IS THERE ECOLOGICAL RELATIONSHIP BETWEEN THE CORAL REEF AND FISH FAUNA?

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Introduction and Objectives

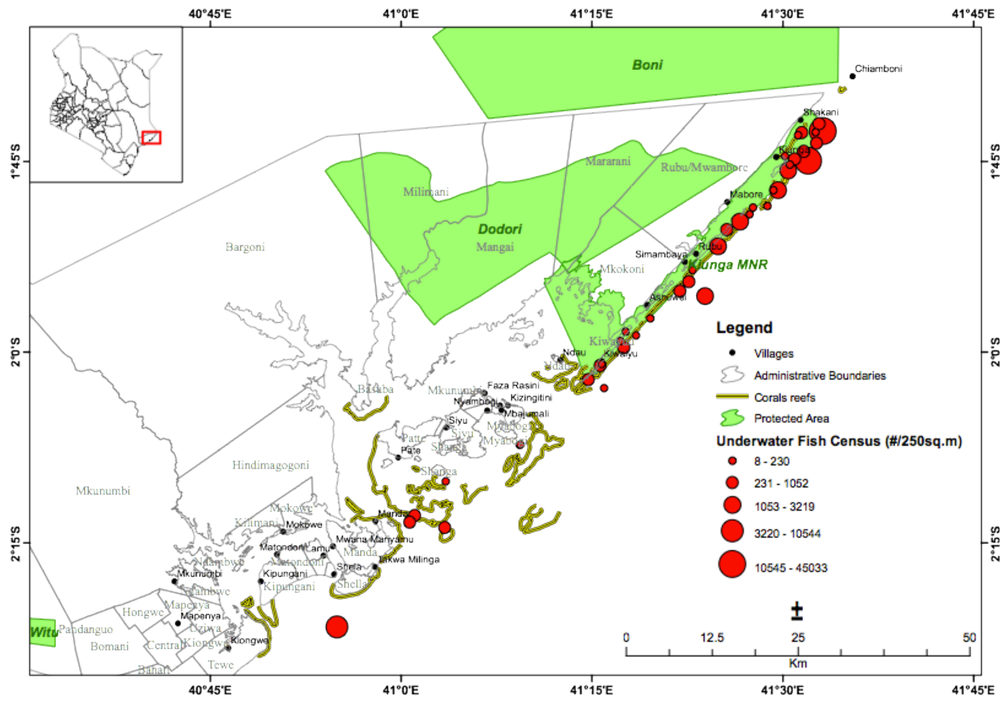
Kiunga Marine National Reserve, Kenya:

- Located at the at coral transition ecotone
- Two distinct monsoon seasons and an upwelling zone
- High species density but less diversity
- Over 60% coral death during the 1998 mass coral bleaching

Objectives:

- Define the ecological status of the Kiunga MPA
- Describe coral community changes
- Describe the Kiunga artisanal fishery

➔ **In general, to challenge a number of assumptions**



Materials and Methods

Data collection

Line & point intercept transects:

- Fish Species visual census
- Invertebrates species
- Coral benthos categories
- Fisheries data – target species, catch volume & gear

Data collected annually between 2004-2009 at 40 monitoring sites

Statistical analysis

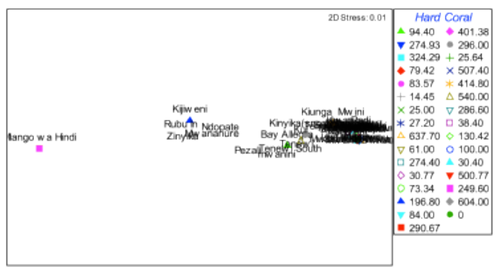
Primer 6 & R Softwares:

- Diversity indices
- ANOVA
- PCA
- MDS

- **Time Series Analysis**
- **Community changes:**
  - Fish Families
  - Benthic Community
- **Trophic levels:** Fish fauna
- **Species diversity:**
  - Invertebrates
  - Fish fauna
- **Coral health**
- **Coral recruitment**
- **Spatial & temporal trends**

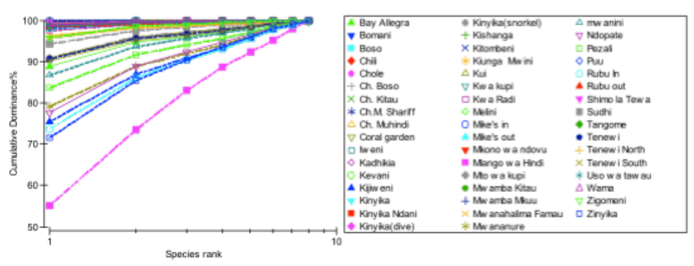
Anticipated & Preliminary Results

Enhanced understanding of post coral bleaching and recovery

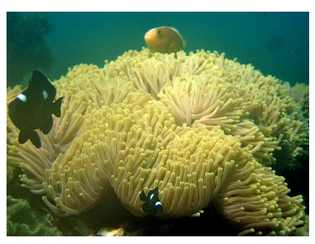


MDS Plot for Monitored Sites – Hard Coral as a Factor (2004-2009)

Description of fish fauna (trophic & species diversity) with coral benthos



Dominance Plot for Monitored Sites (2004-2009)



Provide ecological status of the Kiunga MPA

Assumptions Challenged

1. Less or no correlation between fish fauna and coral benthos in an upwelling zone.
2. Lower post bleaching recovery in comparison with other areas along the Kenyan coast.
3. Decrease in reef forming corals and algal dominance on coral reef located in an ecotone.
4. Fish fauna changes from carnivores/omnivores dominance to herbivorous dominance.
5. Decreased resilience of coral reef habitat to fisheries impacts.

Photos by Mike Olendo