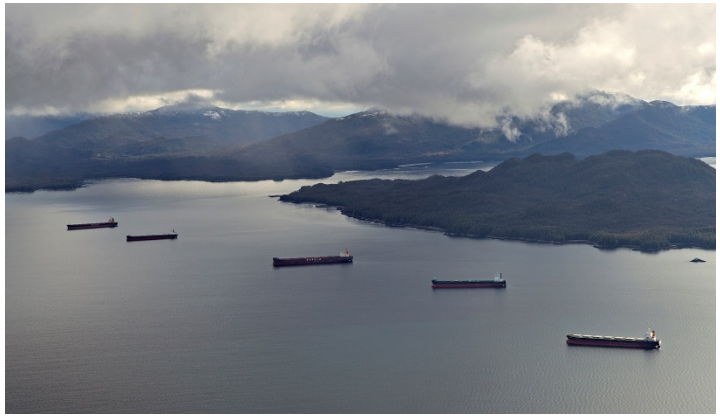
PORT OF
PRINCE RUPERT

Stewardship and Sustainability at the Port of Prince Rupert

Jason Scherr, Manager Environmental Sustainability
Green Shipping Workshop
Joint Public Advisory Committee
December 12, 2016

Environmental Initiatives

- Completion of an environmental footprint study to understand baseline of air quality, water quality, noise
- Development of a Environmental Sustainability Plan
- Establishment of Port Environmental Stewardship Committee
  - Port tenants and users
  - Proponents
  - First Nations
  - Government agencies
  - Academics
  - NGOs
- Development of programs and action plans:
  - Air quality
  - Water quality
  - Habitat Stewardship
  - Marine Mammals



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Air Quality Program

Understand baseline, establish long-tem monitoring and implement measures to manage and mitigate impacts

- Energy and Emission Inventory
- Meteorological stations
- Dispersion modeling
- Wet deposition station
- Air quality and dust monitoring
- Clean Trucking Program
- Shore Power
- Green Wave Program

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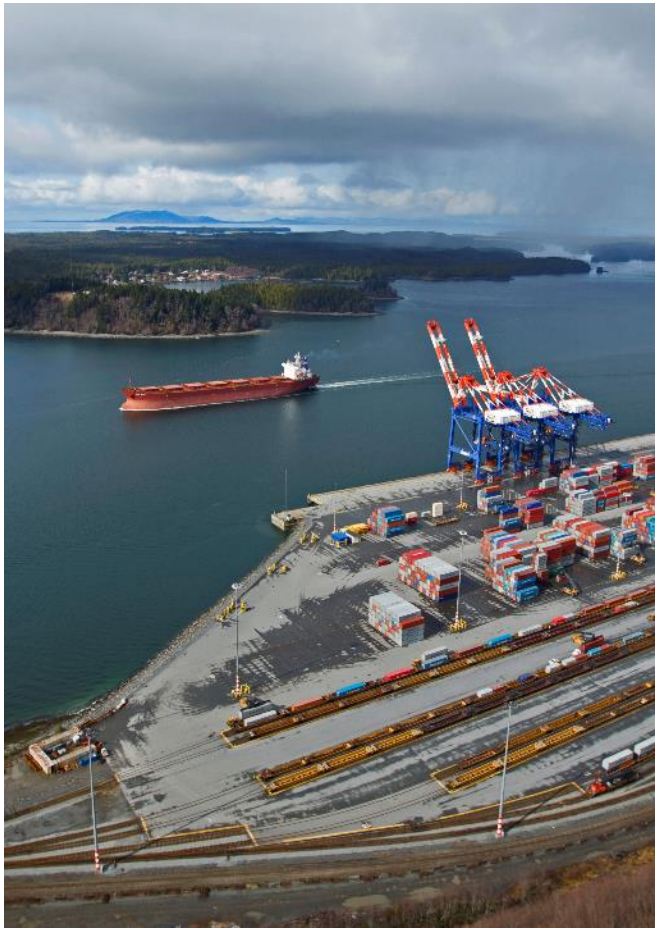
Energy and Emission Inventory

- Annual inventory includes all port tenants and users
- Includes land and water side components
- Use of the Port Emission Inventory Tool (PEIT) developed by Transport Canada
- Five source groups are:
  - Marine
  - Cargo Handling Equipment
  - Rail
  - On-Road Vehicles
  - Administration
- Marine vessels account for largest component of port emissions
- Reductions of SOx and PM2.5 due to implementation of NA ECA



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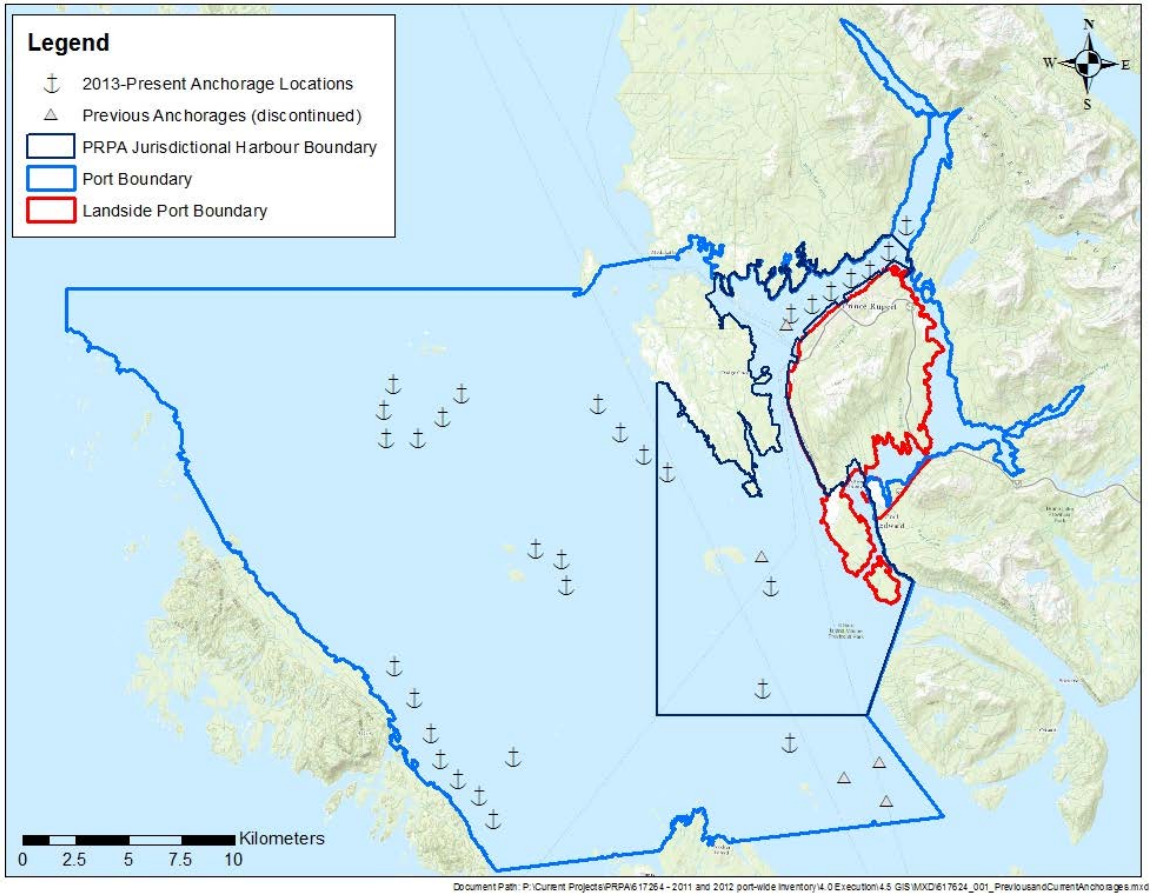
Energy and Emission Inventory

- Landside Boundary includes all landside activities plus vessels at berth.
- Port Boundary includes all port anchorages and extends to pilot station at Triple Island. Also includes rail and road off of immediate terminal boundaries.



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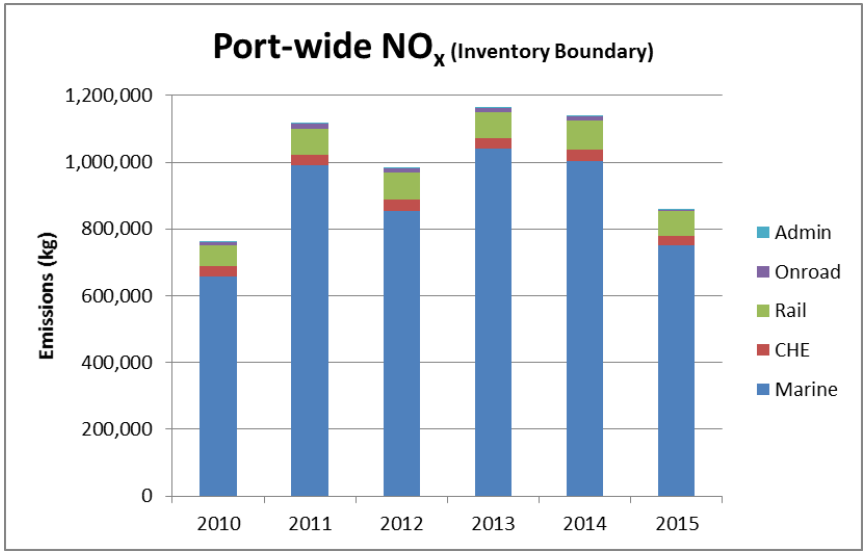
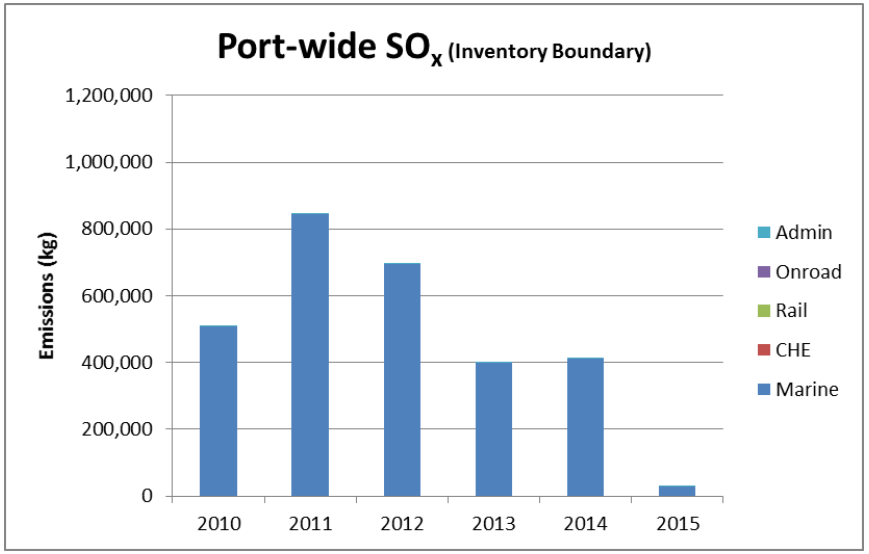
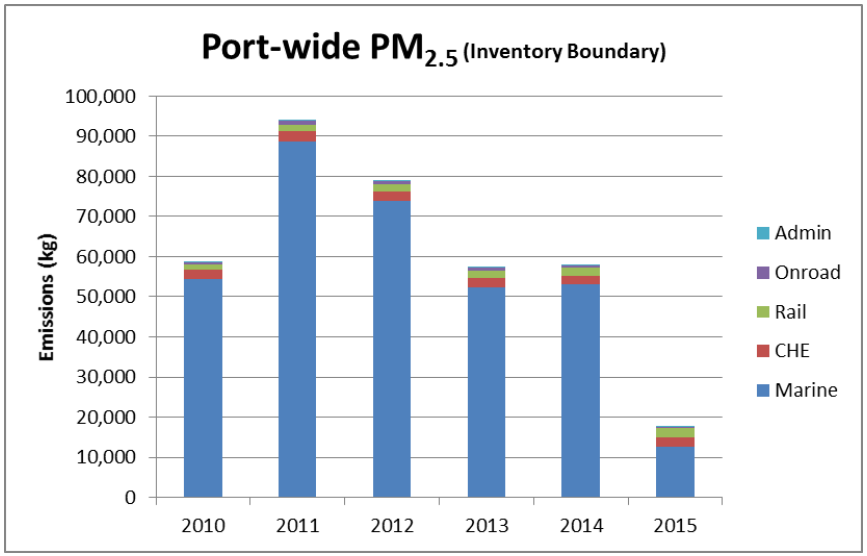
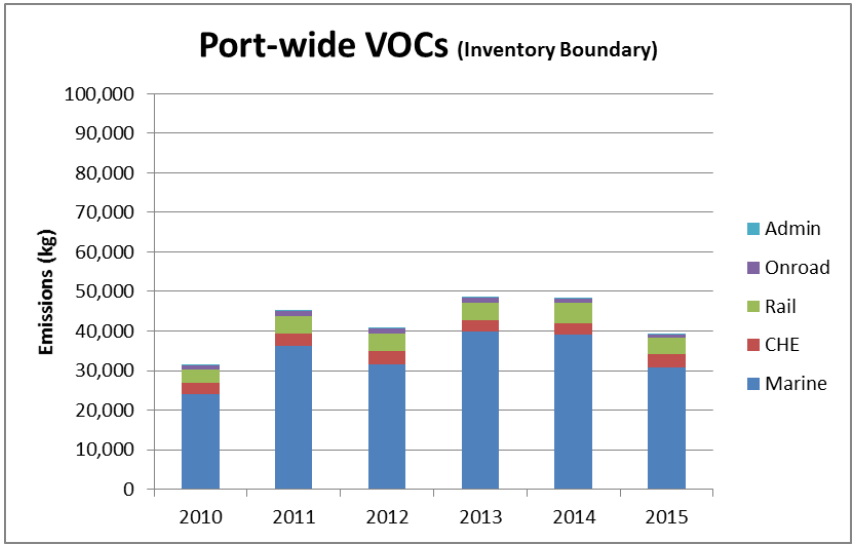
Emission Inventory Data









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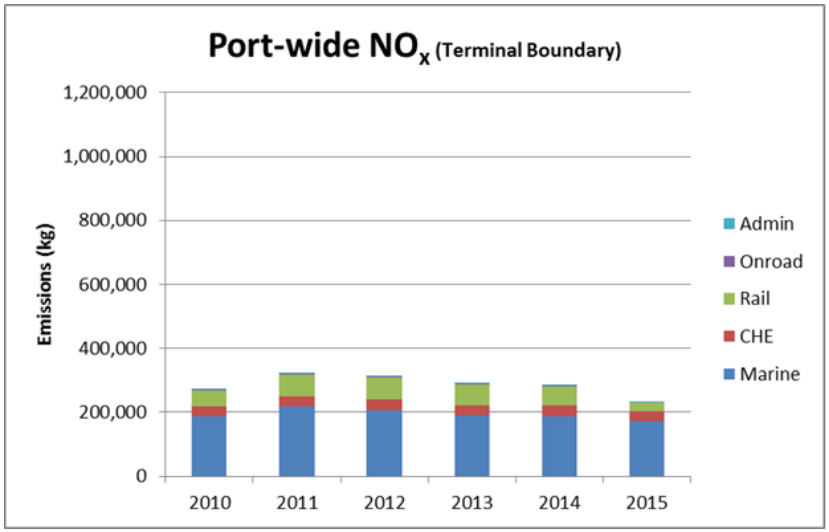
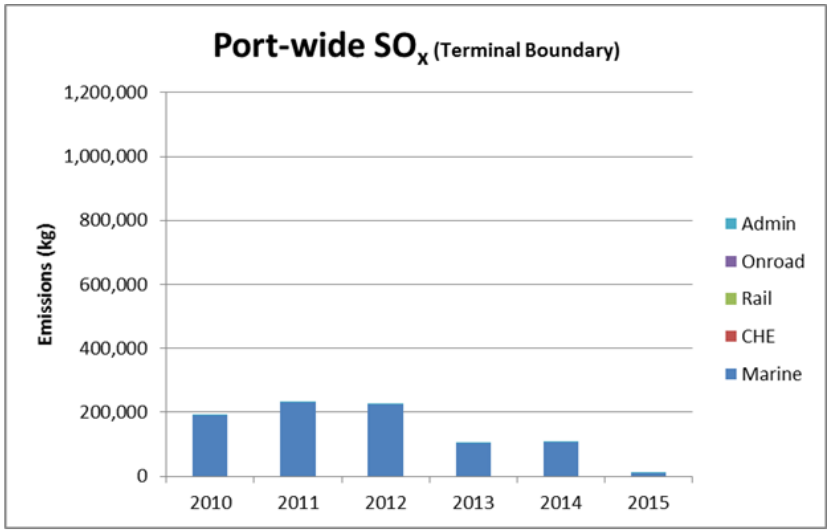
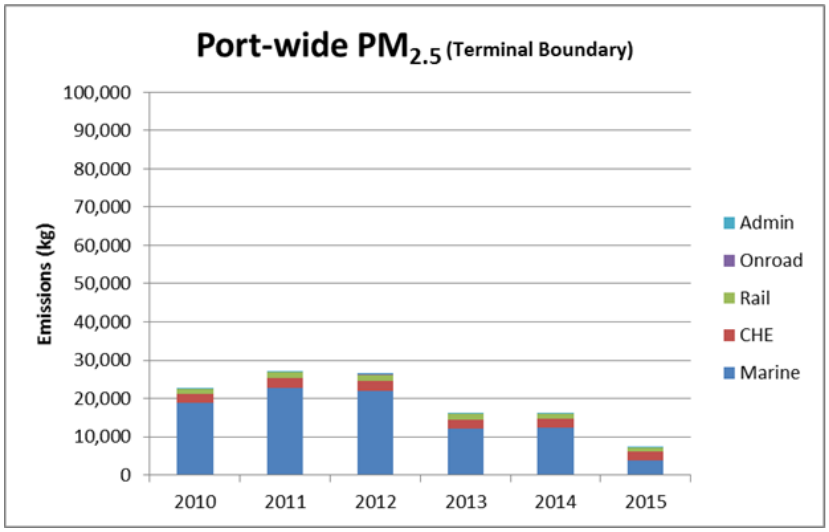
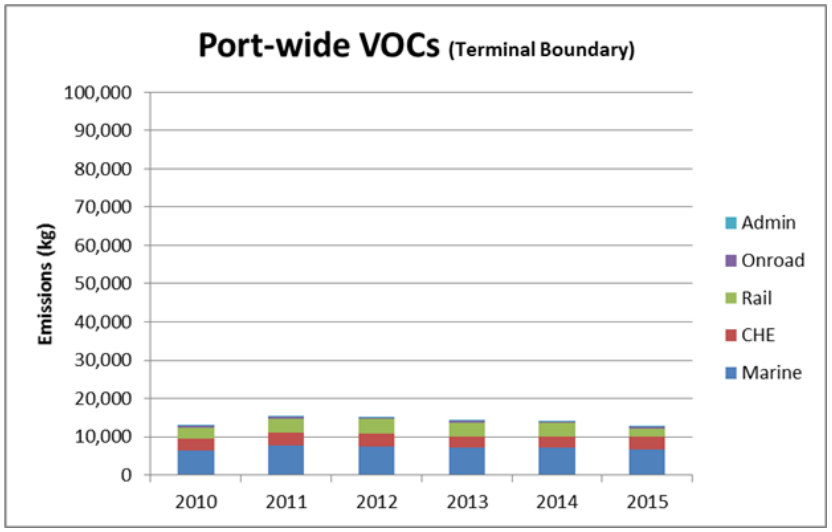
Emission Inventory Data









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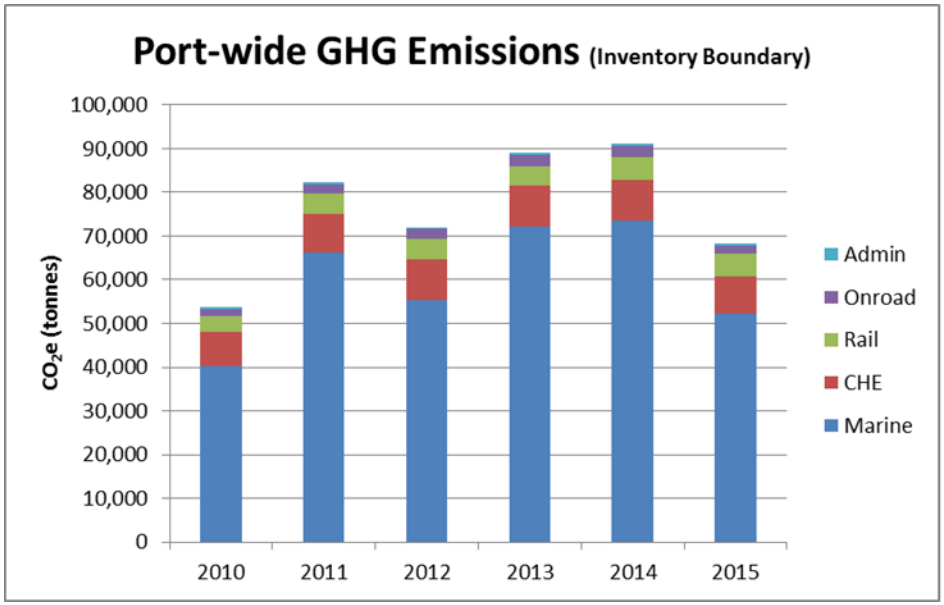
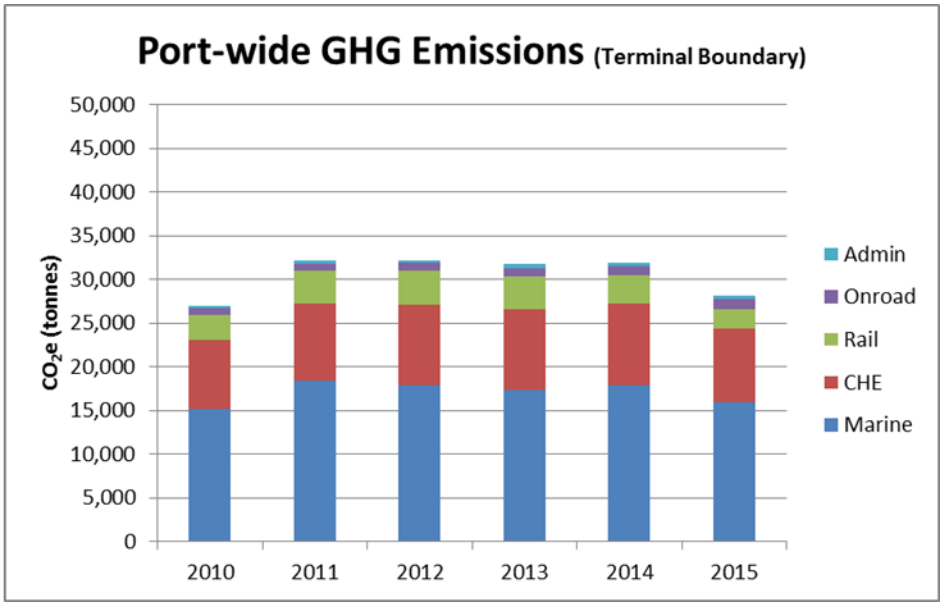
Emission Inventory Data





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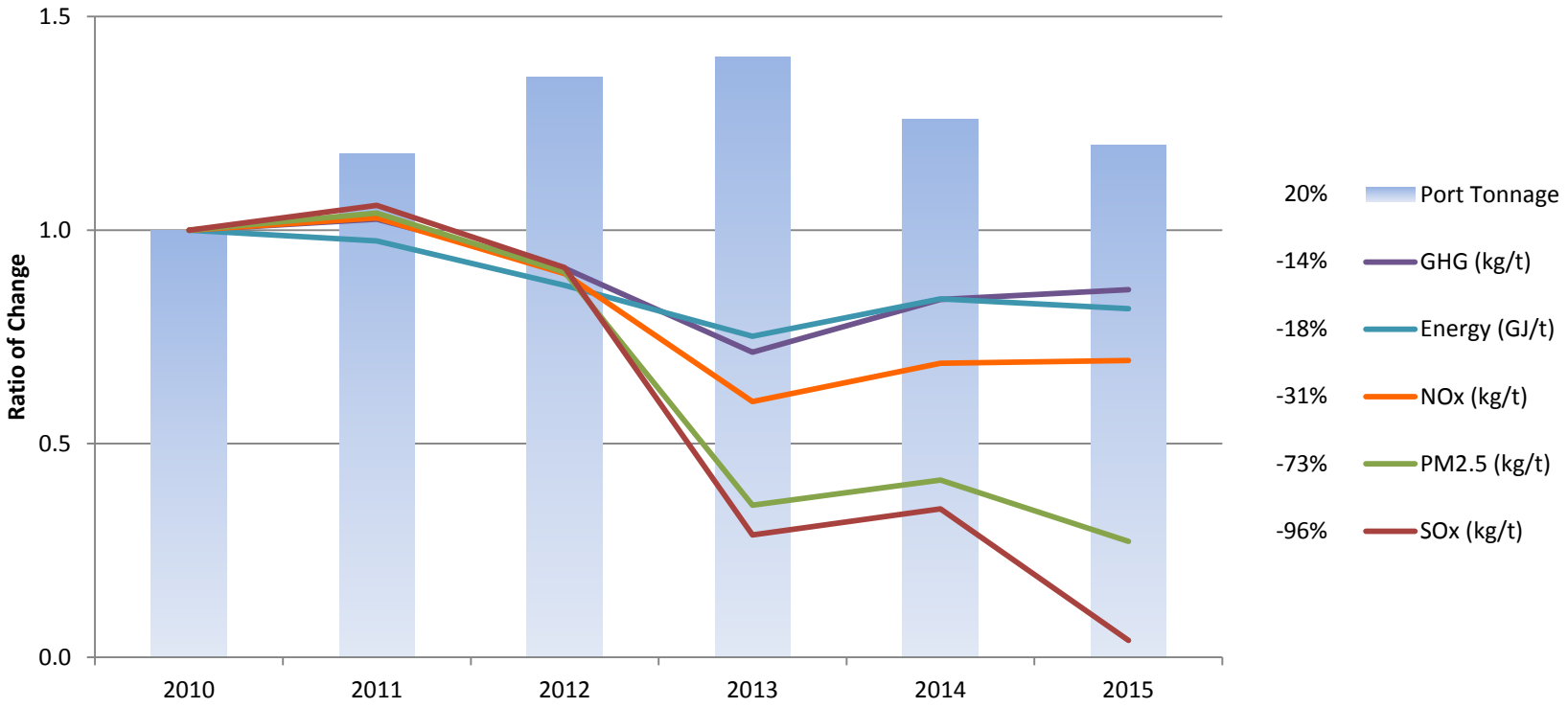
Normalized Energy/Emissions
Relative to 2010 (Terminal Boundary)

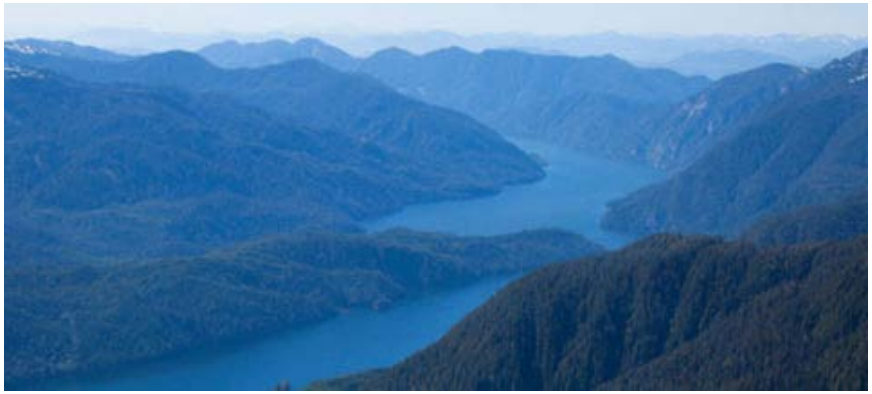


Carbon Neutral

Prince Rupert Port Authority carbon neutral since 2015.

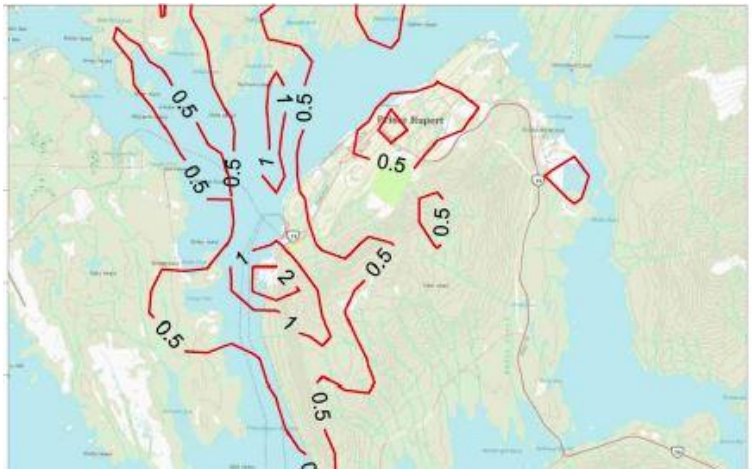
- 422 tonnes CO2 offset in 2015

  - Great Bear Rainforest Project
  - Quadra Island Forestland Conservation Project



Meteorological Stations / Dispersion Modeling

- Establishment of a series of meteorological stations around the port region
- Assists with safe navigation
- Data also used to understand dispersion of port related emissions
- Conducted dispersion modeling using port emissions and regional meteorological data
- Assists in understanding regional air shed and air quality issues
- Prince Rupert Air Shed Study – conducted by Province of BC



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Wet Deposition Program

- Station established Jan 2014
- Part of the National Atmospheric Deposition Program
- Co-funded by four LNG proponents
- Chemical analysis of precipitation
- Provides long-term air quality baseline
- Data used to assess potential impacts from current activity and future port development

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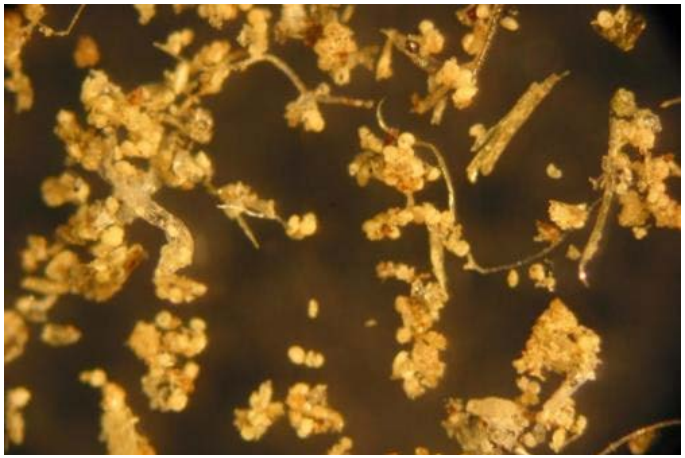
Air Quality / Dust Monitoring

- Air quality monitoring around the port
- Baseline data collection prior to port development
- Real time monitoring technology being deployed around the port
  - SOx
  - NOx
  - PM
  - VOCs
- Prince Rupert air quality station established Dec 2016
- Dust fall being monitored in select port locations
- Use microscopic analysis for dust



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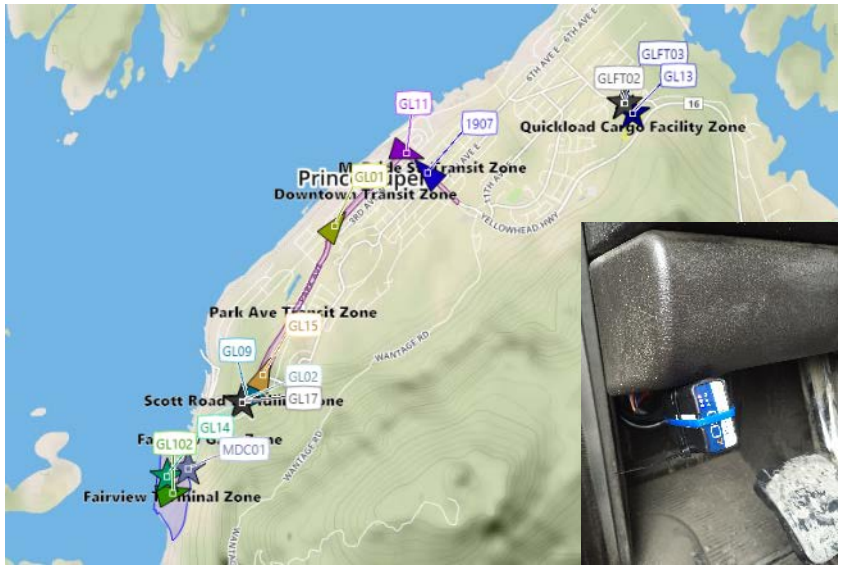
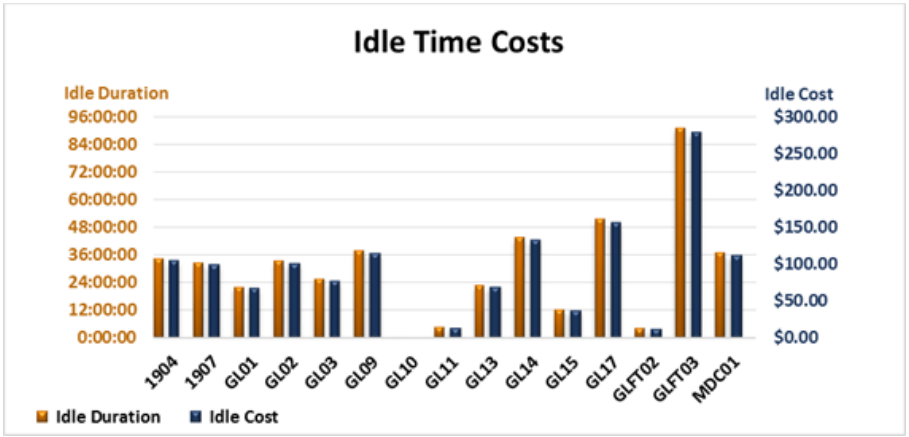
Clean Truck Program

- Program to reduce emissions from trucking fleets
- Working with trucking company to use tracking technology
- Monitors cargo fluidity and driver behavior
- Reduction of activities such as idling reduces emissions
- Reduction of fuel use saves trucking company money





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Energy

Reduction of energy use with implementation of technology and improved design

- LED lighting in port offices and Port Interpretive Center
- LED roadway lighting for RRUC
- RRUC lighting activated with use
- New water pump house with a 90% reduction of energy

PORT OF PRINCE RUPERT
LINKING A WORLD OF OPPORTUNITY

Shorepower

- Fairview Terminal first Canadian container terminal to commission shore power
- Commissioning was Oct 2014
- Shore power rate for the Province of BC established May 2015
- Shore power rate was a collaboration between Port of Prince Rupert, Port of Vancouver and BC Hydro
- Shore power rate will encourage implementation of technology
- Shore power at Fairview Terminal will become operational after completion of terminal expansion in 2017

Green Wave Program

- Established 2013
- Targets marine component of port emissions

- Reduced harbour dues for vessels that have implemented emission reduction measures and/or other environmental practices to improve environmental performance

- Vessels qualify based on performance within one of the following organizations/initiatives:
    - Green Marine
    - RightShip
    - Environmental Ship Index
    - Green Award
    - Clean Shipping Index
    - Energy Efficiency Design Index

- 2015 - 133 vessels qualified, $140K in discounts
- 2016 - 164 vessels qualified, $279K in discounts

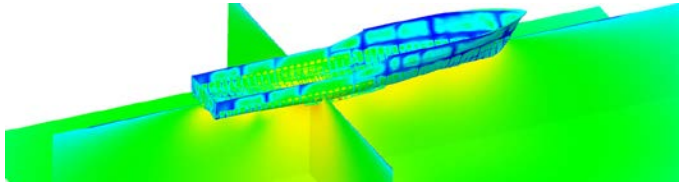
Green Wave Program

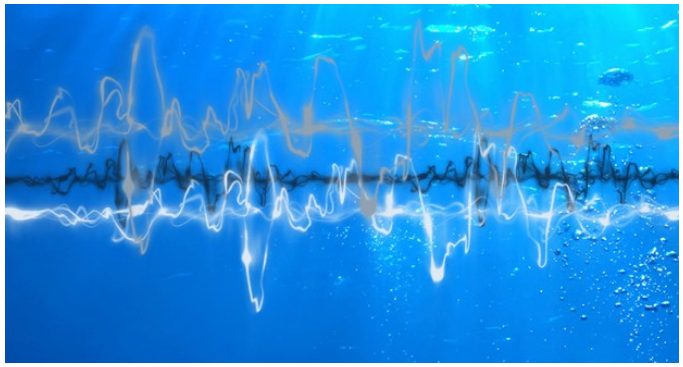
- Added underwater noise criteria Jan 1, 2017
- One of two ports in the world to offer incentive discounts based on noise
- Discounts based on notations from ship classification societies

  Det Norske Veritas - Germanischer Lloyd (DNV-GL)
    - SILENT notation OR Certificate of Compliance

  Bureau Veritas (BV)
    - URN notation

  Registro Italiano Navale (RINA)
    - DOLPHIN notation





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LINKING A WORLD OF OPPORTUNITY

2017 Green Wave Criteria

GENERAL	SPECIFIC	TIER 1 (10%)	TIER 2 (20%)	TIER 3 (50%)
ENVIRONMENTAL PROGRAM	Environmental Ship Index (ESI)	Scores 20-30	Scores >30 - 50	Scores >50
	Green Marine	Level 3 GHG and min Level 2 overall	Level 4 GHG and min Level 2 overall	Level 5 GHG and min Level 2 overall
	RightShip	GHG B OR Env 4 Stars and GHG D OR GHG C and Env 3 Stars	GHG B and Env 3 Stars	GHG A
	Energy Efficiency Design Index	EEDI 15% better than required	EEDI 25% better than required	
	Green Award	Award certificate		
	Clean Shipping Index	Score of Yellow	Score of Green	
UNDERWATER NOISE	Det Norske Veritas - Germanischer Lloyd (DNV-GL)			SILENT notation OR Certificate of Compliance
	Bureau Veritas (BV)			URN notation
	Registro Italiano Navale (RINA)			DOLPHIN notation

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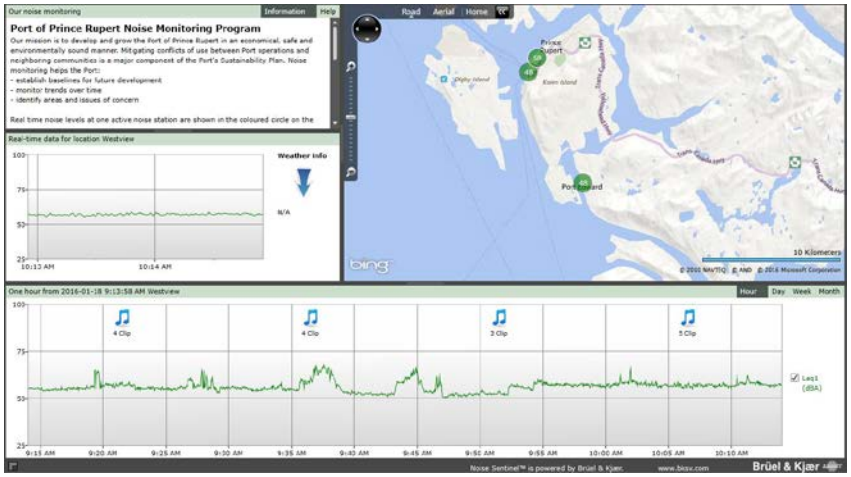
Noise Monitoring Network

A series of stations providing live data on noise levels.

- Fairview
- Westview
- Seal Cove
- Port Edward

Data is available through a public portal.

https://sentinel.bksv.com/ppr/rupertport



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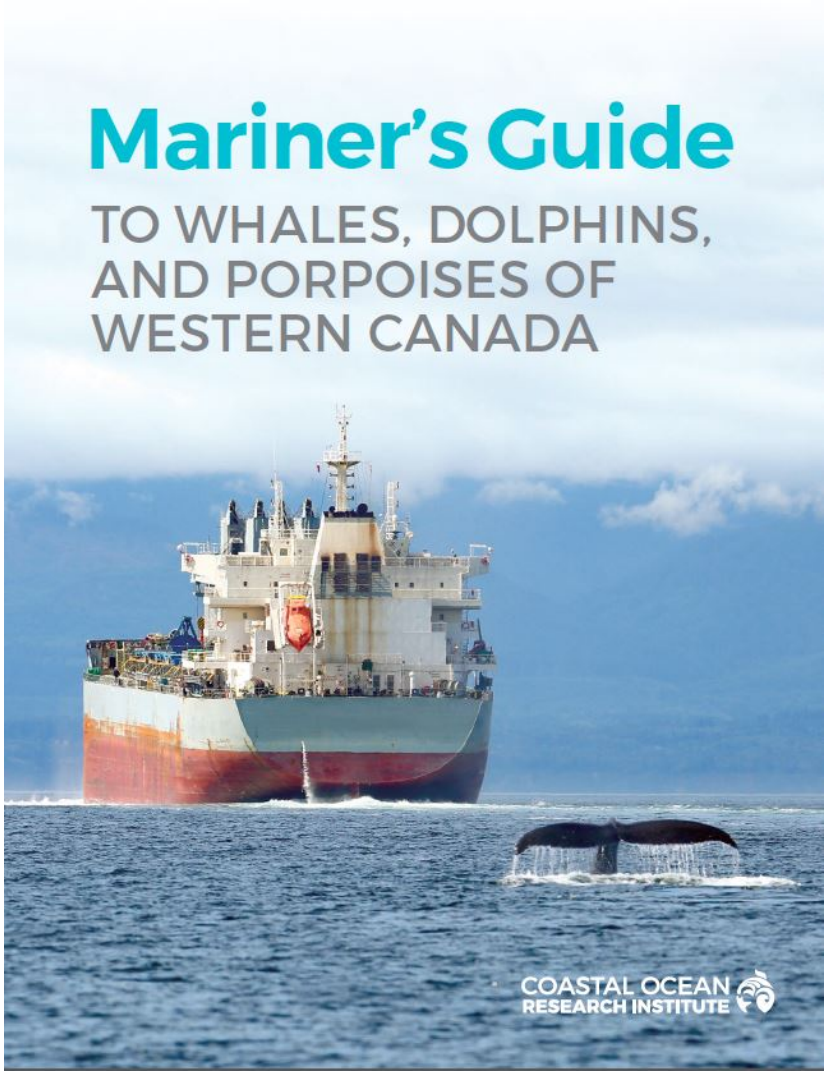
Marine Mammal Program

- Program launched spring 2015
- Supporting science and research projects
- Promoting collection of whale sightings
- Adding underwater noise criteria to the Green Wave program
- Development of Mariners Guide to Whale of Western Canada
- Worked with industry, academics, NGOs and government agencies on new Green Marine performance indicator for underwater noise



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Ocean Network Canada Partnership

Established a partnership with ONC to enhance operational excellance and increase collection of scientific data

- March 2016: ONC extended Smart Oceans BC network to north coast
- Codar and X-Band radar (surface currents and wave height)
- Early detection of earthquakes and tsunamis
- Water CTD
- Hydrophone
- Underwater camera

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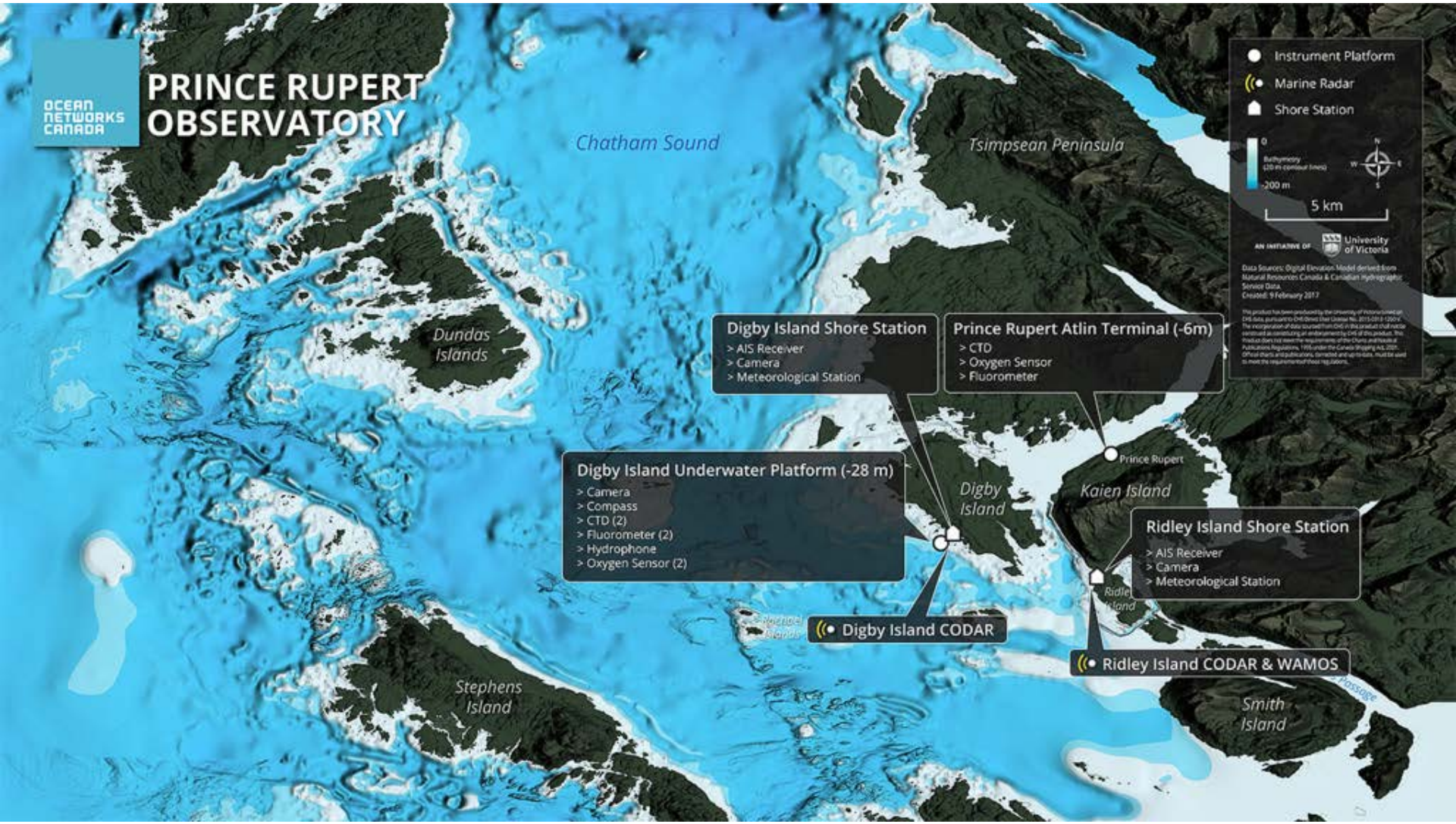
Ocean Network Canada Partnership



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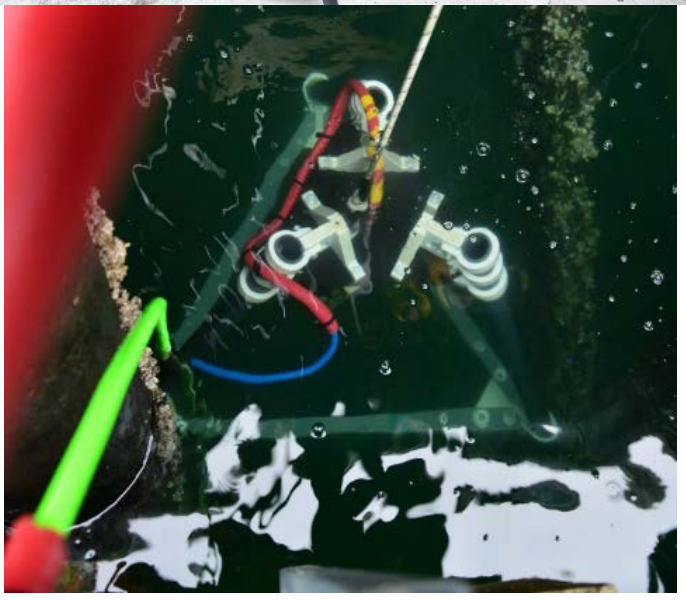
Ocean Network Canada Partnership

In January 2017, a new station was added to the Ocean Networks Canada network in Prince Rupert.

Atlin Terminal Station collects data on:

- Temperature
- Salinity
- Turbidity
- Dissolved Oxygen
- Chlorophyll
- Pressure



Aquatic Invasive Species

An early detection program for the harbour

- Program established in 2012
- Collaboration between PRPA, DFO, Northwest Community College and Smithsonian
- Platewatch Program (tunicates)
- Green Crab monitoring

NWCC used by DFO and Smithsonian in 2015 and 2016 to process samples from north coast.

NWCC has acquired a new microscope to be used for the program.

Water Quality

Establish a long-term monitoring program for the port region and work to minimize impacts and improve water quality

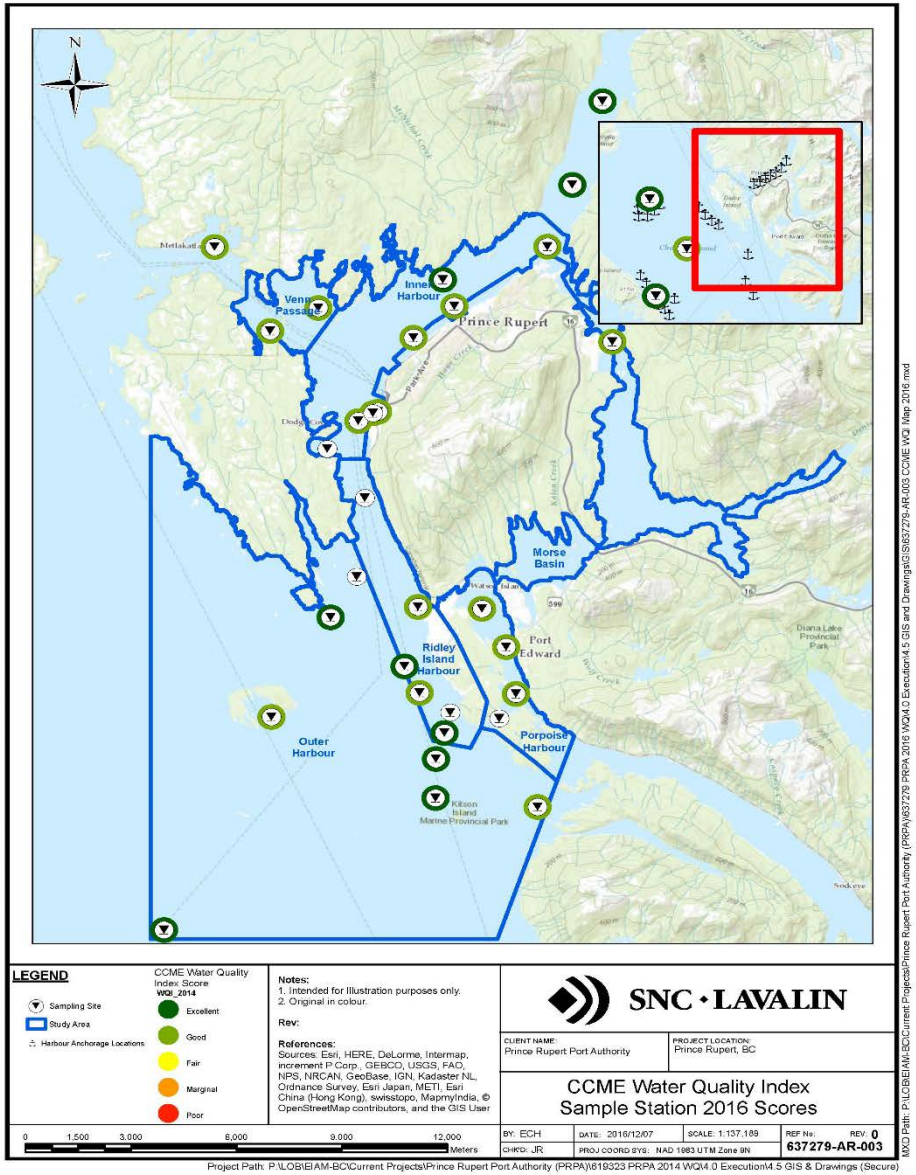
- Marine Environmental Water Quality Program
  - Established in 2013
  - 30 sites around the harbour
  - Collaboration between PRPA, City of Prince Rupert and four local proponents
- Storm water sampling and filters
- Commercial ship inspections

PORT OF PRINCE RUPERT

Marine Environmental Water Quality Program

Marine Environmental Water Quality Program sampling sites

- Develop a long term monitoring program to establish baseline and monitor for trends over time
- Parameters include:
  - General parameters
  - Nutrients
  - Metals
  - PAHs
  - Chlorophyll



Pollution Tracker Program

Established by the Ocean Pollution research Program at the Vancouver Aquarium.

Collecting a BC coastwide assessment of pollutants in the ecosystem.

Samples of sediment and muscles collected and analyzed.

Up to three tiers of analysis conducted including:

- Metals
- Hydrocarbons
- Pesticides
- Dioxins and furons
- Microplastics

Two samples collected in the Prince Rupert area in 2016.

Shoreline Cleanup

- May 16
  - Cow Bay area
  - 19 participants
  - 92 kg debris

- Oct 14
  - Mish Aw Road (Industrial Park)
  - 25 participants
  - 242 kg debris
  - A lot of fish waste

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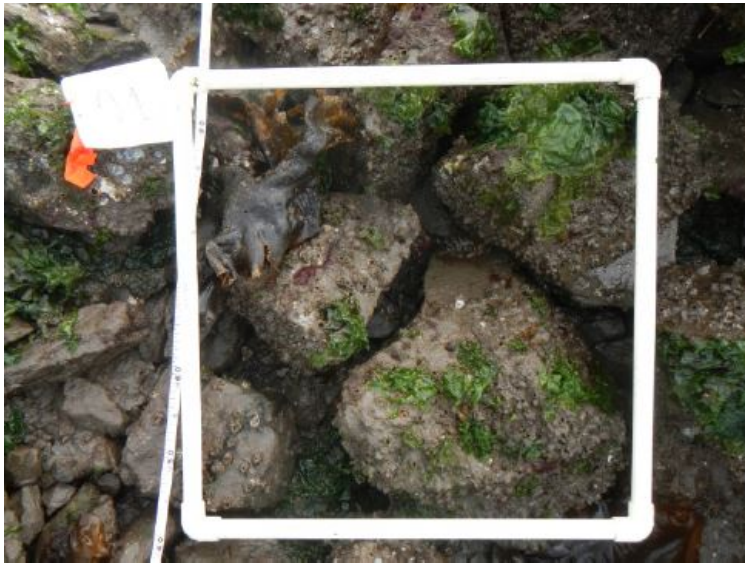
RRUC Reefs

Forty reefs constructed in Porpoise Harbour as compensation for the Road Rail Utility Corridor.

The reefs have shown growth of algae, kelp, invertebrates and fish.

Completed year two of a five year monitoring program.

Comparing productivity of the reefs against two reference sites in the area.



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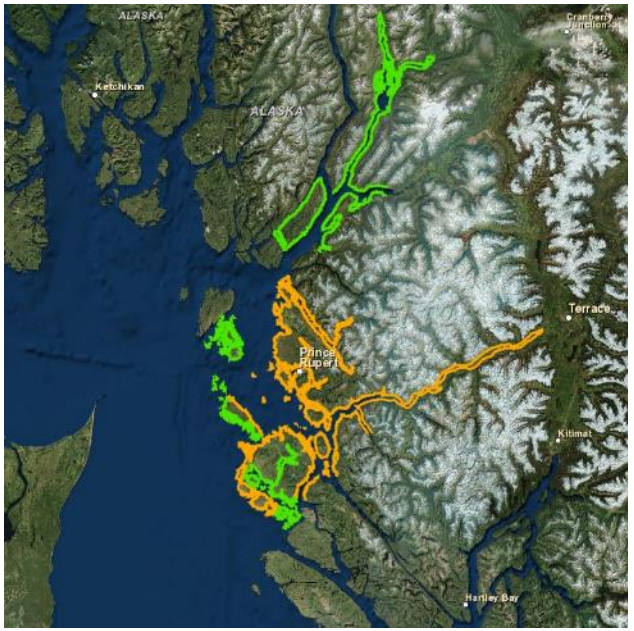
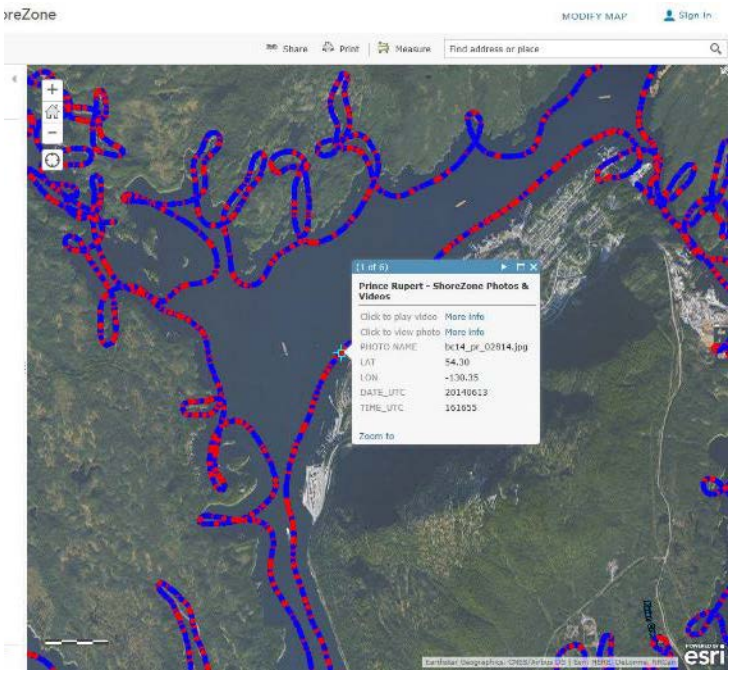
ShoreZone Survey

Establish an understanding and inventory of shorelines and coast of the region

- Port led initiative with currently six partners
- Over 4000 km surveyed
- Photos and video available online
- Mapping of biological and physical features completed for 600 km
- Uses have included:
  - Project and environmental planning
  - Emergency preparedness and response
  - Traditional resources for First Nations





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Green Marine Program

- Program established 2007
- Collaboration of ship owners, ship yards, port authorities in Canada and US
- Prince Rupert Port Authority joined program in 2010
- First west coast participant
- Performance indictors include:
  - Air emissions and GHG
  - Community impact
  - Environmental leadership
- Core of program is continued improvement
- Program has facilitated communication and collaboration with other participants and supporters including NGOs, academics and government agencies.

GREEN
MARINE

GREEN MARINE

Participants

Prince Rupert Port Authority
Ridley Terminals Inc
DP World
Saam Smit
Tidal Transport
Pinnacle Renewable Energy
BC Ferries

Supporters

City of Prince Rupert
District of Port Edward
Environment Canada
Transport Canada
Fisheries and Oceans Canada
Ocean Networks Canada
BC Chamber of Shipping
WWF
Vancouver Aquarium
Northwest Community College
Quickload
Pacific Northwest LNG
Western Canada Marine Response Corporation
Pacific Pilotage Authority
BC Coast Pilots
Ducks Unlimited
Pacific Salmon Foundation

COMMITMENT TO COMMUNITY

Inform, Engage, Invest

- Strong community and labour support for industry and expansion
- Building awareness & confidence in gateway economy, environmental stewardship, marine safety
- Public communication, dialogue and consultation commitments
- Establishment of the Community Information Forum
- Dedicated Community Investment Fund: $2.5 million invested in past five years

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In Summary……

- Commitment to operational and environmental excellence
- Strong leadership
- Continued engagement with First Nations, community and stakeholders
- Real collaboration and real partnerships

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