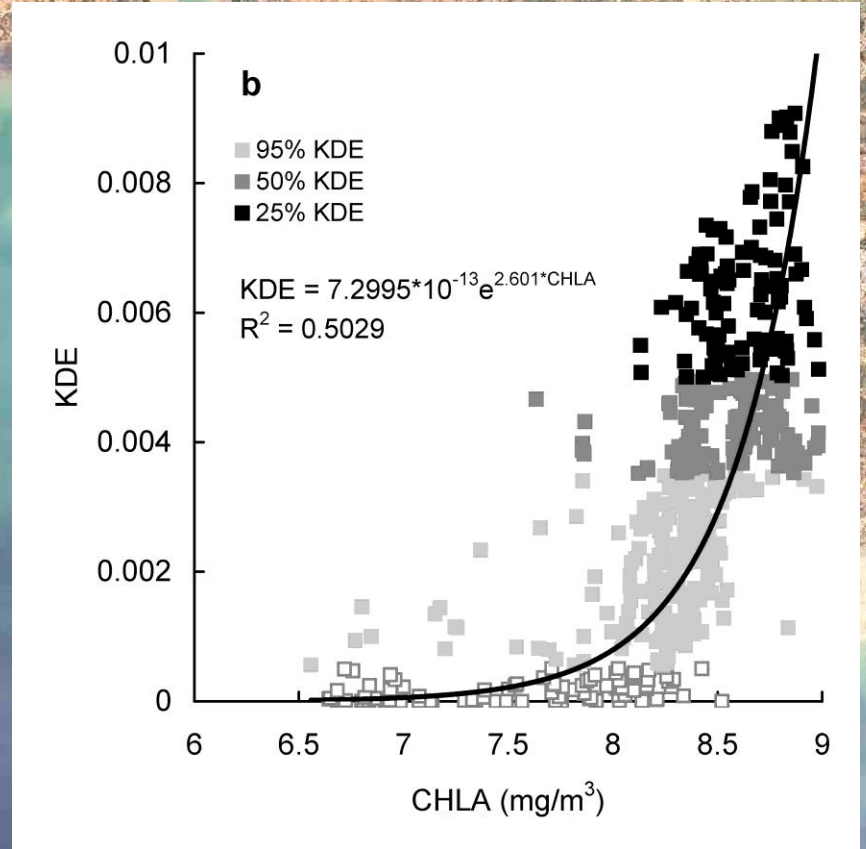
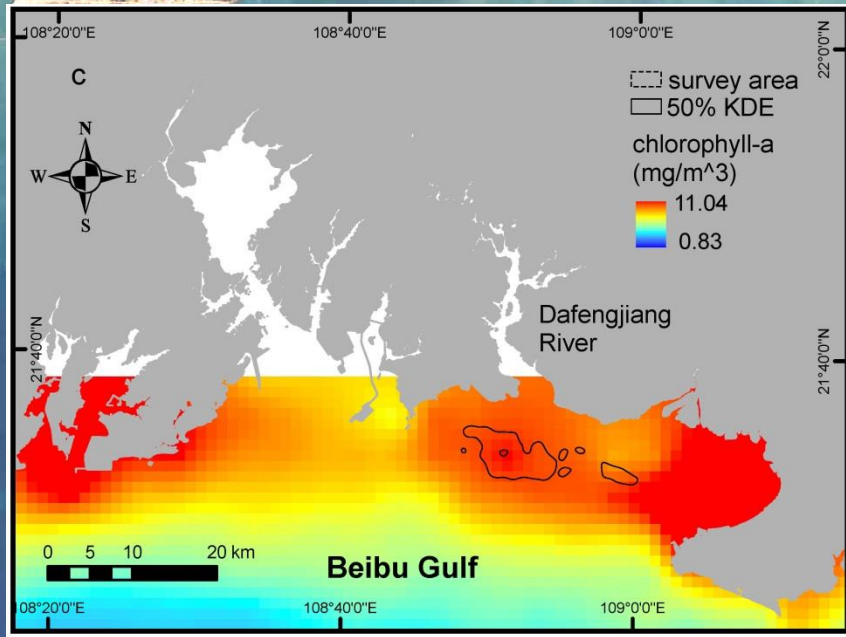
Underwater sandbar at DRE

Salinity



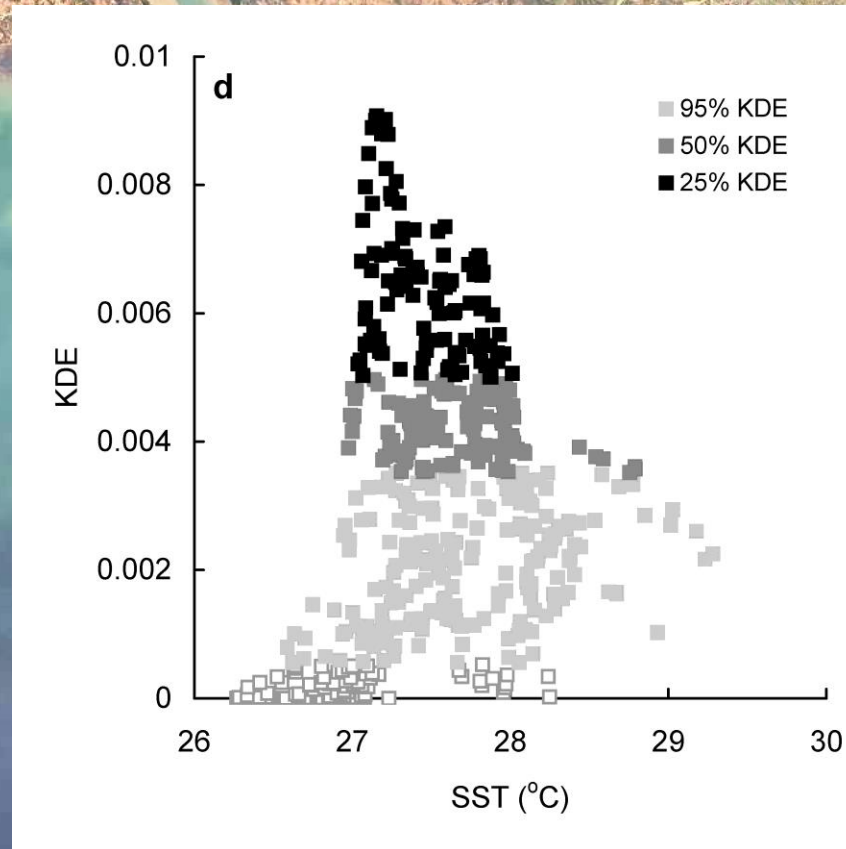
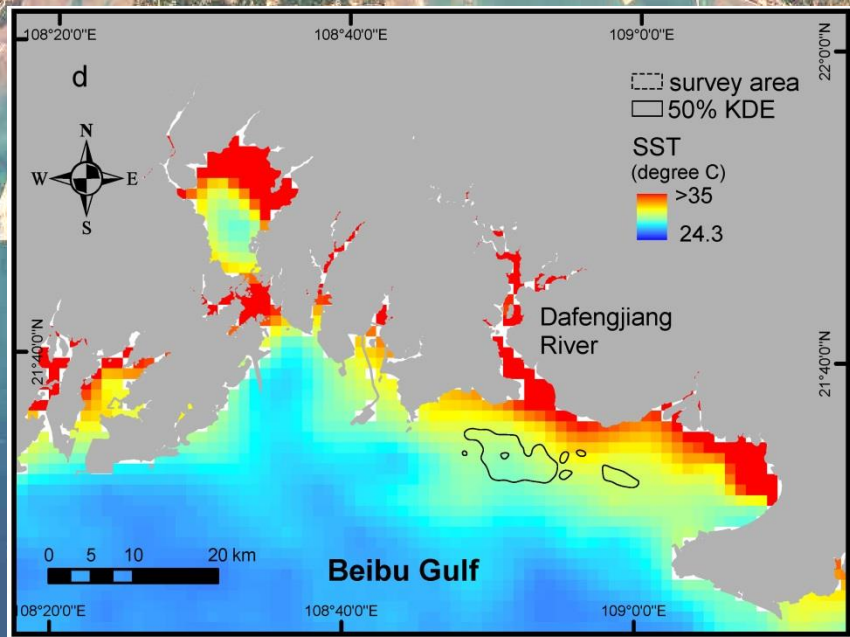
Mixing zone of freshwater and seawater

MODIS A: Chla



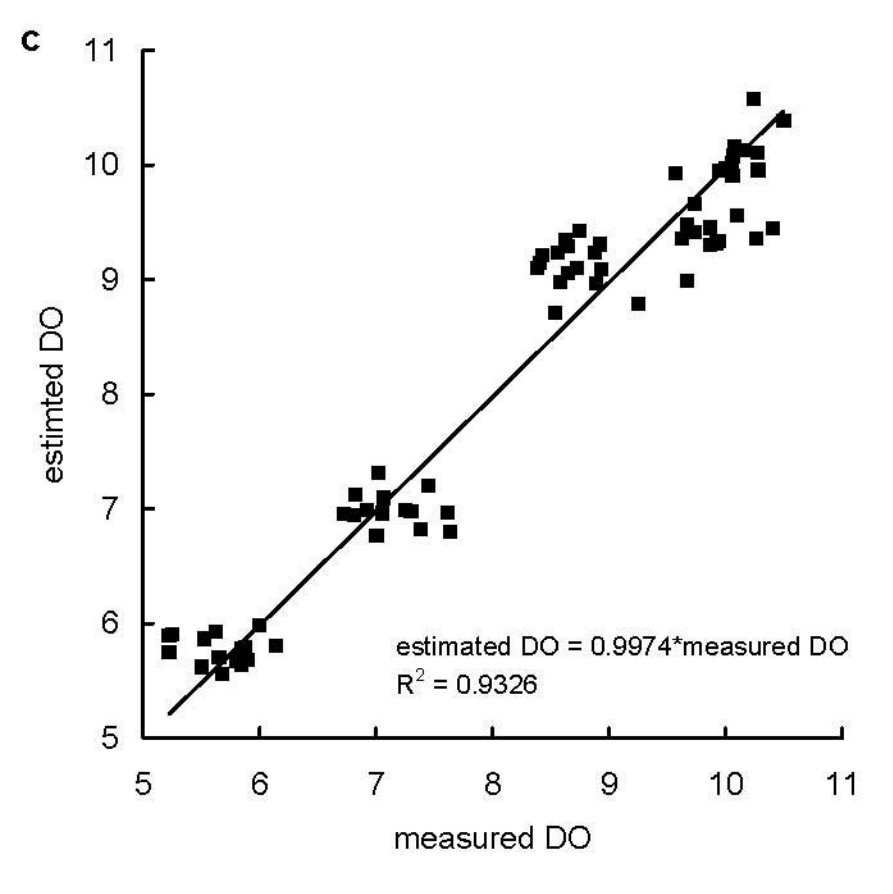
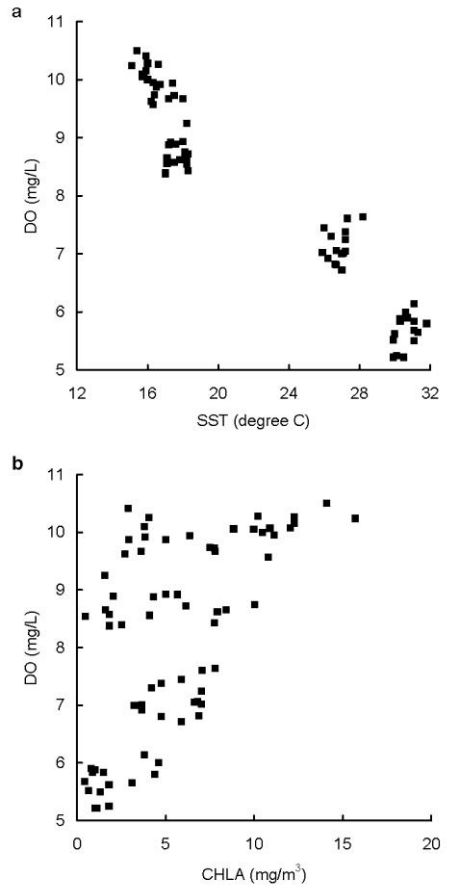


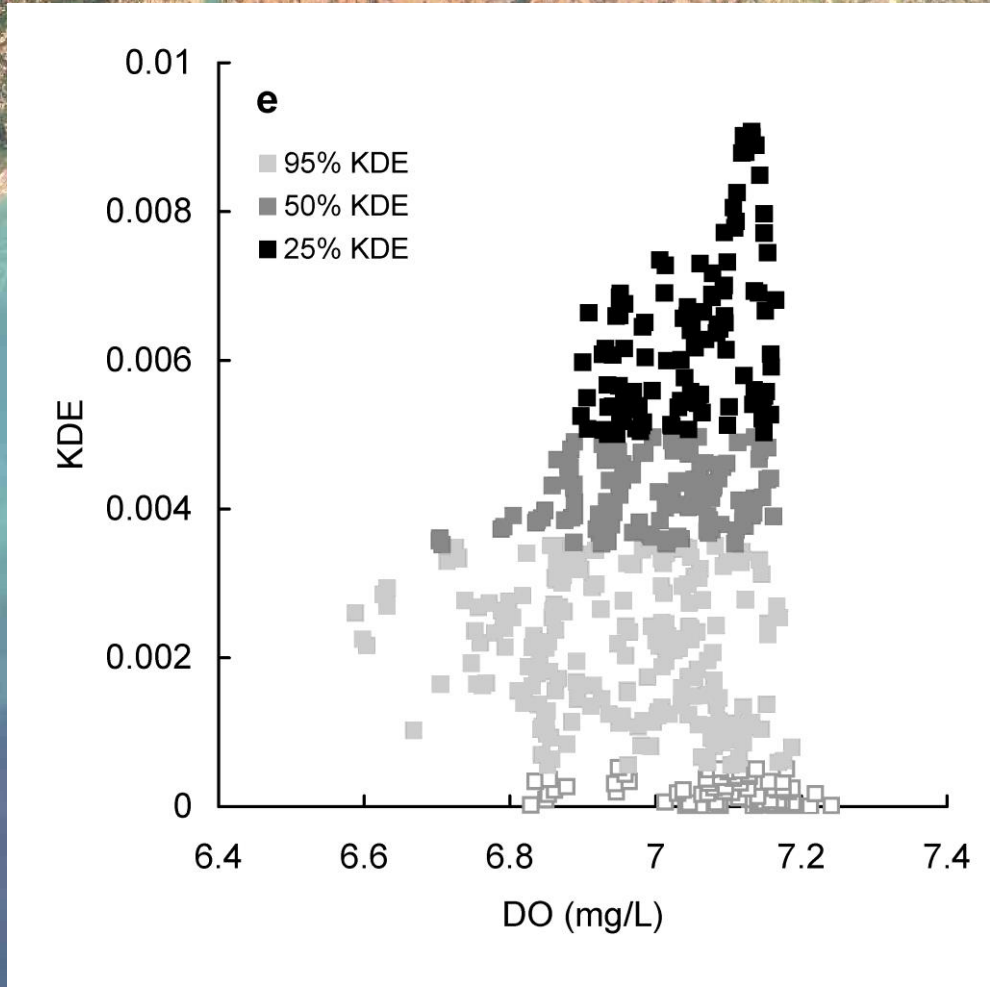
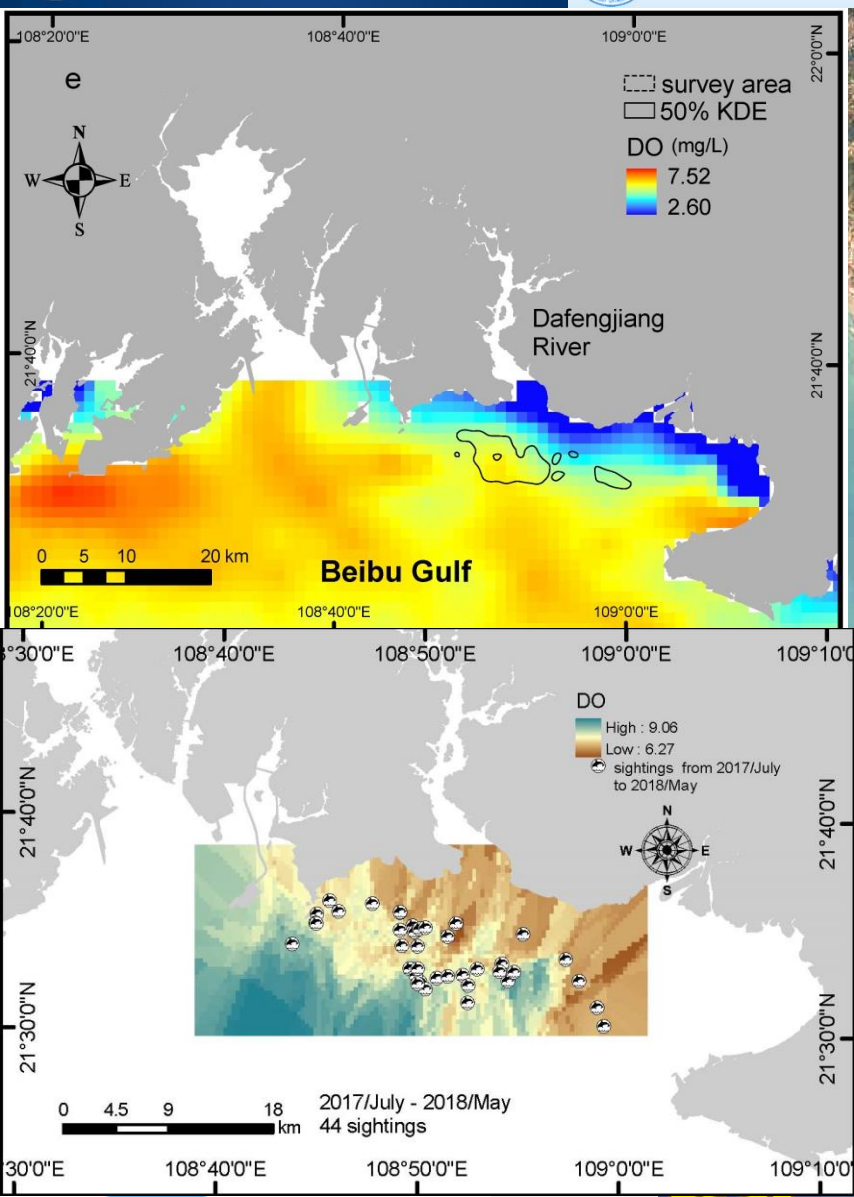
MODIS-A: SST

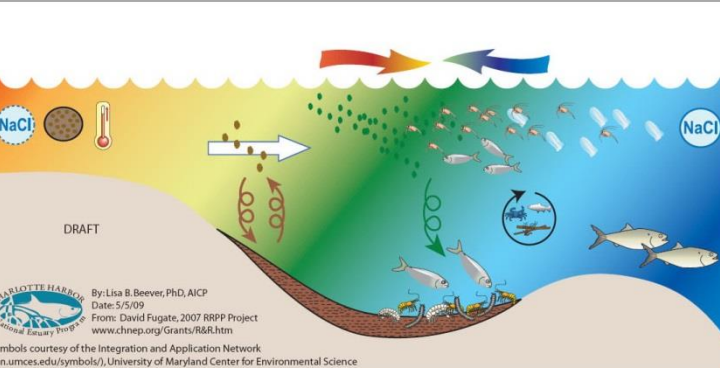




$$DO = 13.1134 - 0.2440 * SST + 0.0731 CHLa$$







Estuarine Turbidity Maximum (ETM)

Estuaries trap sediment in high concentrations at localized regions called estuarine turbidity maximums (ETMs), which change location relative to river flows, tides, resulting salinity gradients, suspended solids, and temperature. There is a mobile pool of sediments that moves with river flows and tides. Nick points (drops in bathymetry) cause sediments to drop from the water column, accumulating as bottom sediments. Turbulence causes re-suspension.

The ETM is a site of high productivity of phytoplankton, the base of the water column estuarine food web. Copepods and other zooplankton feed on the phytoplankton, then provide food for juvenile fish and mobile predatory invertebrates. Phyto- and zoo-plankton casts and animal frass precipitate from the water column, contributing to the detrital accumulation. This area is a nursery hot spot for growing fish! The nursery hot spot may not be directly under the mobile ETM. Many fish species leave the estuary for life in the Gulf of Mexico and other seas as adults.

The position of the ETM within the river is critical to maintaining estuarine productivity. If freshwater flows are too low, food webs can become compressed, leaving little food for juvenile fish. If the freshwater flows are too high, the ETM can get pushed out of the river system, where there is insufficient habitat.



Population Size and Habitat Characteristics of the Indo-Pacific Humpback Dolphin (*Sousa chinensis*) Off Dongxue, Surat Thani, Thailand

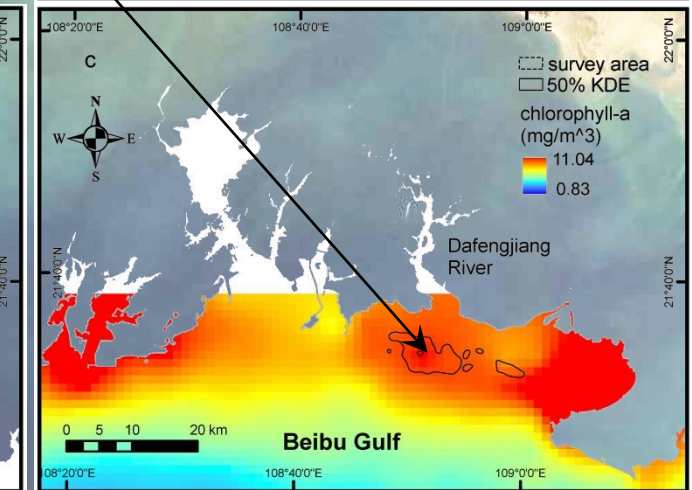
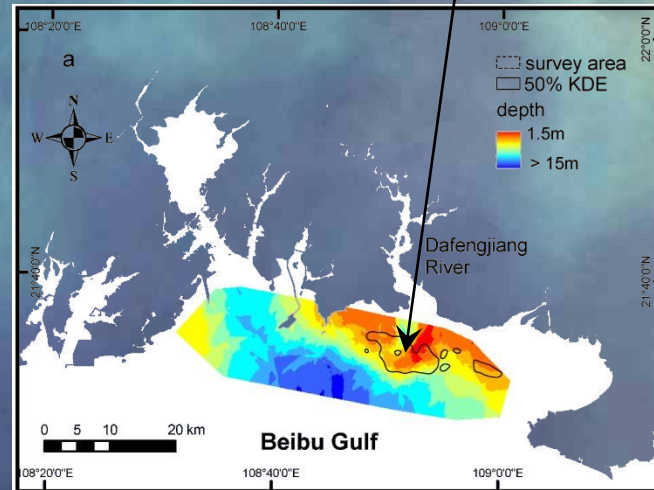
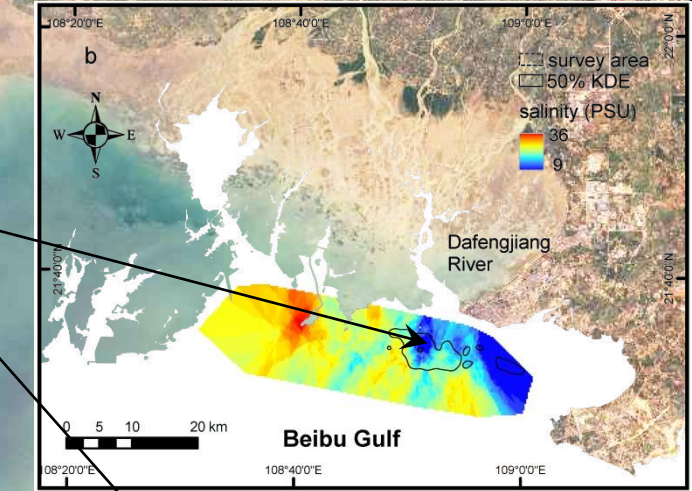
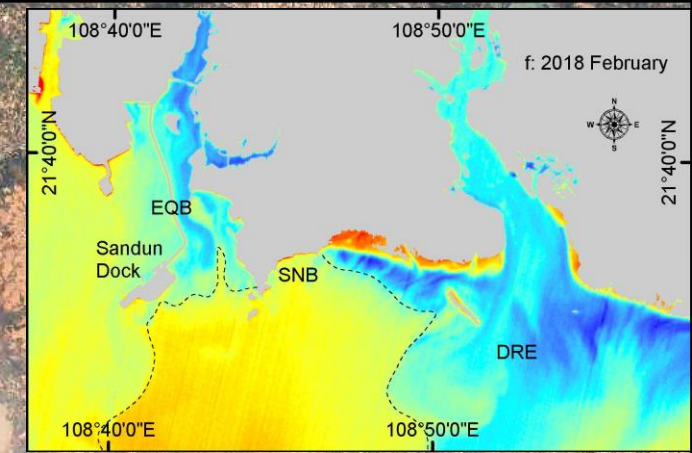
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Abstract

Investigation on the distribution, population size, and habitat characteristics of several populations provide the baseline for several conservation management. Southeast Asia is considered an important habitat for Indo-Pacific humpback dolphins (*Sousa chinensis*), but information regarding their population size and habitat characteristics is limited. The present study investigated the distribution and habitat characteristics of humpback dolphins off East Thailand, and estimated the population size based on photo-identification records. Using the capture-mark-recapture method, the population size of the humpback dolphins of Thailand was estimated to be 193 (95% CI: 149–248) confidence intervals with 90 juveniles, 40 subadults, and 59 adults. The proportion of juveniles was significantly higher than the adult humpback dolphin population size in the investigated area is likely higher than this estimate. Principal component analysis of the environmental characteristics indicated that the adult dolphins tend to occur in deeper and clearer water relative to the juveniles and subadults. Monitoring of the coast environment and habitat characteristics are important to ensure the survival and development of the young dolphins. Further study on the environmental characteristics may be particularly beneficial for younger dolphins. This study provides a baseline for future conservation management.

Key Words: Indo-Pacific humpback dolphin, *Sousa chinensis*, distribution, subspecies, habitat characteristics, photo-ID, population size, Thailand





Ecological feature of the DRE ETM (Estuarine Turbidity Maximum)


- Underwater sandbar
- Freshwater mixing
- High NPP
- Prey resources
- High feeding efficiency



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