PORT of SAN DIEGO

Implementation Update on the Shelter Island Yacht Basin TMDL Monitoring Program

MIACC Fall Meeting
October 16, 2018

Karen Holman,
Director | Environmental Protection

Kelly Tait,
Senior Environmental Specialist | Environmental Protection

Agenda

1. TMDL Overview
2. TMDL Milestone
3. Water Quality and Toxicity Data
4. SIYB and Statewide Efforts

arnec fosler wheeler

Shelter Island Yacht Basin
TMDL Monitoring Station Locations

FIGURE
4-1

TMDL Overview

- Shelter Island Yacht Basin in San Diego Bay
- ~2,300 slips
- 76% load reduction over 17 years
- Subsequent IO to the Port of San Diego to monitor progress annually and report back to San Diego Regional Board

TMDL Timeline

Stage	Years	Loading Reduction	Load Target (kg/yr)
1	2007	0%	2,163
2	2012	10%	1,900
3	2017	40%	1,300
4	2022	76%	567

TMDL Copper Load By Source

Source	Contributions to SIYB (Percent Dissolved Copper)
Passive Leaching	93
Hull Cleaning	5
Urban Runoff	1
Background	1
Direct Atmospheric Deposition	<1
Sediment	0
Total	100

Source: 2005 SIYB TMDL

TMDL Milestone

Regulatory Achievements Thus Far:
Shelter Island Copper TMDL

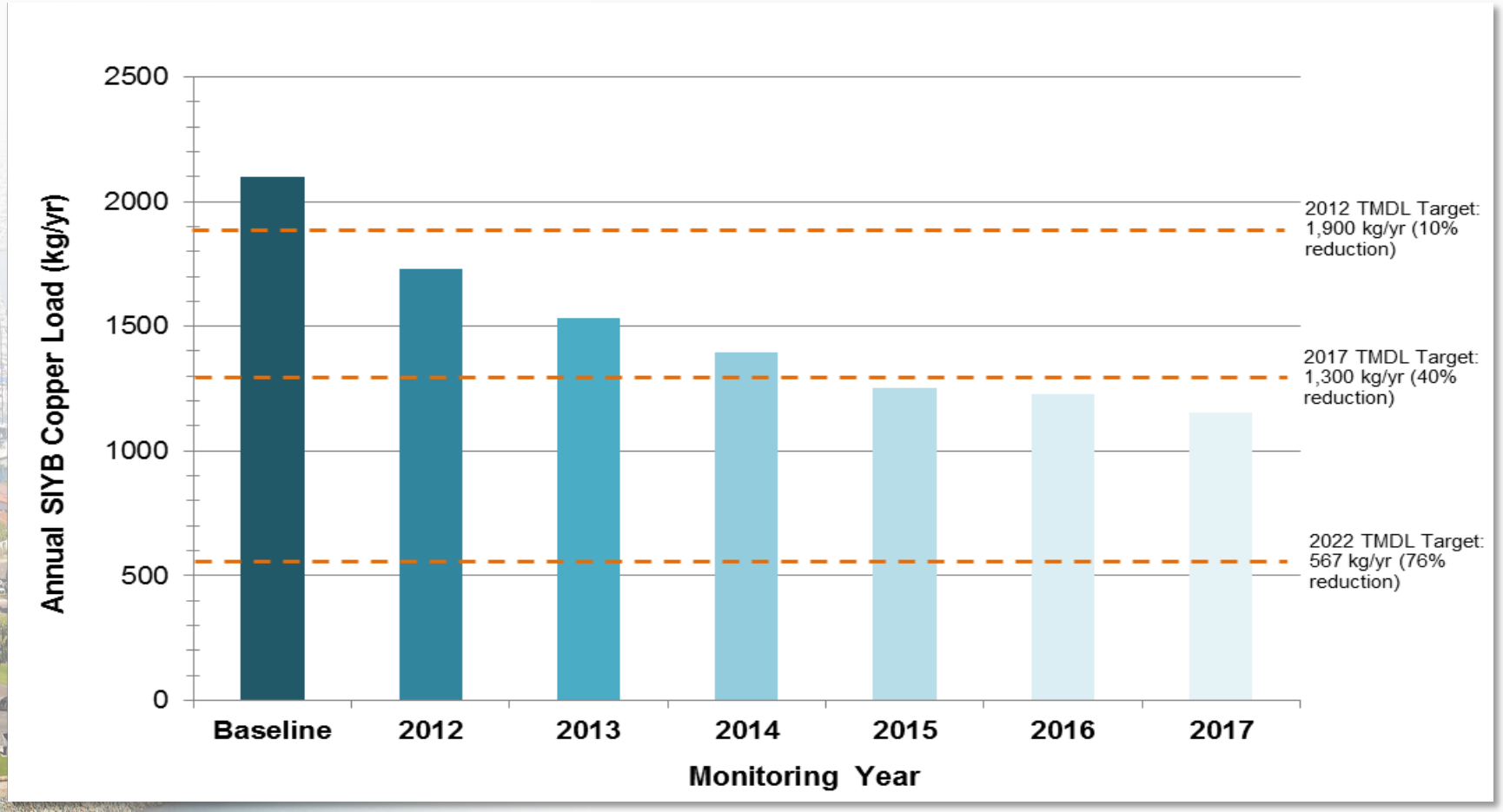
- Continued efforts to identify load reductions from paint, hull cleaning, BMPs, etc.
- Continued tracking and conversion of vessels from copper to non-copper paints
- San Diego Regional Water Quality Control Board confirmed interim compliance

TMDL Compliance Schedule

Stage	Years	Loading Reduction	Load Target (kg/yr)	Actual Loading Reduction
1	2007	0%	2,163	Baseline
2	2012	10%	1,900 ✓	17.6%
3	2017	40%	1,300 ✓	45.4%
4	2022	76%	567	TBD

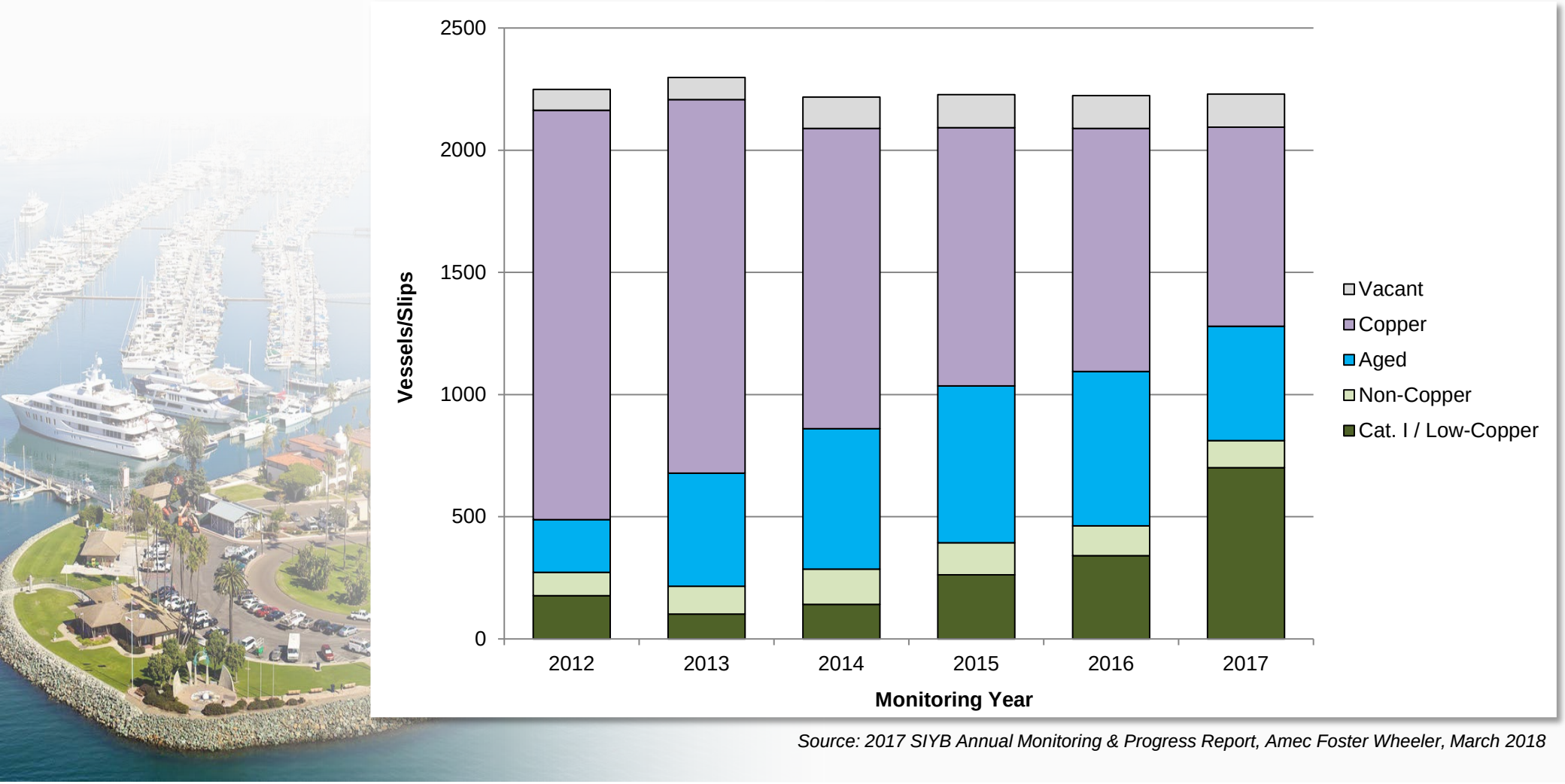
Copper Loading

Annual Copper Load Estimate



Source: 2017 SIYB Annual Monitoring & Progress Report, Amec Foster Wheeler, March 2018

Annual Load Categories per TMDL Year



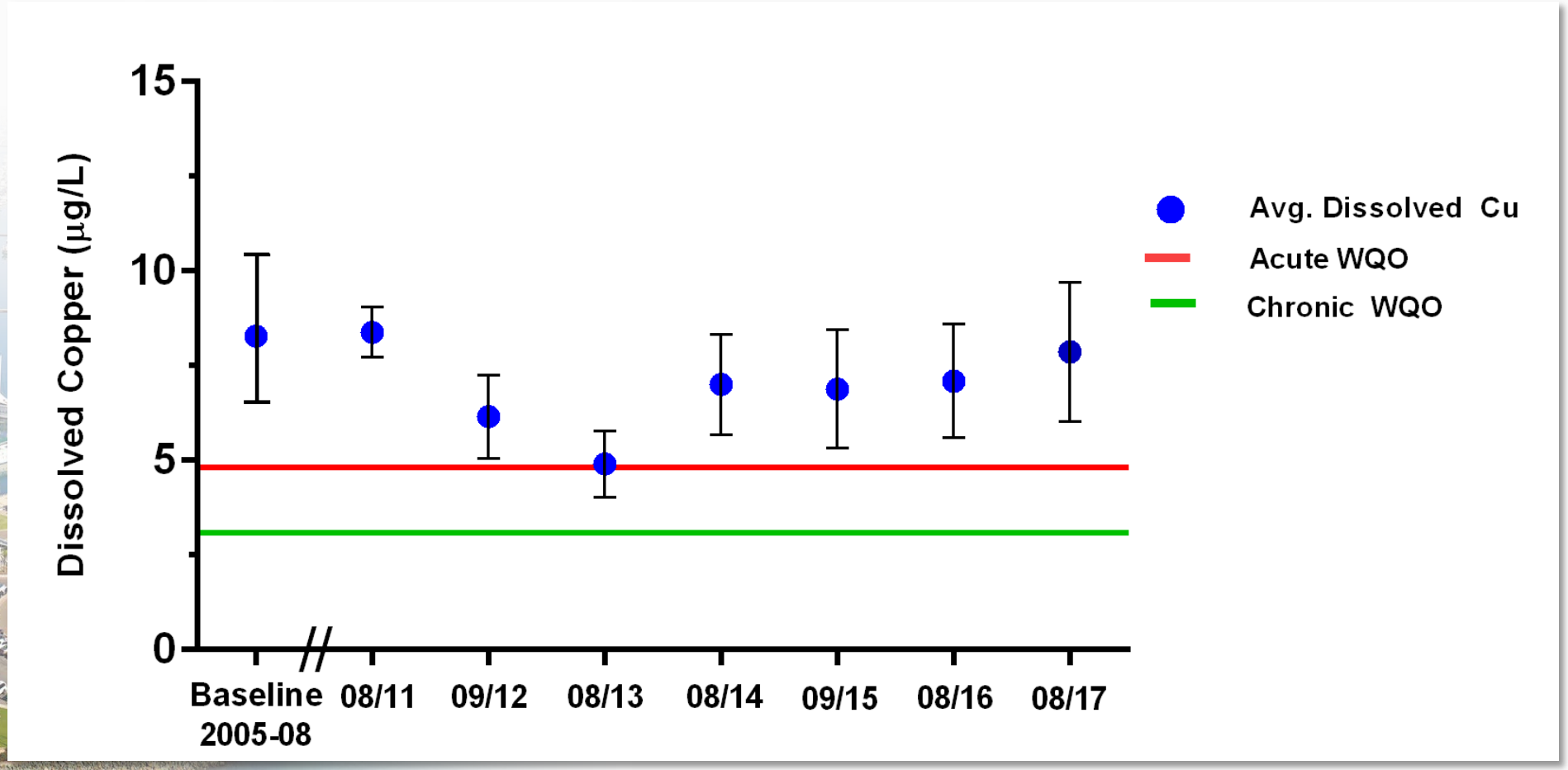
Source: 2017 SIYB Annual Monitoring & Progress Report, Amec Foster Wheeler, March 2018

Annual Load Calculations

- Copper loading tracked annually
- Each category of paint assigned a load (example: high copper paints and unknowns= full load, Cat 1 paints= half load non-copper paints= zero load).
- Approach vetted with the Regional Board prior to implementation.
- Loading reductions calculated by comparing to assumptions found in the Regional Board's 2005 TMDL:
    - All 2,363 SIYB slips or buoys occupied by a number of vessels
    - All 2,363 recreational vessels moored within SIYB have copper-based paints 100% of the time
    - Annual loading from passive leaching basin wide equals 2,000 kg/yr
    - Annual loading from hull cleaning equals 100 kg/yr
    - Average annual loading per vessel with copper hull paint equals 0.9 kg/yr

Water Quality and Toxicity

Water Quality
Average Dissolved Copper



Source: 2017 SIYB Annual Monitoring & Progress Report, Amec Foster Wheeler, March 2018

Toxicity

- No acute toxicity to fish larvae
- Chronic toxicity observed each year at only 1-2 stations: SIYB-1 (2012-2017) and SIYB-2 (2012, 2015, 2017)
- Each toxicity hit occurred where concentrations have been greater than ~10 µg/L

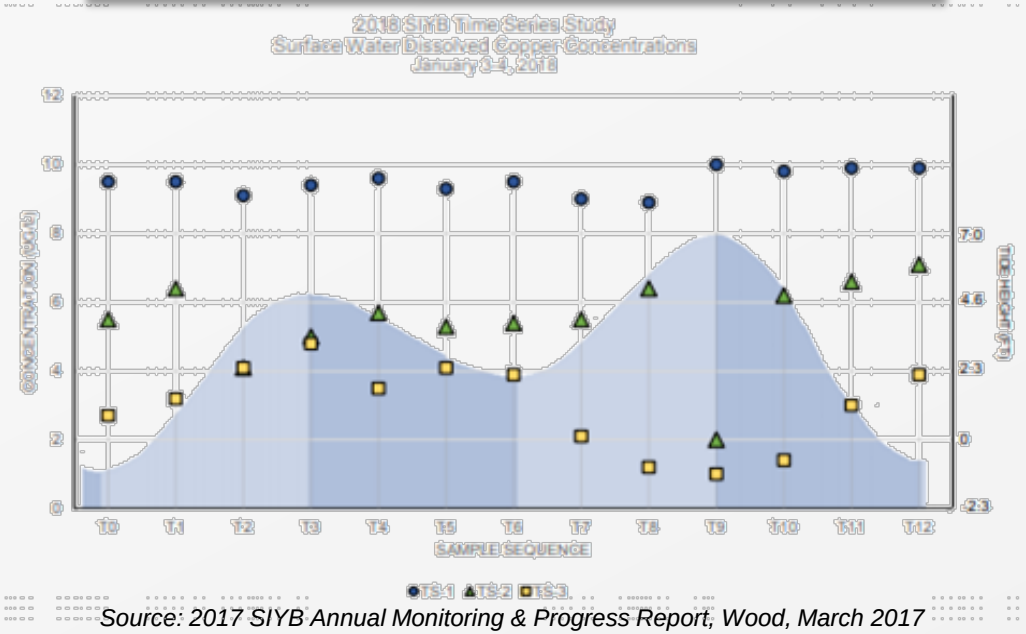
Location	Aug. 2011	Oct. 2011	2012	2013	2014	2015	2016	2017
SIYB-1	--	X	X	X	X	X	X	X
SIYB-2	--	--	X	--	--	X	--	X*
SIYB-3	--	--	--	--	--	--	--	--
SIYB-4	--	--	--	--	--	--	--	--
SIYB-5	--	--	--	--	--	--	--	--
SIYB-6	--	--	--	--	--	--	--	--
SIYB-REF	--	--	--	--	--	--	--	--

***Prior to 2017, all toxicity samples analyzed were unfiltered samples. For 2017, both filtered and unfiltered samples were analyzed. At SIYB-2, toxicity was observed in the unfiltered sample; no toxicity was observed in the filtered sample.**

Copper Reduction Program-Overview

Key Initiatives in 2017

- Study of SIYB tidal influence completed
- Copper remediation pilot projects through Blue Economy Incubator
- Culvert feasibility assessment ongoing
- Dept. of Pesticide Regulation Copper leach rate regulation (effective July 1, 2018)



Source: 2017 SIYB Annual Monitoring & Progress Report, Wood, March 2017

Major Accomplishments of CRP during Interim Compliance Stage 3

Copper Reduction Program Component	Initiative	2013	2014	2015	2016	2017	Direct (D) or Indirect (I) Load Reduction?	Completed (C) or On-Going (O)	5 Year Summary
Policy Development/Legislation	AB 425	Pot Sponsored Bill	Leach Rate Established (DPR)	-	-	DPR Leach Rate Regulation Adopted	D	O	• 1 State Bill Sponsored • 5 Comment letters submitted regarding copper related issues • 19 IWHC Enforcement Actions
	EPA	-	BLM Letter	-	BLM Letter	Registration Review Letter	I	C	
	IWHC	1st Full Year of Regulation	Regulations remain in place: Permits issued and reissued, continued enforcement				D	O	
Testing and Research	Paint Research	Port Grant funded research	On-going additional research and information dissemination				D	C (Grant), O (research)	• Early stage paint research funded by Port grant • Continued research by Port staff and dissemination of what is learned to boatyards, marinas, boaters • BEI established and RFP issued for technology solutions to copper issues
	Other Technologies	-	-	-	Blue Economy Incubator (BEI) established, RFP released	2 BEI copper-related projects selected	D	O	
	Culvert Feasibility	Tidal Flushing Modeling	-	-	Engineering culvert Feasibility Study	Continued internal feasibility discussions	D	O	
Hull Paint Transitions:	Port Fleet	Full fleet converted and maintained with non-copper hull paint					D	O	• Entire Port vessel fleet converted to non-copper hull paint resulting in 11.01 kg/yr load reduction • 41 total vessels converted to non-copper hull paint under the 319(h) grant resulting in 36.9 kg/yr load reduction
	Private Recreational Boats[1]	27 vessels converted under 319(h)	5 vessels converted under 319(h)	7 vessels converted under 319(h)	Conversions maintained		D	C	
Education and Outreach	Events	Signature hull paint expo event launched; Boating event outreach	Signature expo; Boating event outreach	Boating event outreach	Signature expo; Boating event outreach	-	I	O	• 23 booths at boated related events (reaching 260,700 people) • 4 Expos hosted • 3 brochures/print materials created • Over 500 print materials distributed to boatyards • 2,226 views on Web-Based calculator • 962 views on Boater Testimonial video • 7 Press Releases • 4 newspaper articles
	Web Material	Paint Conversion Cost Calculator completed	On-going updates of special website, Peer-based testimonial video available to view				I	O	
	Print Material	Press Releases	Paint information packets	Boater Paint Brochure, Press Releases	Press Releases, Newspaper Articles		I	O	

Major Accomplishments of CRP during Interim Compliance Stage 3

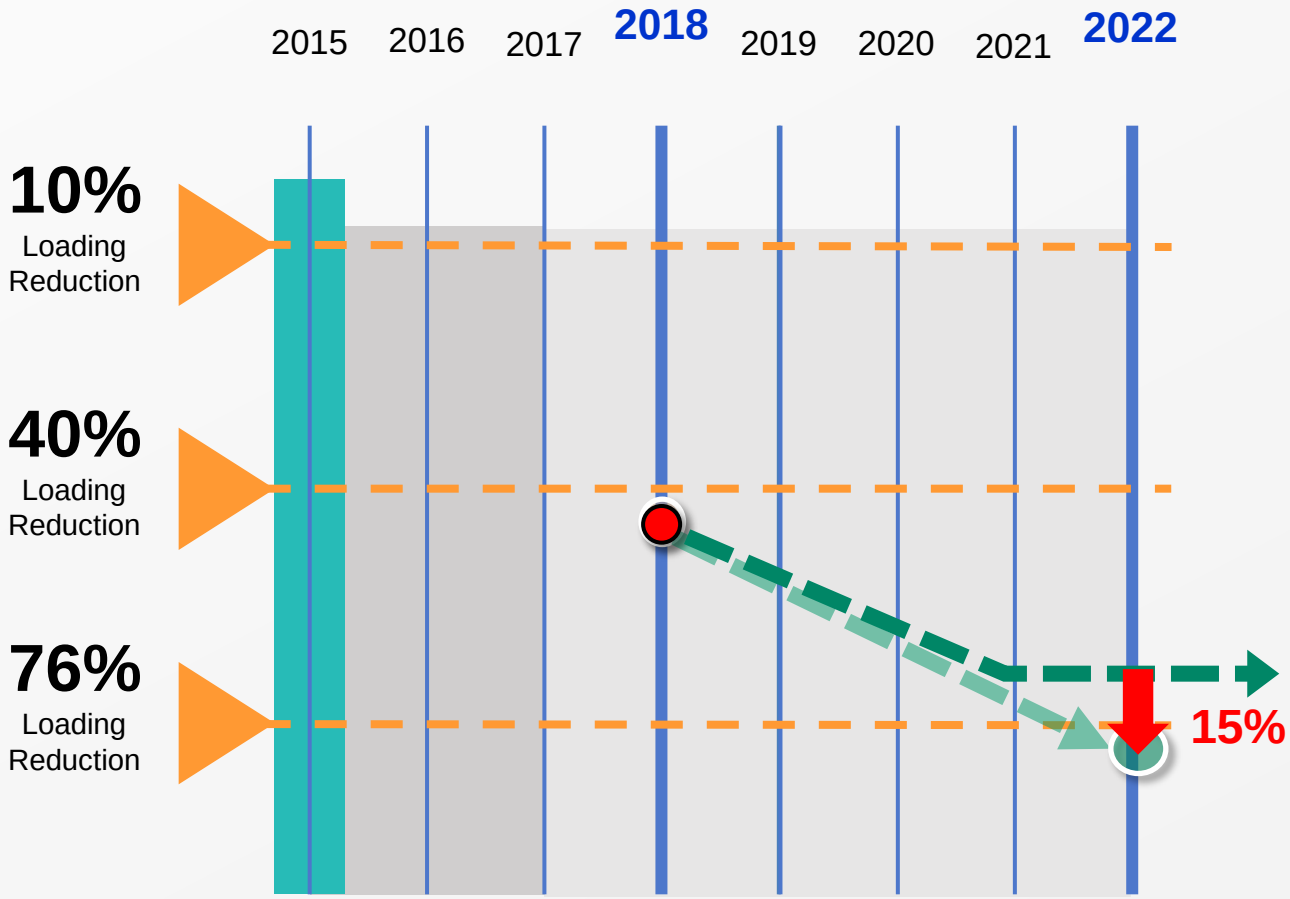
Copper Reduction Program Component	Initiative	2013	2014	2015	2016	2017	Direct (D) or Indirect (I) Load Reduction?	Completed (C) or On-Going (O)	5 Year Summary
Monitoring and Assessment	Annual Water Quality Monitoring	Annual water quality monitoring for dissolved copper at TMDL stations					I	O	• Annual compliance monitoring show meeting interim TMDL target load reductions • 2 updates to CSM •1 Modeling Study • 2 Special Studies • 1 completed RHMP cycle and planning 2018
	Conceptual Model	Updated		-	-	-	I	C	
	Water Column Special Study	-	-	Development	Final report	-	I	C	
	24 hr. Tidal Special Study	-	-	-	-	Development	I	O	
	RHMP Core Monitoring	Core monitoring conducted	Data analysis and draft reporting		Final report	2018 core monitoring planning	I	C (2013) O (2018)	
	Modeling Study	Development	Final report	-	-	-	I	C	

Port was directly involved in the conversions of private recreational vessels through the 319 (h) Grant program.

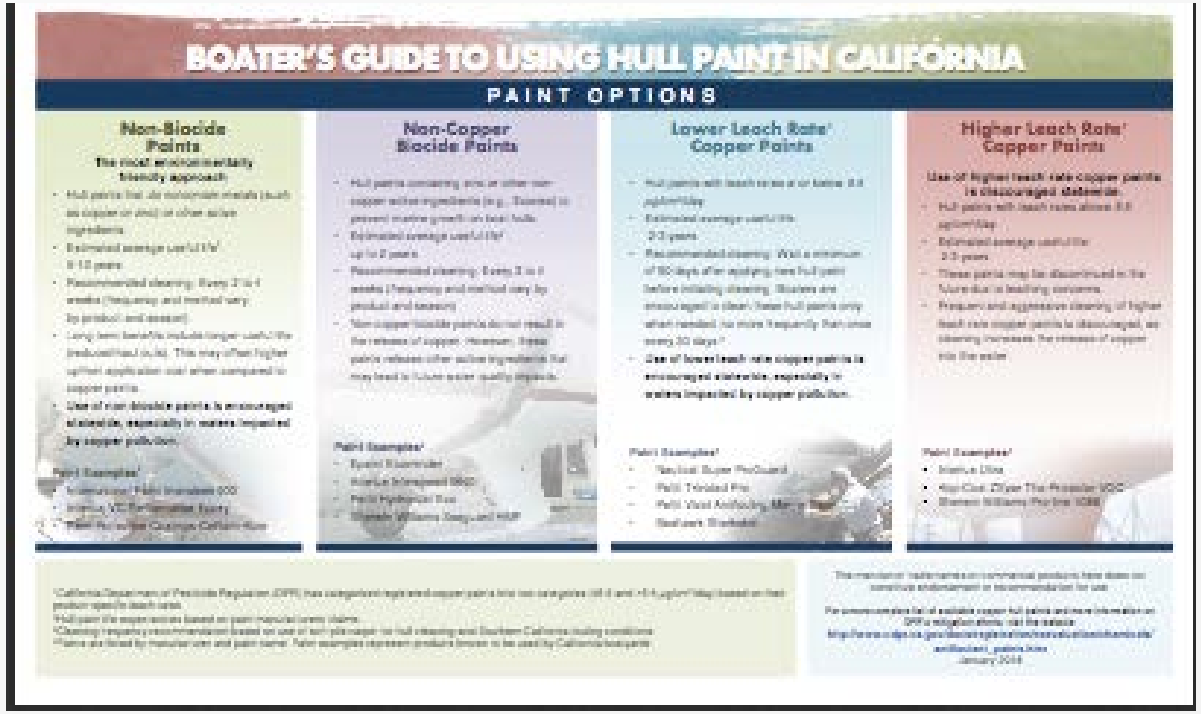
Shelter Island Yacht Basin and Statewide Efforts

Dept. of Pesticide Regulation: Copper Paint Rule

- Statewide Regulation started July 1, 2018
- CAT 1 copper paints only available option for recreational boats
- Applies to point of sale (boatyards)
- 3-year average life cycle of paints
- Potential to reduce copper load by ~338 kg/yr (61% total loading reduction) by 2021



Education and Outreach Efforts



Ongoing Adaptive Management

Hull Cleaning

Hull Paints

Alternative Mechanisms?

PORT of SAN DIEGO

Implementation Update on the Shelter Island Yacht Basin TMDL Monitoring Program

MIACC Fall Meeting
October 16, 2018

Karen Holman,
Director | Environmental Protection

Kelly Tait,
Senior Environmental Specialist | Environmental Protection