



CURRENT STATUS GREAT BARRIER REEF WORLD HERITAGE AREA – GLADSTONE REGION

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Government oversight of Gladstone dredging project

- No studies specifically relevant to assess impact of dredging
- No baseline studies of Aquatic Animal Health pre-dredging
- Inadequate monitoring of aquatic animal mortality (under-estimation of turtle deaths)
- Inadequate outbreak investigation of sick animals by untrained observers
- Evidence of sick and dying coral in front of Facing Island - no monitoring or investigation
- No assessment or monitoring of acoustic impacts
- Lack of independence in water quality monitoring
- All happening within World Heritage Area
- Clear evidence of a marine ecosystem health crisis



Gladstone Fishing Research Fund

- Funded FFVS outbreak investigation Jan 2012
- Multi-site, multi-species, multi-time point collections on commercial fishing vessels
- Will be compared to control site species at Stanage Bay
- Diagnostic tests: gross pathology; necropsy; histopathology; microbiology; algal identity; basic water quality



Sampling sites-Jan-Feb 2012





Evidence of sick animals

- Barramundi- not eating; red skin lesions; eye lesions; gill lesions; multi-species hyperparasitism
- Bull shark- skin lesions; hyperparasitism
- Catfish- red skin lesions ; emaciation
- Queenfish- red skin lesions (19/27); hyperparasitism
- Oyster crackers- fin erosions (3/3)
- Blubberlip bream- red skin lesions; eye lesions; hyperparasitism
- Black-tip/bronze whaler; hammerhead; weasel shark: high proportion reddened skin and skin ulcers
- Turtle- emaciated, with food in gut
- Dugong- boat strike lesions, with sea grass in gut
- Dolphin- increased mortality rate
- Crab- prevalence of shell disease increasing with proximity to dredging in western basin commencing May 2011 and worsening to the present
- Dying coral at Sable Chief Rocks, observed Feb 2012
- Dying coral trout when brought into harbour in April 1, 2011
- Sick humans- skin boils, fever, and skin rashes



Key history

- Dec 10-Jan 11: freshwater influx to harbour- turbidity not markedly elevated
- Apr 11- Sick fish reported at spoil dump ground red with high mucous excretion
- May 11: More sick fish begin being observed, with excessive mucous secretions and skin redness near dredge spoil dump ground
- Sick barramundi near hotwater outlet in Calliope
- June 11: Ulcerated crabs
- DERM Water quality monitoring detected increasing nitrogen (unrelated to rainfall); hugely increased turbidity (dredging being stopped for exceedance of 99th percentile on several occasions); elevated aluminium and copper
- Aug 11: Barramundi reported with heavy parasitic skin infections red eyes and catfish mortalities
- Sep-Oct 11: Toxic algal bloom reported
- Late Aug-Sept 11: >40 Fishermen develop skin lesions, most undiagnosed
- Jan-Feb 12 High percentages of diseased fish/crabs now February 2012 across entire area contacted by dredge spoil re-suspension
- Independent researcher develops skin rash after water contact
- Fish to south at Bundaberg and to north are normal



50%, n = 70 GLADSTONE HARBOUR - 16-17 FEBRUARY 2012
RUST SPOT DISEASE IN MUDCRABS (n = 418)





86% barramundi from 4 locations grossly diseased: abnormalities skin; gill; spleen; liver
~43 animals examined between 21/1/12 and 29/2/12 caught by gill net





4/4 bull sharks had ulcerative skin lesions with hyperparasitism, and red skin
One emaciated catfish and one with red extremities in Boyne R saline water 21/1/12



Ocean front Facing Island- Sable Chief Rocks: diseased blubbler lip bream; dead dying coral; eye lesions jewfish; shark skin ulcers and redness





Recent known dredging history to Oct 2011

- Oct 2010- Jan 2011: cutter suction dredge 343 426 m³ of material from adjacent to Curtis Island. Disposed of at the Fishermans Landing reclamation area.
- Jan 2011- Aug 2011: Bund wall construction
- Dec 2010: 30 000 m³ of material was removed from the RG Tanna coal terminal aggregate dock and disposed of to the RG Tanna mainland reclamation area.
- Feb 2011- Mar 2011: HMAS Brisbane dredging shipping channel disposed of at offshore disposal site – unknown quantity
- May 2011: Substantial dredging adjacent Curtis Island (GPC website, Observer)
- Aug 2011: 20 625 m³ removed from adjacent to Fishermen's Landing and disposed of to the east bank offshore disposal area
- Aug 2011-Oct 2011: backhoe dredge 595 000 m³ of material was removed from adjacent to Curtis Island and disposed of to the east bank offshore disposal area.
- Cutter suction dredge 395 000 m³ of material was removed from Gladstone Liquefied Natural Gas berth pocket and disposed to the Western Basin reclamation area.
- August 2011 to the present: 700 000 m³ of material is being removed from the material off-loading facility for Queensland Gas Corporation by bucket dredge Tavos and backhoe dredge Big Boss and disposed to the East Bank offshore disposal area.
- Note from May-2010 there were other dredging approvals in place for Fishermens Landing and Wiggins Island – it is not known whether or when further dredging happened
- No use of silt curtains to control plumes



Dredge Spoil dumping ground





Shell disease in crabs: rust spots; ulcers; gill hyperparasitism; deformity
Collected in Jan-Feb 2012 from Gladstone area estuaries





Diseased oyster crackers fin ulceration (3/3); black-tip shark skin ulcerations; barramundi with gill disease captured in 7 mile 29/2/12



Harbour trawl diseased banana prawn, eye lesions in soapy jew and ray



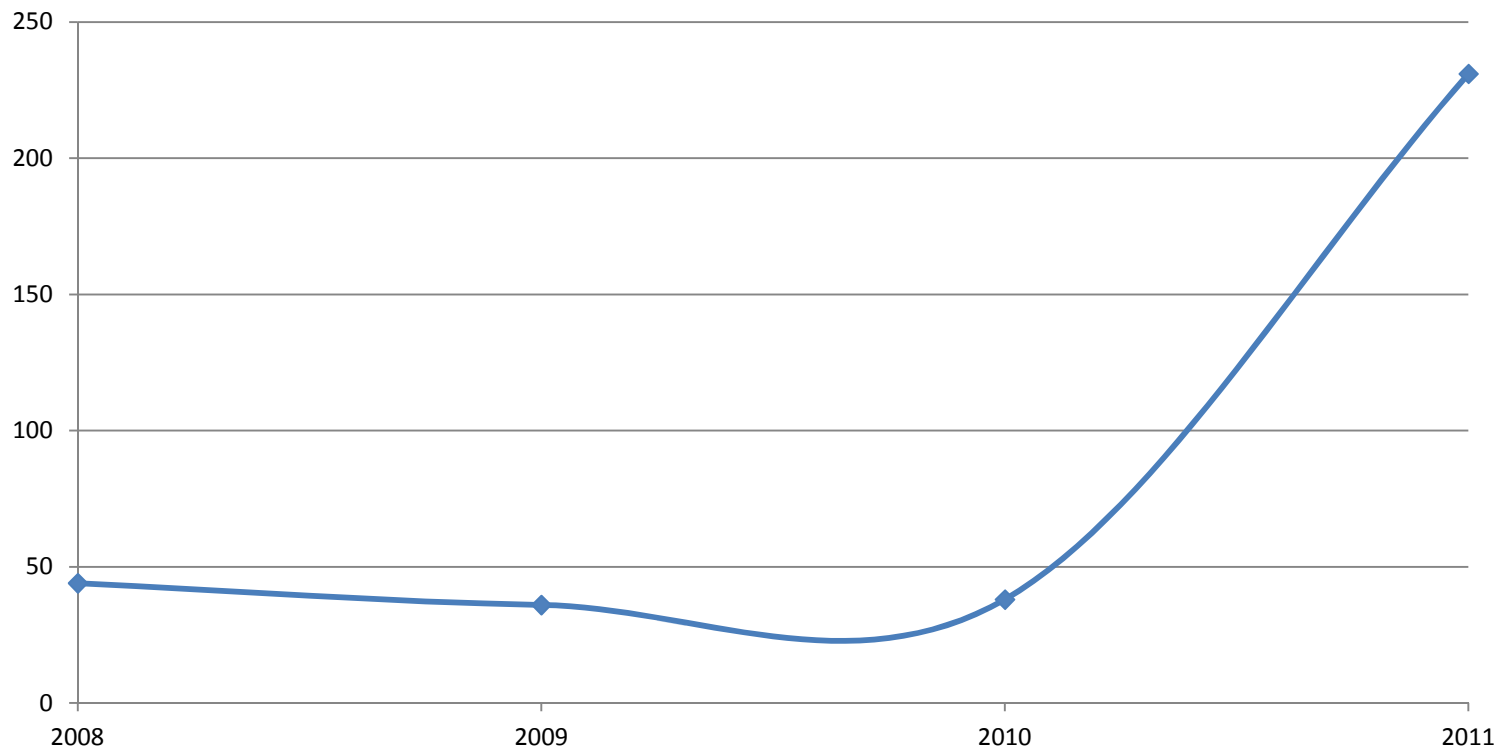


Sick Hawksbill turtle Jan 2011





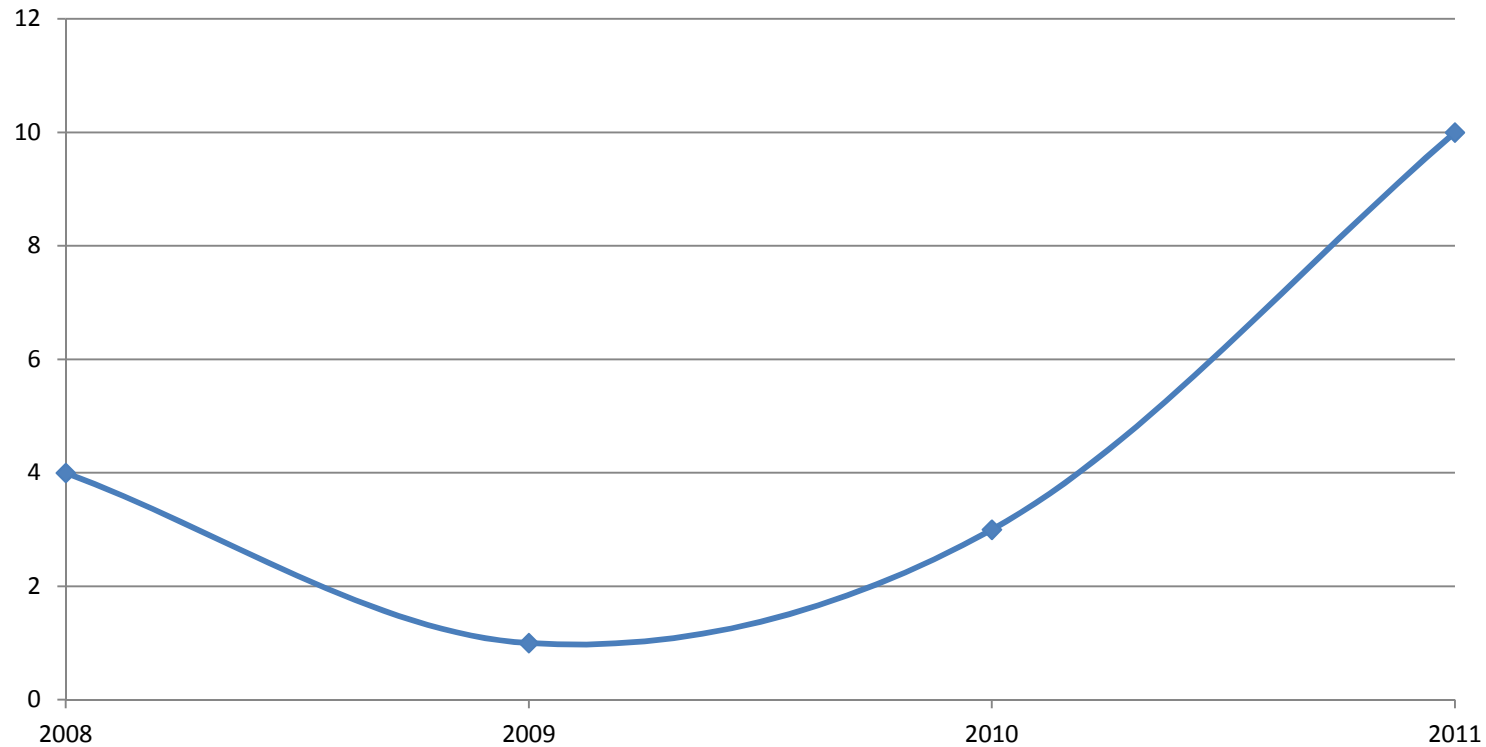
Turtle strandings 2008-Sept 2011



Gladstone Area Only
(40 between April and August 1, 2011)



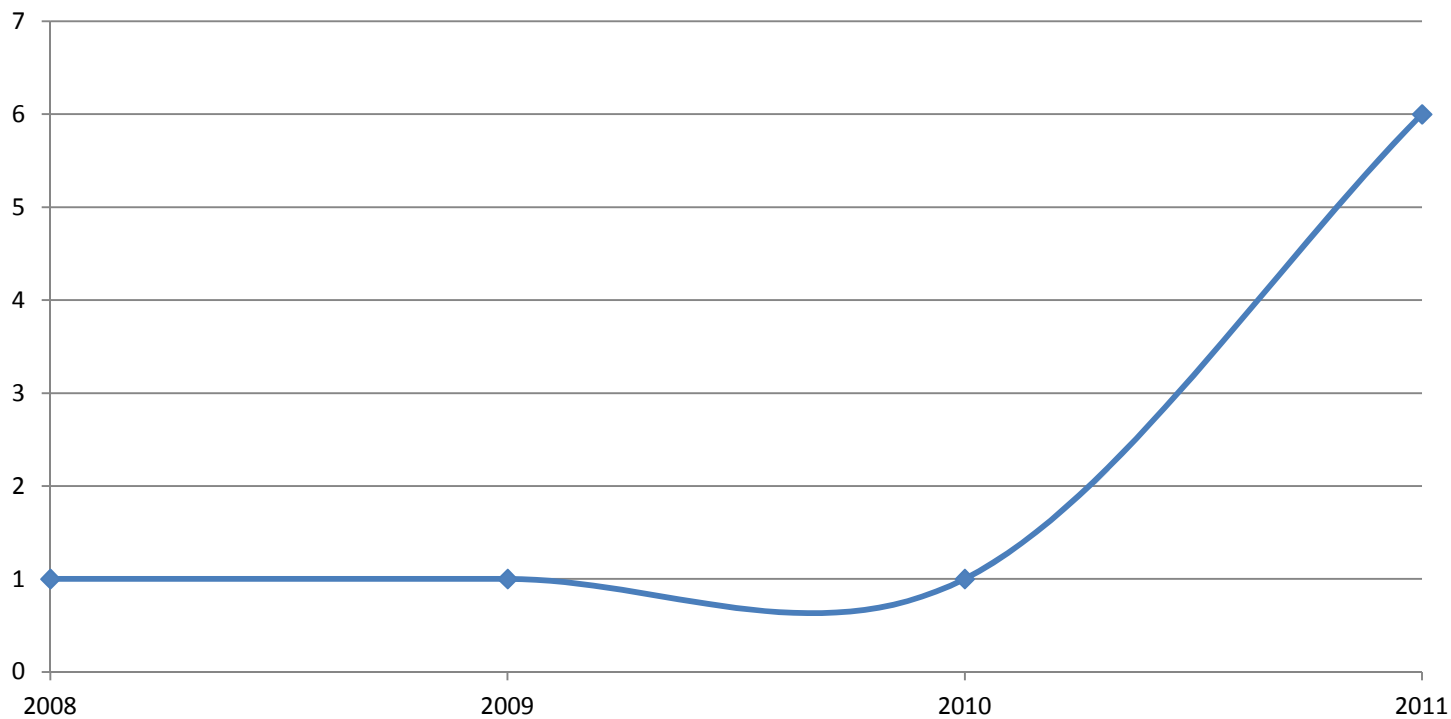
Dugong strandings 2008-Sept 2011



Gladstone Area Only
(4 from May to Aug 1)



Dolphin strandings 2008-Sept 2011



Gladstone Area Only (3 in May)



Likely stressors contributing to disease

- Increasing nitrogen associated with spoil re-suspension
- Toxic algal blooms (awaiting release of full reports)
- Prolonged elevation of suspended sediment
- Immunosuppression driven by increased exposure to a range of sediment borne pollutants including: metals and metalloids known to be present in high levels
- Hyperparasitism in immuno-compromised fish
- Bioaccumulation of heavy metals affecting mud crab shell metabolism
- Sound pollution- pile driving; ferry movements; dredges
- Acid Sulfate Soil- oxidation in water and air generating toxic compounds and increasing bioavailability of metals



Shell disease at 7 mile ~





Risk factors which cannot explain all observed signs

- Dec 10-Jan 11 influx of freshwater
 - Fish got sick in marine water only; and in ocean sites (spoil ground, sable chief)
- Influx of barramundi from dam to harbour
 - Many other non-barra species affected
- Cold water compromising immunity
 - Disease ongoing in now extended summer temperatures
- Bloom of neobenedenia skin parasites
 - Multiple parasites on multiple fish species
- Lack of seagrass caused turtle starvation
 - Seagrass was in dugong stomachs; other food was in turtle stomach
- Fishing nets were responsible for turtle death spike
 - Govt Observers on vessel observed only one captured turtle released alive
 - Turtles were emaciated when found washed up; in areas where there had not been active netting (front of facing island)



Risk factor which can explain the presentation of all the observed signs in all of the locations, at all time points

- Re-suspension of dredge spoil from dredging and ocean spoil dumping



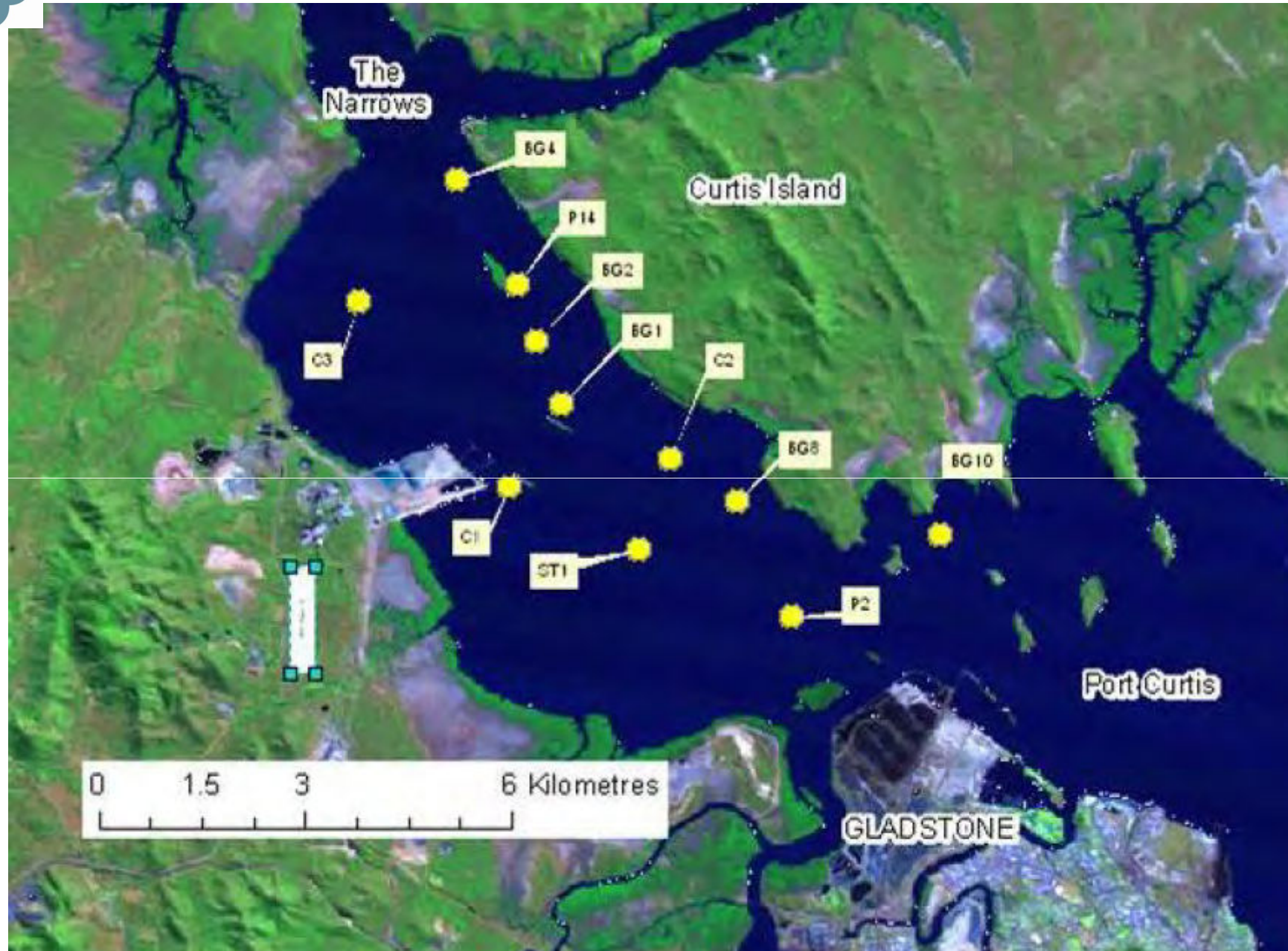
Turtles- not starving to death

- “In looking at all the photographs it was noted that some of the animals were losing condition and showed signs of low body fat and 'black fat'. The food being eaten by many of the turtles was unusual and included some animals having a stomach full of the fruit and leaves of the Grey mangrove, which is usually eaten in small volumes but not exclusively when seagrass is available.” DERM report
- Dolphins dying at same time (not seagrass eaters)
- Dugongs dying at same time with seagrass in gut



Water quality monitoring- systematic under-protection

- Monitoring trigger value levels being used for slightly to moderately modified waterways
- To only ensure ~95% of species do not experience an adverse effect
- As area is WH listed- why are the ~99% trigger value levels not being used

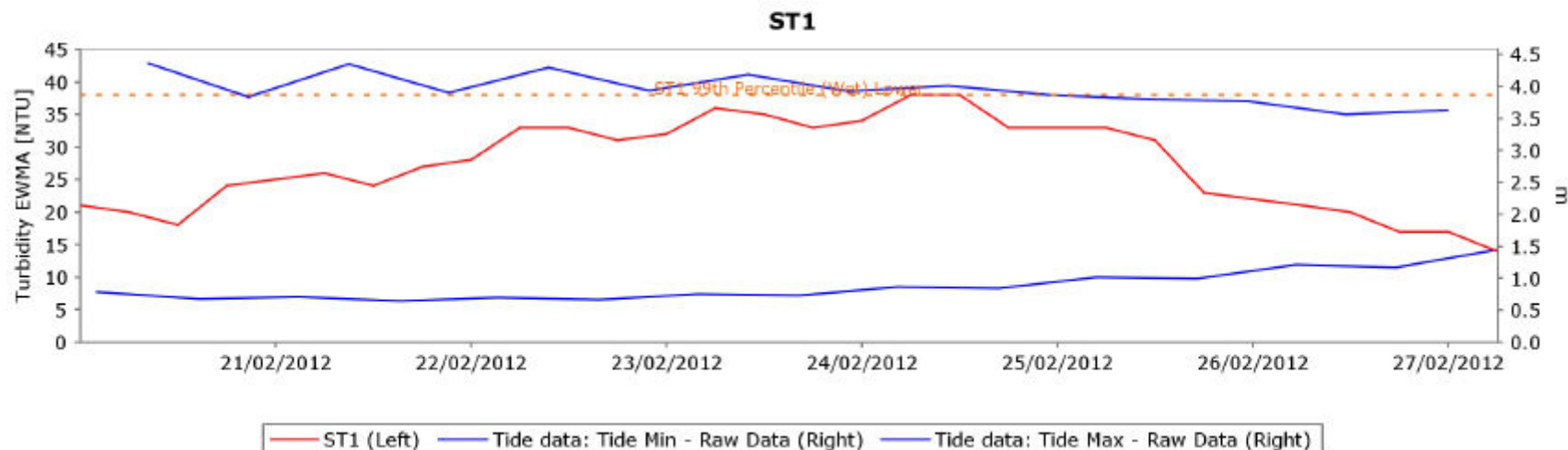




Turbidity

- EIS stated baseline, median turbidity levels in the harbour were 3.9 NTU in the dry and peaks of 10-23 NTU in the wet.
- The data shows the current mean turbidity levels are between 20 and 40 NTU the entire time, which is 10 times the background level for dry season, and 2 to 4 times the background level for peak wet season turbidity.
- Typical ANZECC default 95% protection trigger value for tropical estuary and marine is 1 to 20NTU
- Our independent testing found numerous high level exceedances throughout the Gladstone harbour and tributaries.
- LNG project trigger value 40NTU

Western Basin Dredging and Disposal Project Weekly Water Quality Monitoring Data





Auckland Creek



28 September 2011

Graham's Creek



27 September 2011



Gladstone Harbour Jan 2004



Gladstone Harbour Jul 2011





Gladstone Harbour Jul 2011





Boom goes the reef

How Australia's coal export boom is driving reckless industrialisation of the Great Barrier Reef World Heritage Area.



Capacity for coal exports by 2020:

944 million tonnes

That's enough to fill a coal train and wrap it 4½ times around the world.

Coal throughput in 2011:

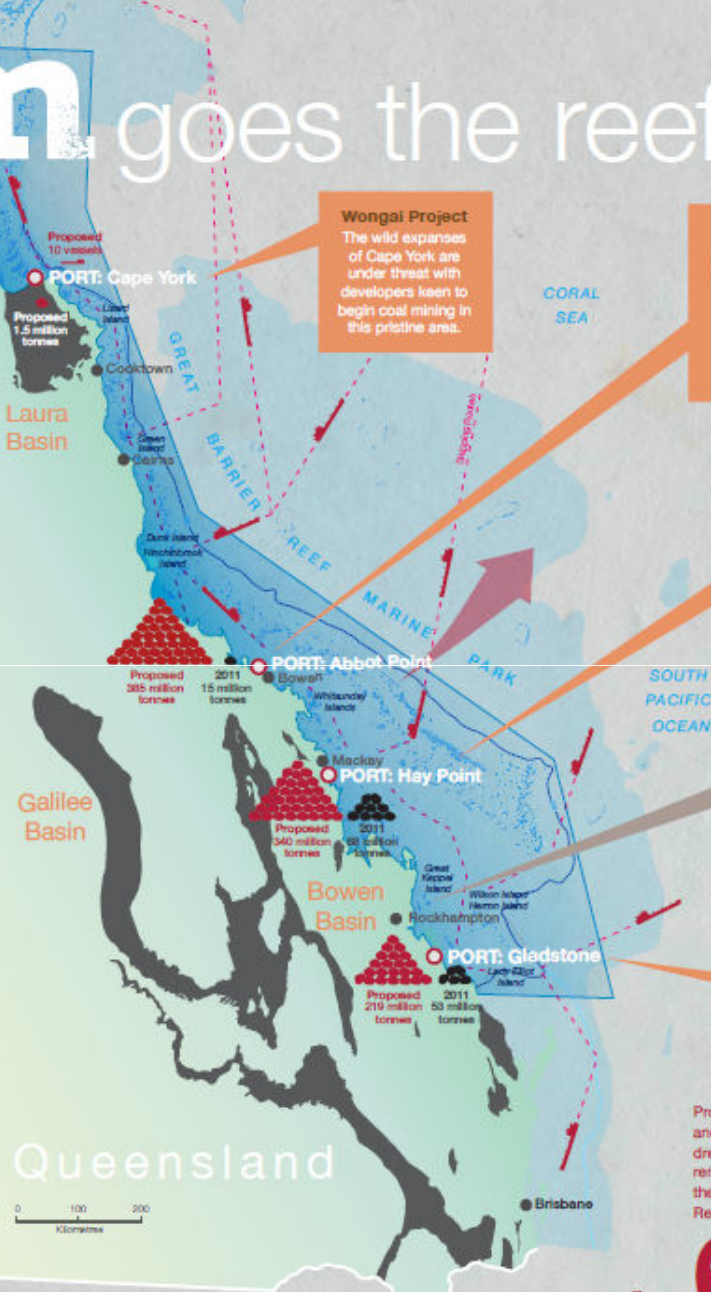
156 million tonnes

Galilee Basin

Australia is on the verge of an unprecedented coal boom. The epicentre of this expansion is the yet to be developed Galilee Basin in Central Queensland. Owned by a handful of mining magnates such as Clive Palmer and foreign conglomerates such as GVK and Adani, Galilee is the proposed site for a series of mega mines that will cause Australia's coal exports to more than double within a decade. The creation of mega mines in Central Queensland, the accompanying export infrastructure and increases in shipping traffic, as well as the burning of the coal they produce, place an incredible burden on Australia's Great Barrier Reef.

Queensland

0 100 200
Kilometres



Wongai Project
The wild expanses of Cape York are under threat with developers keen to begin coal mining in this pristine area.

Abbot Point
Abbot Point is set to eclipse all other ports to become the world's largest coal export terminal. The result? Over 20 ships per day passing the Whitsunday Islands.

Hay Point
Hay Point is already one of the world's biggest coal export ports. Planned expansions will more than double capacity from the area.

Shen Neng 1
Grounded for nine days, in 2010 the Shen Neng 1 destroyed around 290,000 m² of reef. Since 1985, an average of two major shipping incidents have occurred every year.

Gladstone
As well as LNG terminals three new coal ports are planned for the Gladstone area, almost tripling capacity and destroying dolphin and dugong habitat in the process.

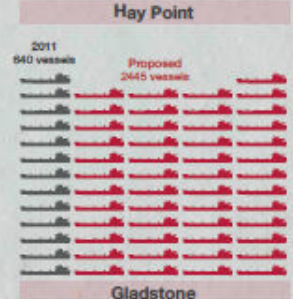
Proposed and approved dredged material removed from the Great Barrier Reef would fill

67 MCGs

 or 113,184,000 m³ (Melbourne Cricket Ground)

Number of coal ships in 2011:
1,722

Number of coal ships by 2020:
10,150
(more than one per hour all year)



KEY
80 vessels = [red bar]
1 million tonnes of coal = [red dot]