

Overview of marine resource management issues for the Hauraki Gulf

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The Hauraki Gulf:

A hugely valuable matrix of marine conservation, island sanctuaries, recreational, customary and commercial activities

Many of which are dependent on the overall environmental quality of the Gulf itself.



World's first marine reserve



"To the international conservation world, the Leigh Laboratory has a special place because it was the first marine reserve anywhere....."
Gregory Stone, PhD, Chief Scientist for Oceans, Conservation International

Hauraki Gulf: toxic paradise?



NZ Herald August 2011

Dwindling fish stocks, toxic metal pollution and unsafe swimming - the Hauraki Gulf jewel has lost its lustre, according to the most comprehensive report into its health.

The State of the Gulf study found nearly all environmental indicators either worsening or remaining at already-poor levels of health.

For the first time, the three-yearly report on the gulf measured the state of the environment and fisheries compared with pre-European settlement.

Hauraki Gulf Forum chair John Tregidga said most of the environmental indicators, on their own, did not sound any alarm bells, but their cumulative effect was worrying.

"It is deteriorating, and we need to take notice of it - to urban expansion, farming practices, and the way the Ministry of Fisheries operates on the Hauraki Gulf."



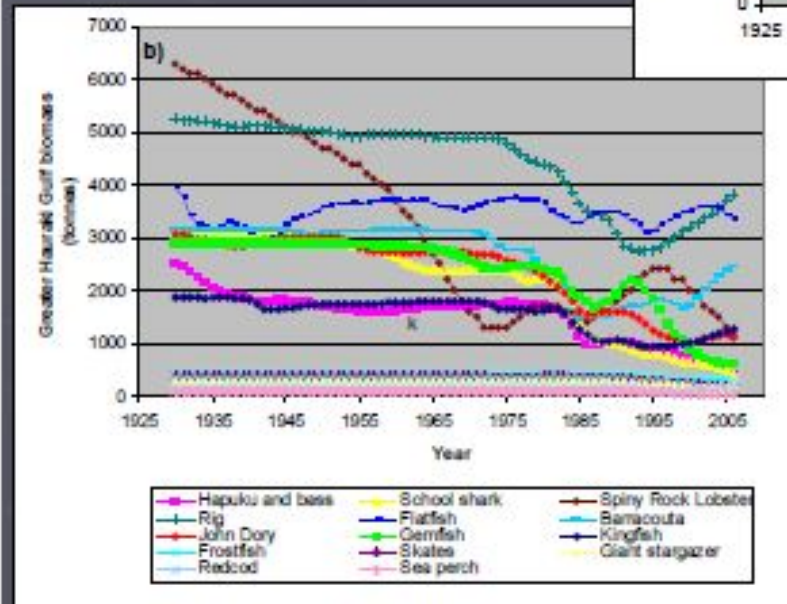
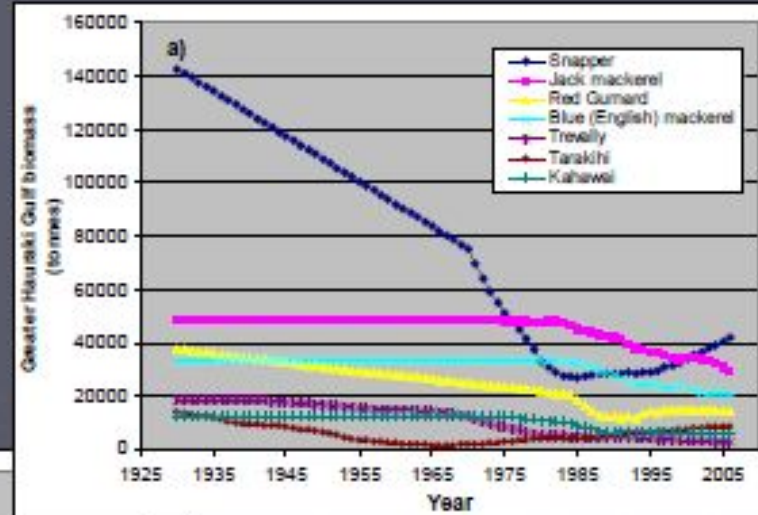
Marine Resource Issues for the Hauraki Gulf

1. Fishing
2. Sediment
3. Toxic pollutants
4. Nutrients
5. Microbial pollution
6. Introduced marine species
7. Noxious species
8. Litter
9. Protecting biodiversity
10. Coastal development
11. Others?



1. Fishing

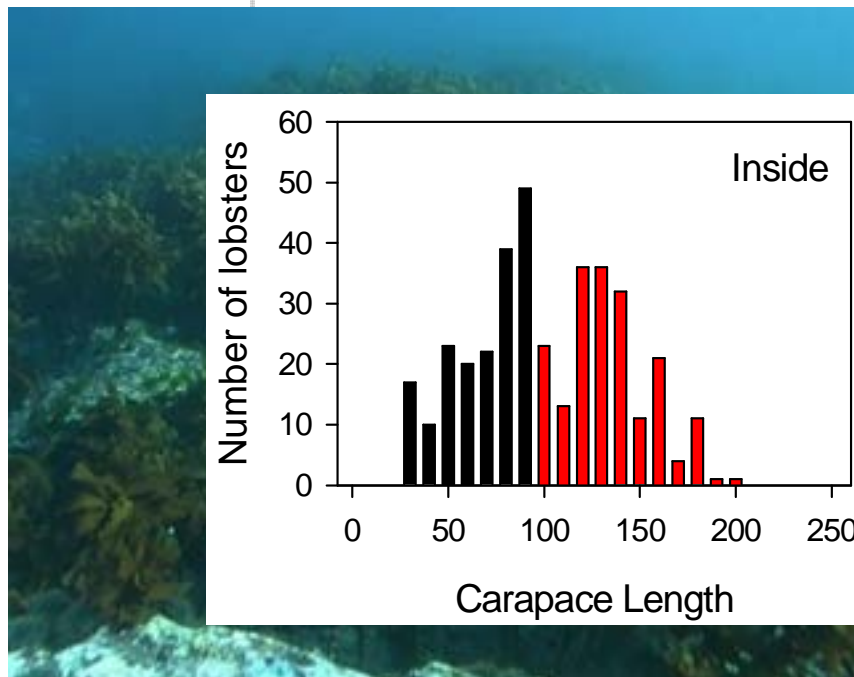
Historical models were driven by biomass trajectories of harvested species



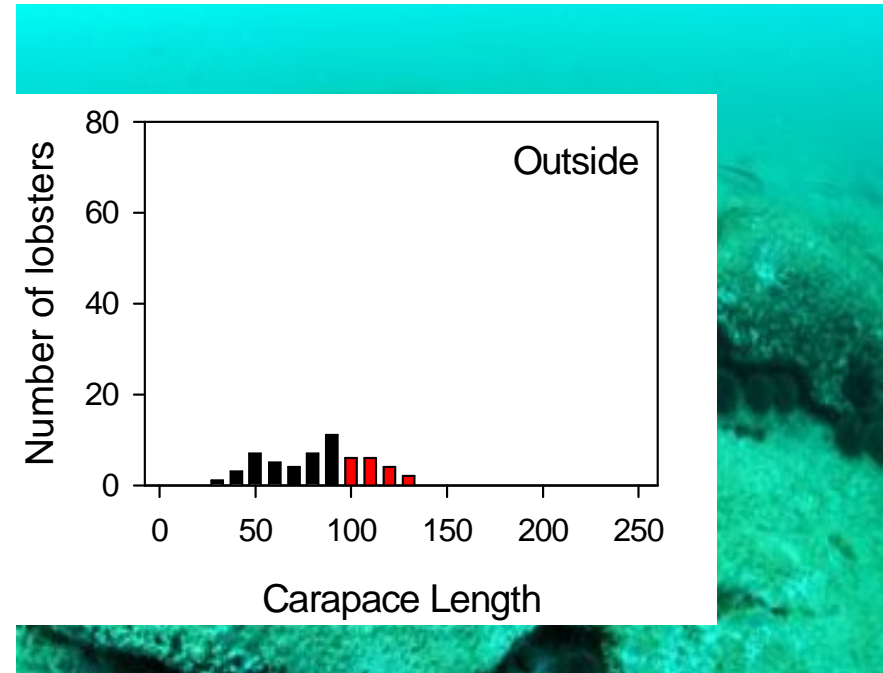
Especially large biomass decrease in snapper and rock lobsters



1. Fishing

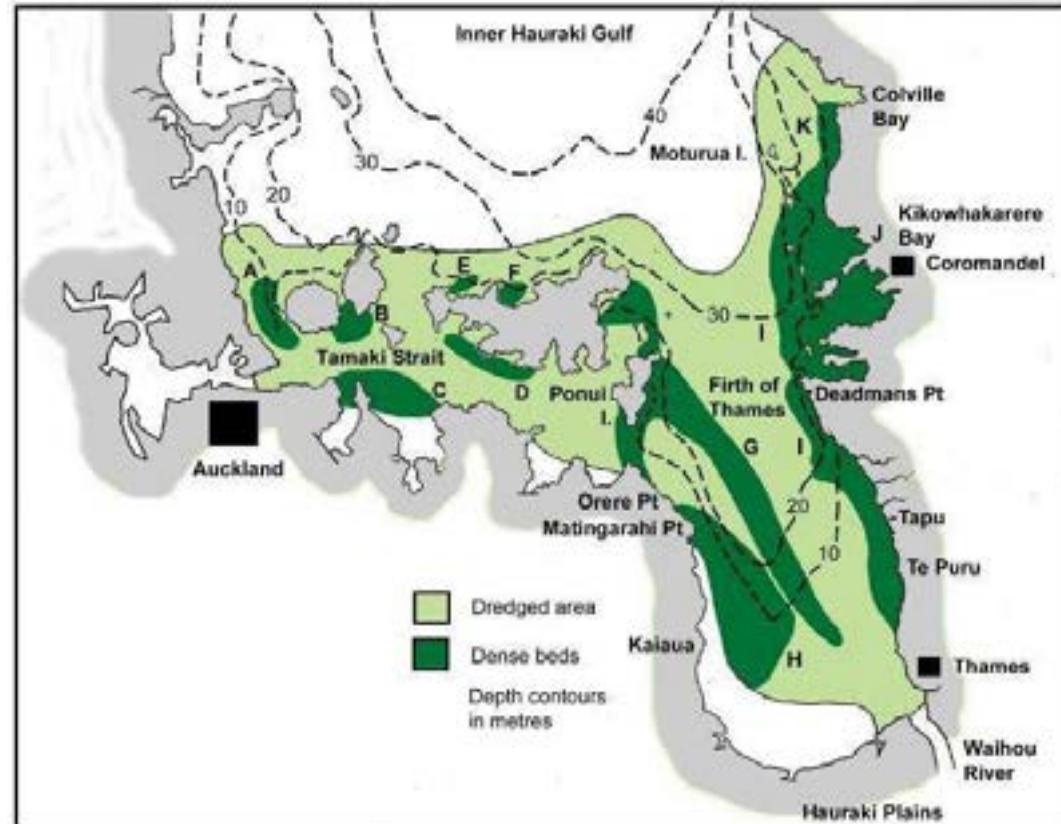


Kelp forest – Leigh Marine Reserve



Urchin flats – Leigh coast

1. Fishing



- Extinction of $> 500 \text{ km}^2$ of mussel beds
- Highest secondary productivity rates
- 10 times more fish
- Filtering Firth of Thames in one day
- Supported 200 – 16,000 tonnes of small predatory fish per year

Paul 2012

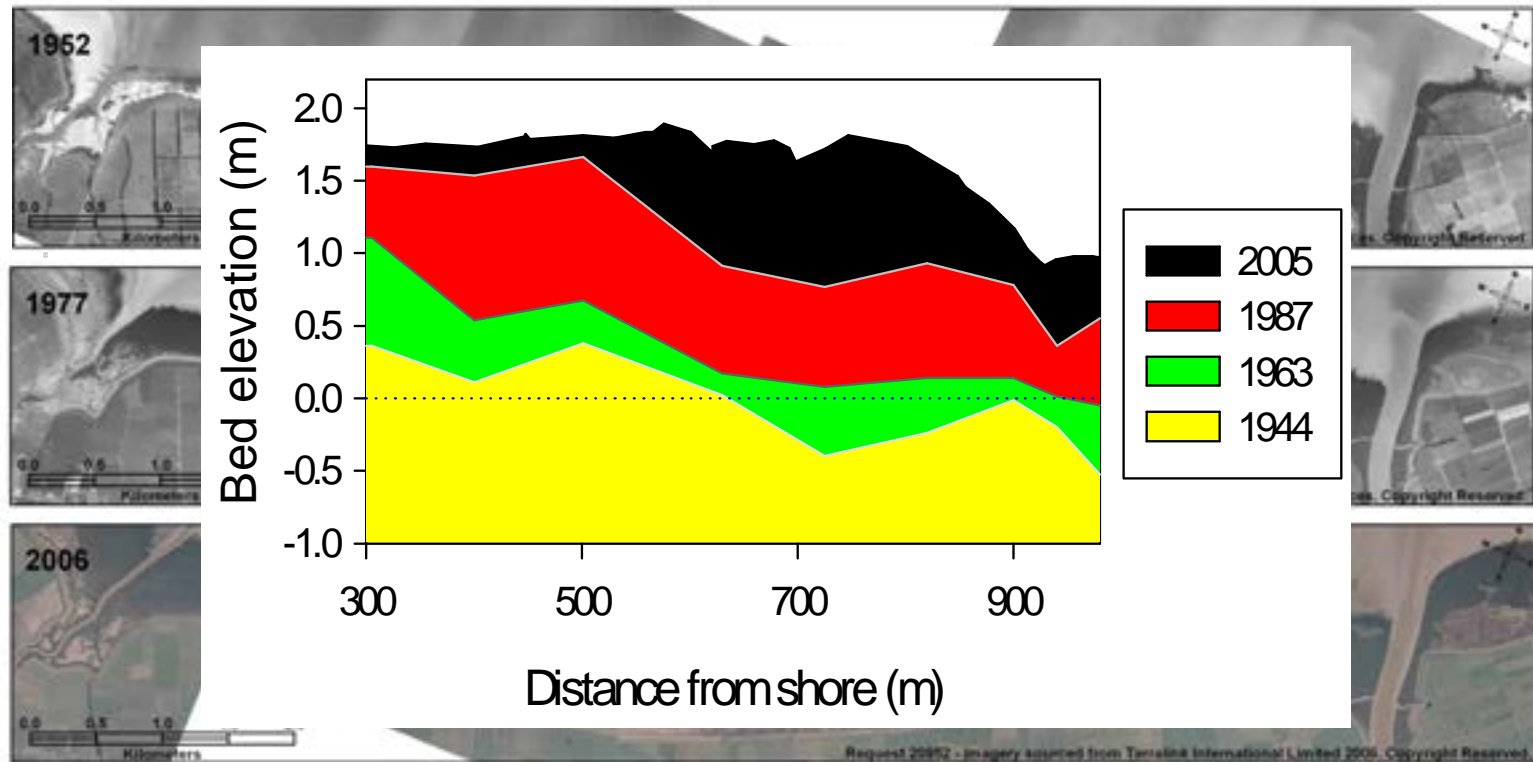


2. Sediment



- Largest wetland filter in NZ removed
- Deforestation
- Mining
- Urbanisation

2. Sediment



- Firth of Thames – 800 added to shoreline
- 1- 1.5 m of sediment added



2. Sediment



Photo: Floor Anthoni, Seafriends

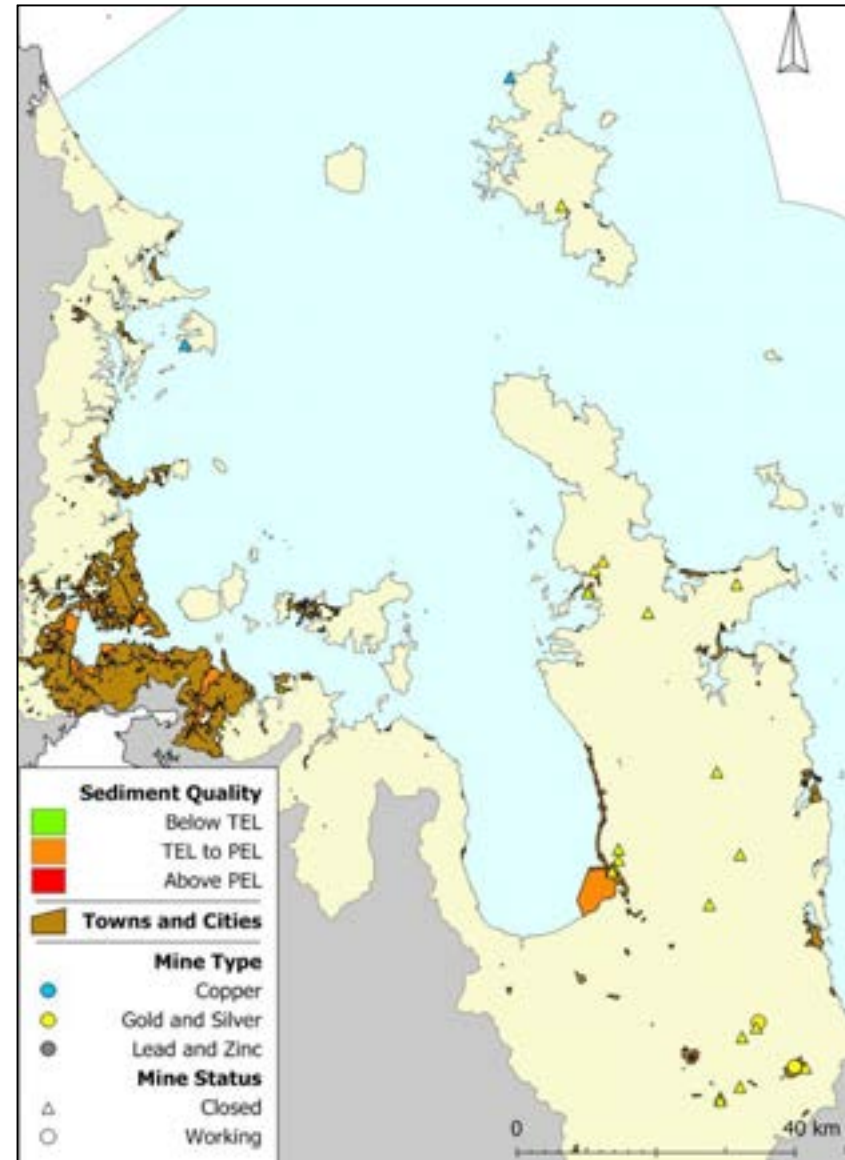


- Sediment clogs marine filter feeders
- Major problem for NZ 230M tonnes per year sediment into sea

3. Toxic pollutants



- TEL – Threshold Effect Levels
- PEL – Probable Effect Levels
- Copper, lead, mercury, zinc, organics



4. Nutrients

- ~ 90% of nutrients from Waikato region goes into Firth of Thames via Waihou and Piako Rivers
- Nitrogen loads increasing by 1%(Waihou) and 3.4% (Piako) per year
- Waihou River contributes in excess of 1,900 tonnes of nitrogen and 138 tonnes of phosphorus to the Firth of Thames each year



Photo: Writehererightnow

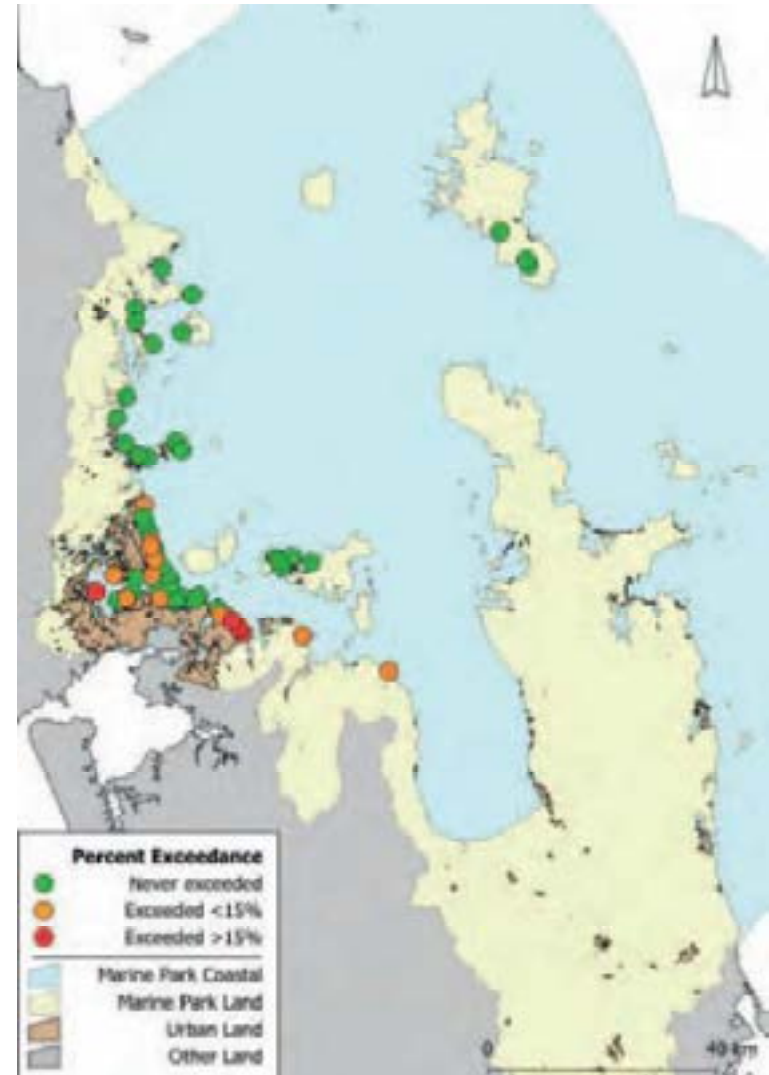
- Firth of Thames nutrient budget dominated by river inputs
- Minor contribution from Auckland rivers and nutrients stable or declining



5. Microbial pollution



- Bathing beaches
- Shellfish harvesting



6. Introduced marine species

- Now common throughout the Hauraki Gulf
- 139 species recorded in the Hauraki Gulf
- Four potentially serious species arrived in the Gulf in last 10 years
- Mediterranean fanworm *Sabella spallanzanii*
- Clubbed sea squirt *Styela clava*
- Asian kelp *Undaria pinnatifida*
- Japanese mud crab *Charybdis japonica*



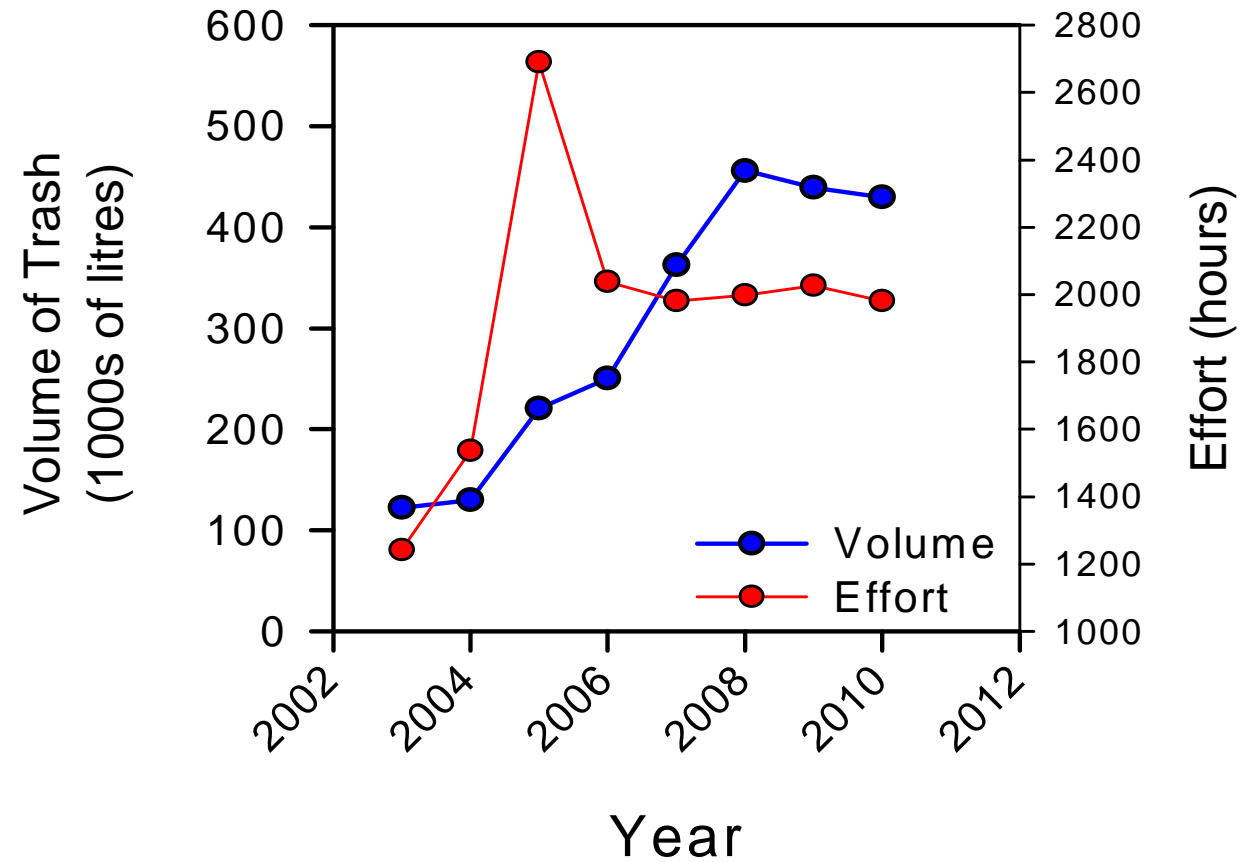
7. Noxious species

Year	Harmful algae or pathogen	Impact
1983	<i>Cerataulina pelagica</i> and <i>Prymnesium calathiferum</i>	Variety of marine life was killed through oxygen depletion and toxic effects.
1992-93	Unidentified virus?	Significant die-offs of the canopy forming kelp <i>Ecklonia radiata</i> in many parts of the Gulf.
1993	<i>Karenia concordia</i>	First reported cases of shellfish poisoning of humans in New Zealand. Mass mortalities of scallops in the Omaha Bay and Kawau area were also recorded but cause unknown.
1995	Herpesvirus	Largest mass mortality of fish (pilchards) ever recorded, both in terms of the number of fish and the geographic range affected.





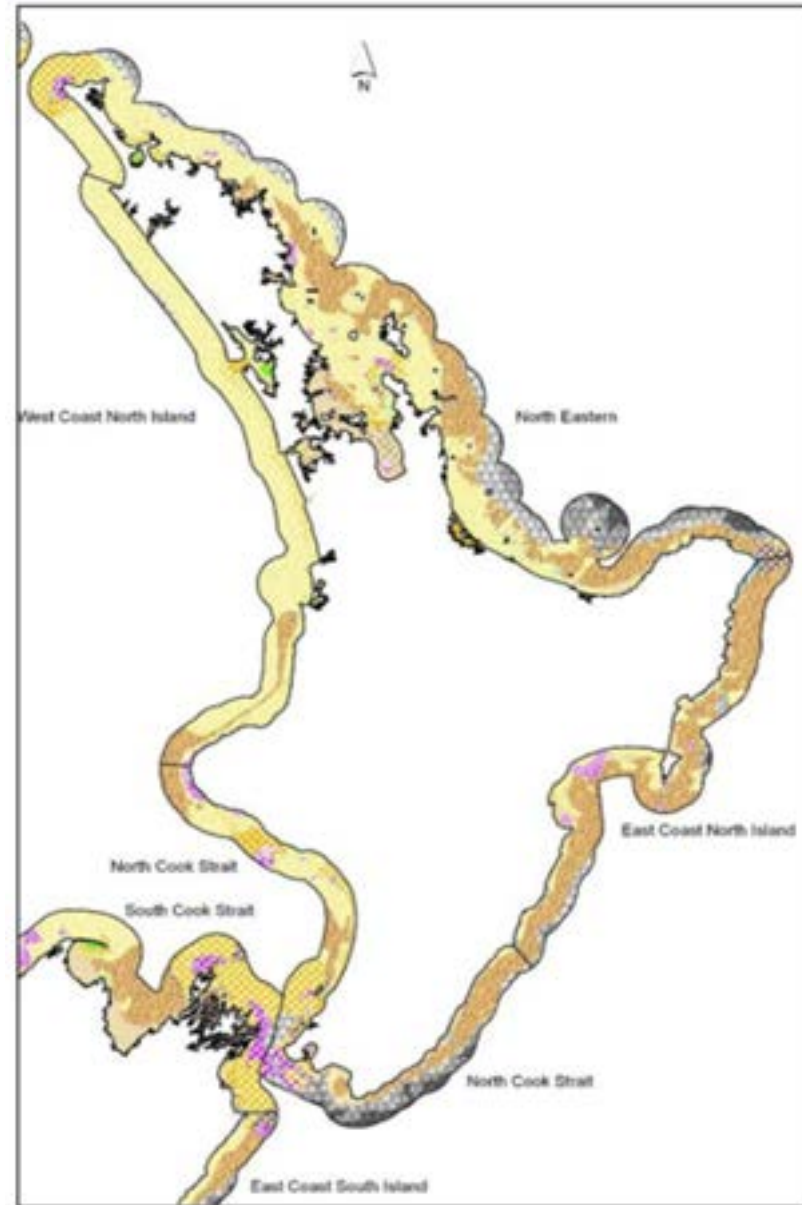
8. Litter



- Waitemata Harbour Clean Up Trust

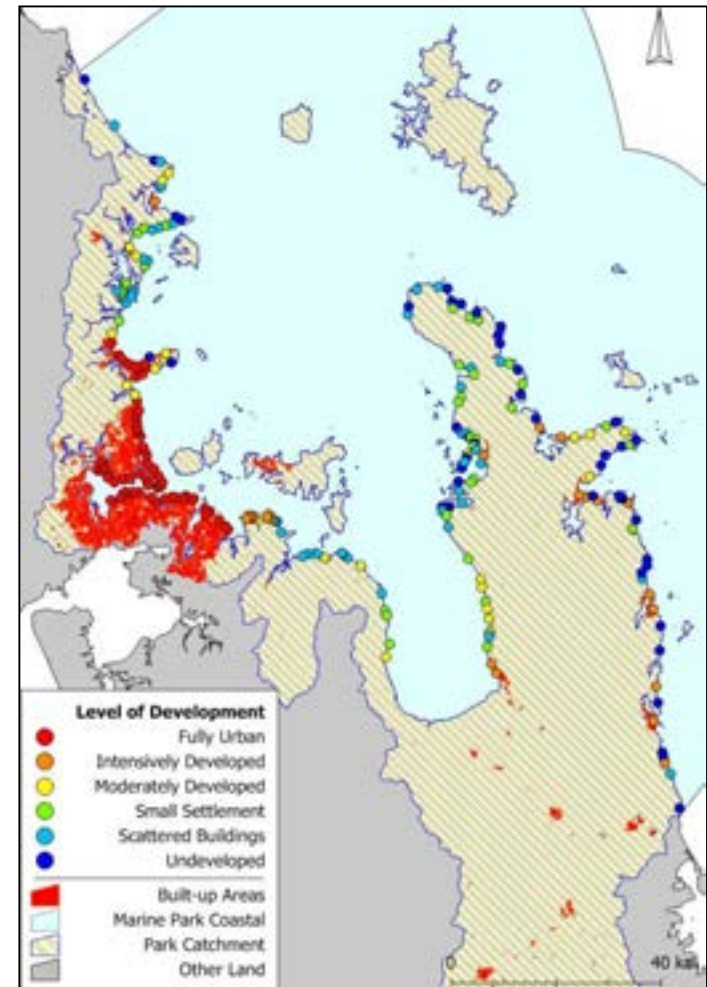
9. Protecting biodiversity

A third of the world's seabird species and a quarter of the world's cetacean species.



10. Coastal development

- 47 % bays and beaches fully urbanised, or intensively or moderately developed
- 38% undeveloped or contain scattered buildings
- 48% of dwellings unoccupied in Thames Coromandel District (2006 census)
- 20 camping areas were closed in the Auckland and Coromandel regions between 1996 and 2006



11. Others

- Vessel underwater noise
- Cumulative effects



Photo: PoAL



Marine Resource Issues for the Hauraki Gulf

What is important?

1. Fishing
2. Sediment
 - Scale?
3. Toxic pollutants
 - Permanent?
 - Risk?
4. Nutrients
 - Cost/Reward?
5. Microbial pollution
6. Introduced marine species
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