



Overview of the State Lands Commission's 2018 Report on Ballast Water Treatment Technology

Prevention First | September 26, 2018

CALIFORNIA STATE LANDS COMMISSION

California State
Lands Commission



Nonindigenous Species (NIS)

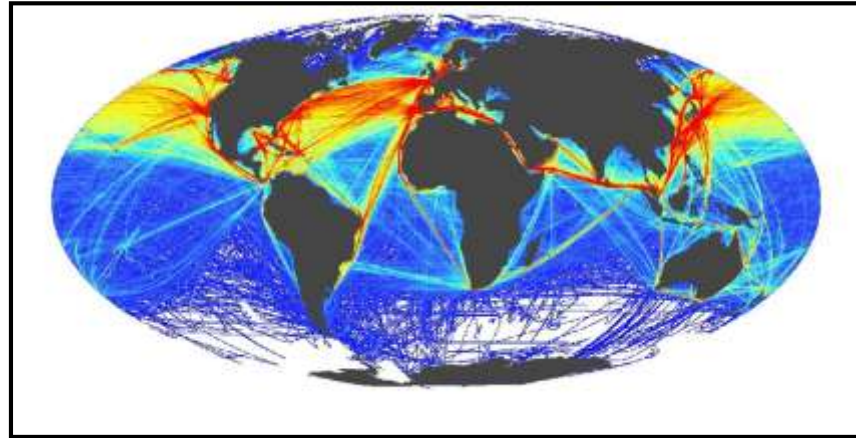


Nonindigenous Species

Why Manage Vessels for NIS?

\$120,000,000,000 in losses and damages per year in U.S.

[\(Pimental et al. 2005\)](#)



California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Coastal Ecosystems Protection Act

What did this Act do?

Set Ballast Water Discharge Performance Standards

Technology Review

Required the Commission to review technology 18 months prior to scheduled implementation

California's Interim

Ballast Water Discharge Performance Standards

Organism Size Class	California	USCG/EPA
Organisms greater than 50 µm in minimum dimension	No detectable living organisms	< 10 living organisms per cubic meter
Organisms 10 – 50 µm in minimum dimension	< 0.01 living organisms per ml	< 10 living organisms per ml
Living organisms less than 10 µm in minimum dimension	< 10 ³ bacteria/100 ml < 10 ⁴ viruses/100 ml	
<i>Escherichia coli</i>	< 126 cfu/100 ml	< 250 cfu/100 ml
Intestinal enterococci	< 33 cfu/100 ml	< 100 cfu/100 ml
Toxicogenic <i>Vibrio cholerae</i> (O1 & O139)	< 1cfu/100 ml or < 1cfu/gram wet weight zoological samples	< 1 cfu/100 ml or < 1 cfu/gram wet weight zooplankton samples

California's Ballast Water Discharge Performance Standards Implementation Timeline

Interim standards

- Newly built vessels - construction on or after January 1, 2020
- Existing vessels – first regularly scheduled dry dock on or after January 1, 2020

Final standards – No living organisms in all size classes

- January 1, 2030

California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Implementing Performance Standards

*How to meet the
Performance Standards?*

Options:

- Retain all ballast water on board
- Alternate methods
- Shipboard ballast water management systems
- Shore-based ballast water reception and treatment facilities

**No requirement to Install Shipboard
Management Systems**

California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Implementing Performance Standards

Reviewing Technology

Report Contents

- Efficacy
- Availability
- Environmental impacts

California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Implementing Performance Standards

Reviewing Technology

Report Process

- Advisory panel
- Provide assessment if technology is not available to meet the interim California Ballast Water Discharge Performance Standards

California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Implementing Performance Standards

History of Implementation

Reviews of Technology

Reviews in 2007, 2008, 2010, 2013 and 2014

Legislation

Delayed the performance standards in 2008, 2013, and 2015



California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

Implementing Performance Standards

2018 Report

Status

Review of shipboard and shore-based technology

California's Response to NIS

Preventing the Spread of NIS from Vessel Movement

2018 Report Reviewing Technology

Report Summary

Preliminary Findings

- Technology cannot meet the interim California Performance Standards
- Why is technology not available?

2018 Report Reviewing Technology

Technology Efficacy

Shipboard Technology

*Challenges with
Reviewing Technology*

Data Availability

- USCG FOIA request
- Data received and reviewed is from Independent Labs and treatment system manufacturers
- Data presented anonymously

2018 Report Reviewing Technology

Technology Efficacy

Shipboard Technology

*E. coli, intestinal
enterococci, V. cholerae*

Preliminary Findings

Systems met these interim California
Performance Standards

2018 Report Reviewing Technology

Technology Efficacy

Shipboard Technology

Total living viruses

Total living bacteria

Preliminary Findings

No method to quantify to these interim California Performance Standards

2018 Report Reviewing Technology

Technology Efficacy

Shipboard Technology

Organisms greater than 50 μm in minimum dimension

Organisms 10-50 μm in minimum dimension

Preliminary Findings

Systems did not meet these interim California Performance Standards

Preliminary Finding

Land-based tests: Organisms greater than 50 μ m size class

BWMS Number	Number of Tests per system	Percent of BWMS Tests			
		No Detection	>0 \leq 5	>5<10	\geq 10
1	15	53.3	46.7	0.0	0.0
2	14	64.3	35.7	0.0	0.0
3	15	66.7	33.3	0.0	0.0
4	17	41.2	35.3	11.8	11.8
5	16	37.5	25.0	31.3	6.3
6	18	44.4	55.6	0.0	0.0
7	15	6.7	86.7	6.7	0.0
8	25	40.0	56.0	4.0	0.0
9	16	62.5	37.5	0.0	0.0
10	18	66.7	33.3	0.0	0.0
11	18	50.0	33.3	11.1	5.6
12	27	59.3	40.7	0.0	0.0
13	15	93.3	6.7	0.0	0.0
14	28	32.1	53.6	14.3	0.0
15	19	21.1	78.9	0.0	0.0

Preliminary Finding

Shipboard tests: Organisms greater than 50µm size class

BWMS Number	Number of BWMS Tests	Percent of BWMS Tests		
		No Detection	>0≤5	>5<10
1	6	50	50	0
2	5	20	60	20
3	5	0	80	20
4	5	20	80	0
5	5	20	80	0
6	5	20	40	40
7	5	40	60	0
8	5	40	40	20
9	6	50	50	0
10		No Data		
11		No Data		
12		No Data		
13	5	60	40	0
14	5	0	60	40
15		No Data		

Preliminary Finding

Land-based tests: Organisms 10-50 μ m size class

BWMS Number	Number of BWMS Tests	Percent of BWMS Tests		
		No Detection	>0 \leq 5	>5<10
1	15	0.0	100.0	0.0
2	15	33.3	60.0	6.7
3	15	6.7	80.0	13.3
4	17	17.6	82.4	0.0
5	16	81.3	18.8	0.0
6	20	10.0	90.0	0.0
7	15	46.7	53.3	0.0
8	28	3.6	92.9	3.6
9	16	31.3	68.8	0.0
10	18	38.9	50.0	11.1
11	18	72.2	27.8	0.0
12	27	0.0	92.6	7.4
13	15	80.0	20.0	0.0
14	24	8.3	25.0	66.7
15	19	31.6	63.2	5.3

Preliminary Finding

Shipboard tests: Organisms 10-50 μ m size class

BWMS Number	Number of BWMS Tests	Percent of BWMS Tests			
		No Detection	>0 \leq 5	>5<10	\geq 10
1	5	0	80.0	20.0	0
2	5	40.0	60.0	0.0	0
3	5	20.0	80.0	0.0	0
4	5	80.0	20.0	0.0	0
5	5	80.0	20.0	0.0	0
6	10	0	70.0	20.0	10.0
7	7	28.6	71.4	0.0	0
8	5	0	80.0	20.0	0
9	6	33.3	66.7	0.0	0
10	5	40.0	60.0	0.0	0
11	0	No Data			
12	5	20.0	60.0	20.0	0.0
13	0	No Data			
14	1	0.0	100.0	0.0	0.0
15	0	No Data			

2018 Report Reviewing Technology

Why Is Technology Not Available?

Shipboard Technology

Number 1

Based on Best Available Data

No systems are available to meet the interim California Performance Standards

2018 Report Reviewing Technology

Why Is Technology Not Available?

Shipboard Technology

Number 2

System Testing

Technology manufacturers are not testing their system's ability to meet the interim California Performance Standards

2018 Report Reviewing Technology

Technology Efficacy and Why Is Technology Not Available?

Shore-based Technology

No facilities available

Commission Funded Feasibility Study
Shore-based Ballast Water Reception and
Treatment

2018 Report Reviewing Technology

Why Is Technology Not Available?

Additional Challenges

*Organisms 10-50 μm in
minimum dimension*

Sampling and Analysis

It is impractical to process such a large sample of water under the timeframe necessary to limit sampling-induced mortality and human error.

2018 Report Reviewing Technology

Why Is Technology Not Available?

Additional Challenges

Total living viruses

Total living bacteria

Analysis

No available methods to analyze ballast water samples for these interim California Performance Standards

2018 Treatment Technology Report Next Steps

- ✓ Draft Report
- ✓ Convene the Technical Advisory Panel
 - Present the report for approval to the State Lands Commission
 - Deliver approved report to the California Legislature





www.slc.ca.gov

THANK YOU & QUESTIONS

Jonathan Thompson

Marine Environmental Protection Division

Jonathan.Thompson@slc.ca.gov

916.574.2276



@CAStateLands

California State
Lands Commission

