



# Biofouling Management Regulations at the One-Year Mark: What Have We Learned?

*Long Beach, CA* | September 26, 2018  
Prevention First 2018

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# Why Regulate Biofouling Management? What's the Risk?

## Ballast Water



- Average discharge = 7,600 m<sup>3</sup>
- 10 organisms [ $>50 \mu\text{m}$ ] m<sup>-3</sup>
- Average discharge = 76,000 invertebrates
  - \*\*Acceptable level of risk under IMO/USCG/EPA requirements\*\*

76,000  
invertebrates

# Why Regulate Biofouling Management? What's the Risk?

Ballast Water



76,000  
invertebrates

Biofouling



100,000s of  
invertebrates

# Why Regulate Biofouling Management?

## What's the Risk?

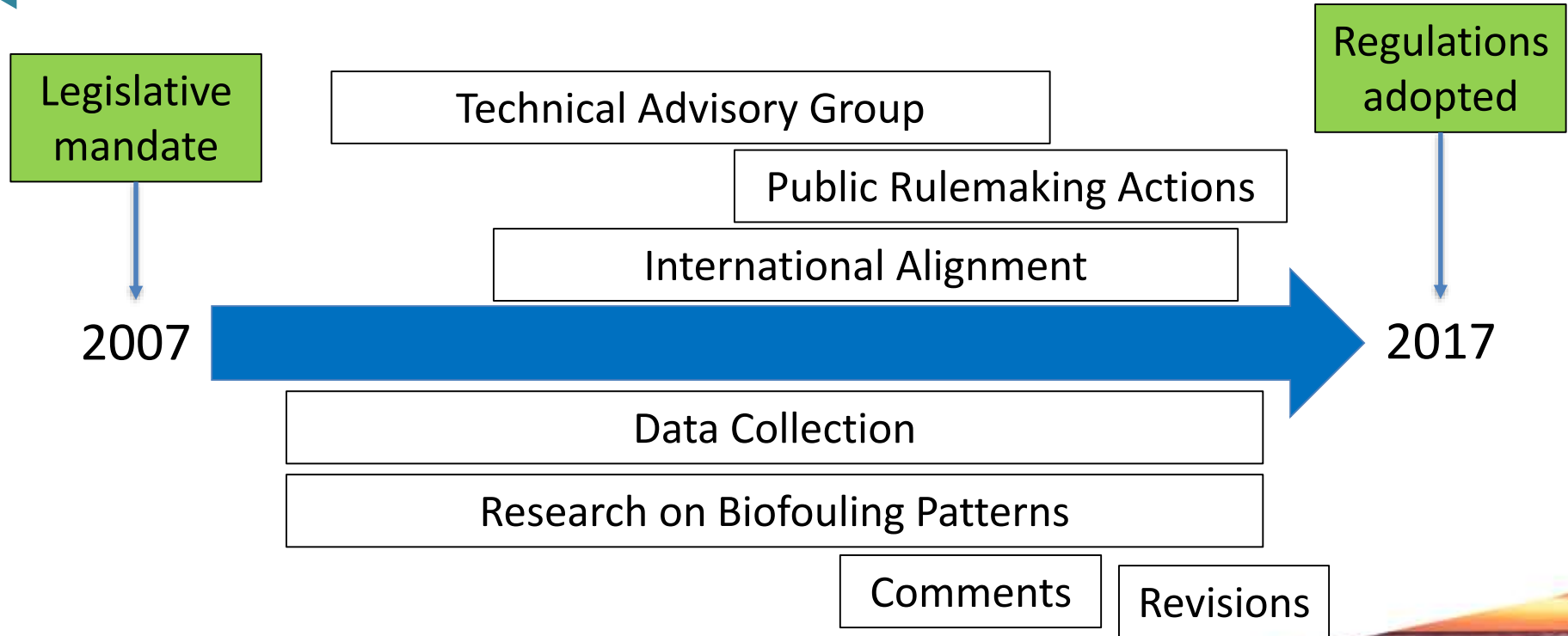
- Davidson et al. 2013: **Richness, extent, condition, reproductive status, and parasitism of fouling communities on commercial vessels**
  - 95.4% of organisms were alive
  - > 91% of mussels had well-developed gonads
  - 25% of barnacles had developed egg masses

### Biofouling



Many millions of invertebrates

# Regulation Development Process



# California's Biofouling Management Regulations



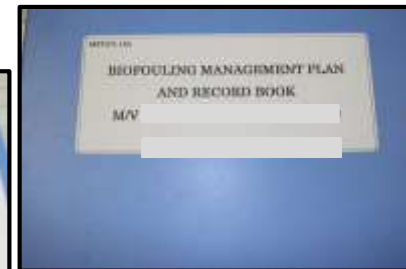
Approved  
20 April 2017

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Effective  
1 October 2017

# Main Components

- Biofouling Management Plan and Biofouling Record Book
  - *International consistency*
- Annual Vessel Reporting Form
- Biofouling management for wetted surfaces
  - Hull and niche areas
- Extended residency periods
- Alternatives and safety exemptions



# Outreach Strategies

- Guidance Document:  
[http://www.slc.ca.gov/Programs/MISP/4\\_8\\_GuidanceDoc.pdf](http://www.slc.ca.gov/Programs/MISP/4_8_GuidanceDoc.pdf)
  - Summary, FAQ, Example Biofouling Management Plan
- Webinar:  
<https://www.youtube.com/watch?v=4r6Bi3Bfolc&feature=youtu.be>
- Customer Service Meetings:
  - Southern and Northern CA
  - Shipping agents





# Outreach Strategies

- Information sheets
  - Vessel crews
- Management requirements:  
[http://www.slc.ca.gov/Programs/MISP/InfoShts/BiofoulingBallast\\_Water\\_Management.pdf](http://www.slc.ca.gov/Programs/MISP/InfoShts/BiofoulingBallast_Water_Management.pdf)
- Reporting and Recordkeeping:  
[http://www.slc.ca.gov/Programs/MISP/InfoShts/Reporting\\_RecordKeeping.pdf](http://www.slc.ca.gov/Programs/MISP/InfoShts/Reporting_RecordKeeping.pdf)



# Implementation

**1 October 2017: Annual Vessel Reporting Form**

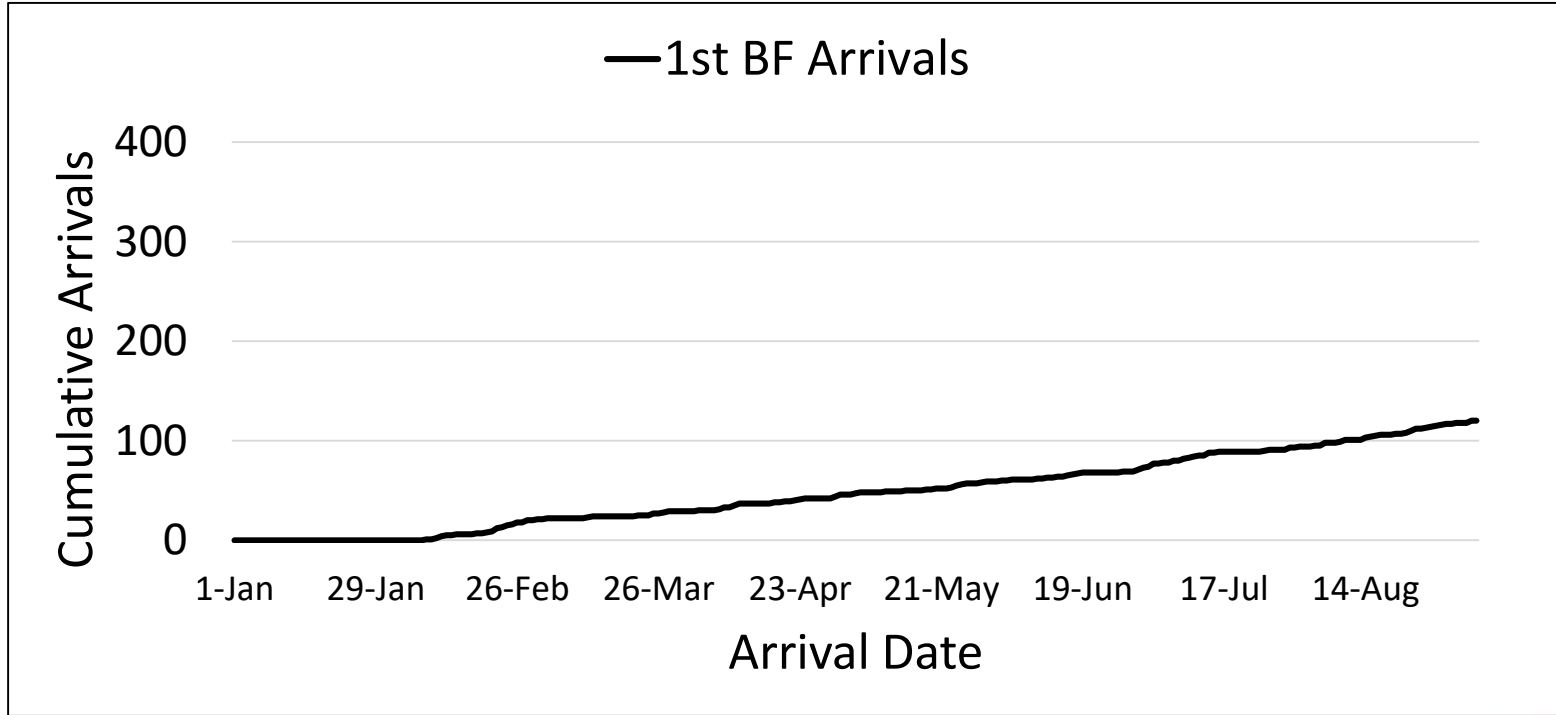


**1 January 2018: Remainder of the regulations became effective**

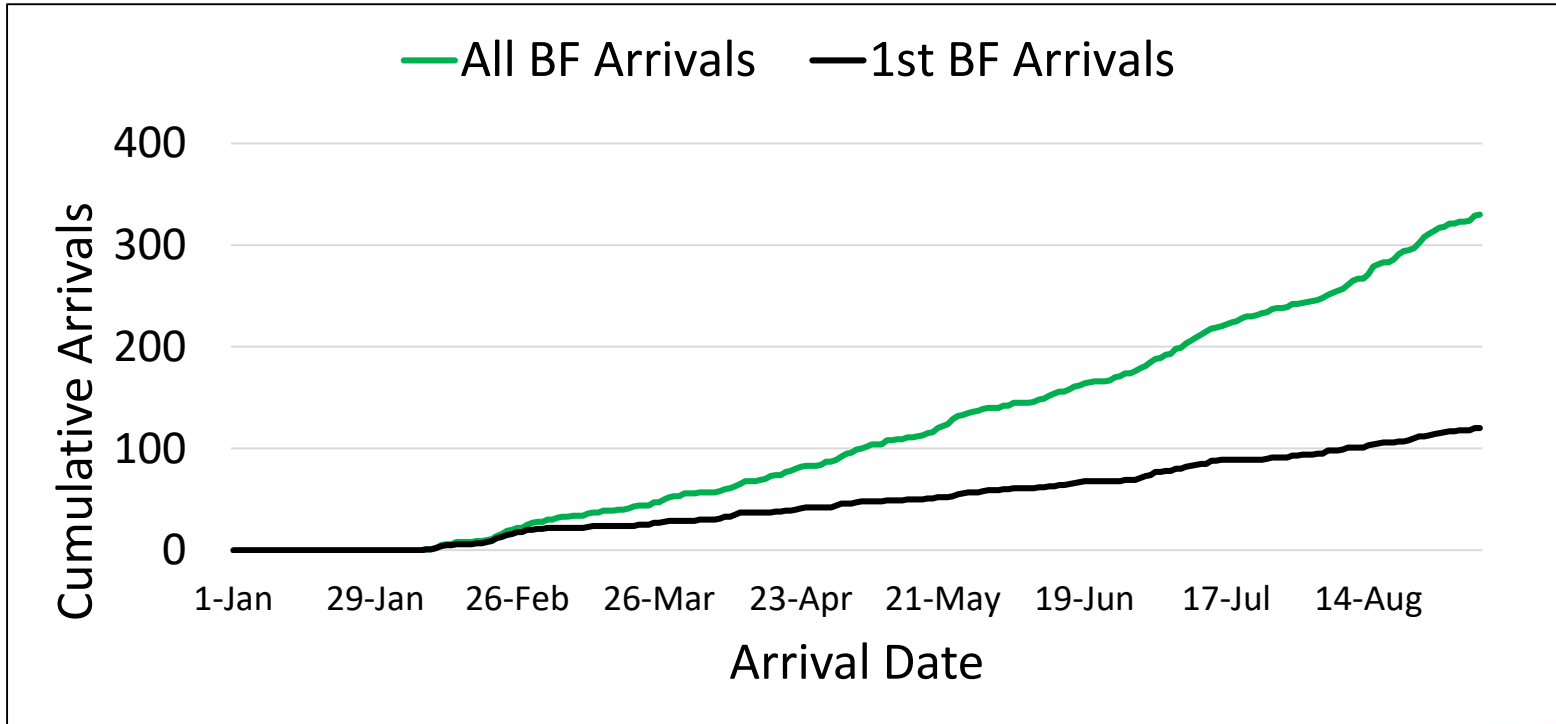
- Phased-in implementation based on:
  - Regularly scheduled dry docking (or delivery) on or after 1 January 2018
- Why phased-in?
  - Effective biofouling management is dependent on Biofouling Management Plans and preventive practices best implemented in dry dock



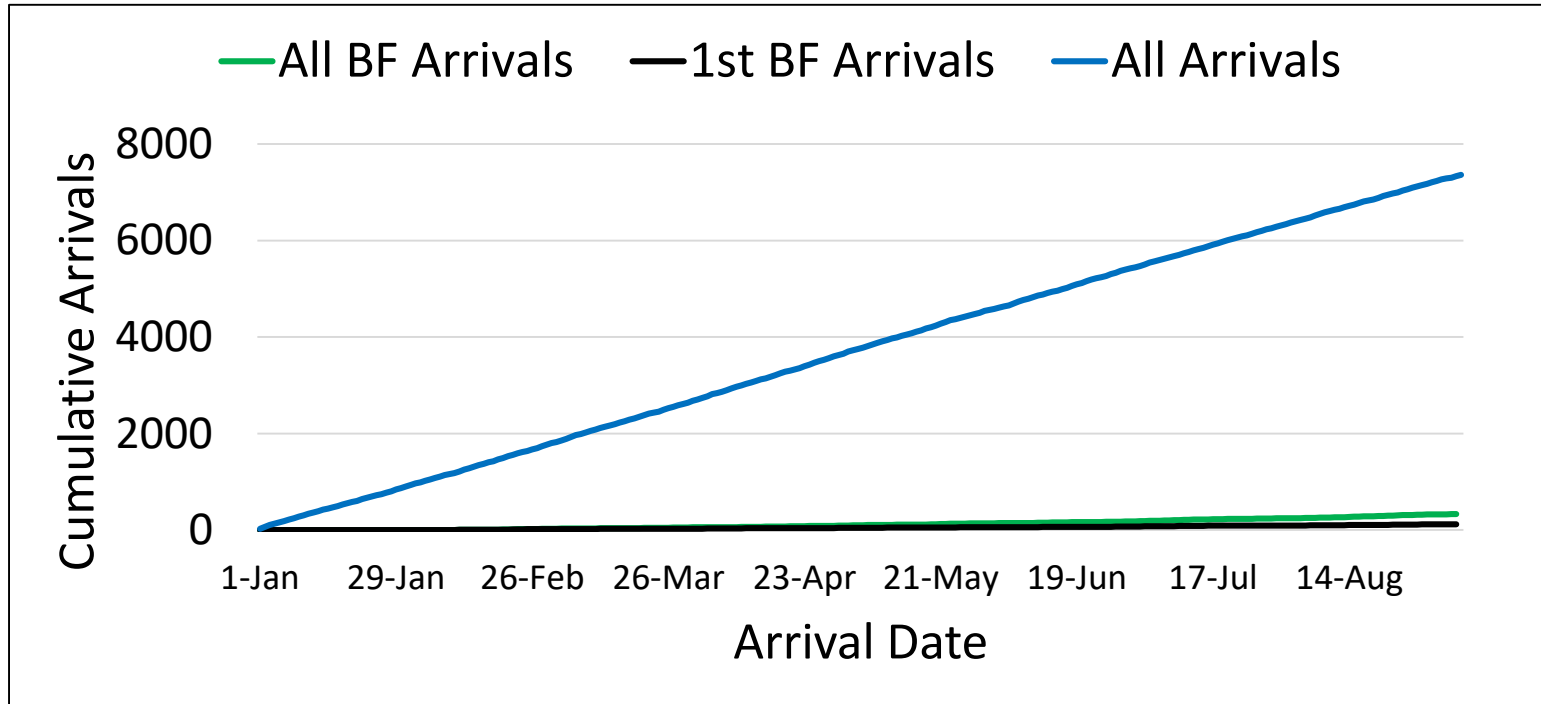
# Implementation



# Implementation



# Implementation



# Inspection and Enforcement

## Prioritization

- Initially: All BF vessels – 1<sup>st</sup> arrival
  - Outreach!
- Soon: Weighted risk assessment (based on Annual Vessel Reporting Form)
  - + or – risk scores
  - High Risk
  - Medium Risk
  - Low Risk
  - No Priority



# Inspections and Enforcement

## Inspections

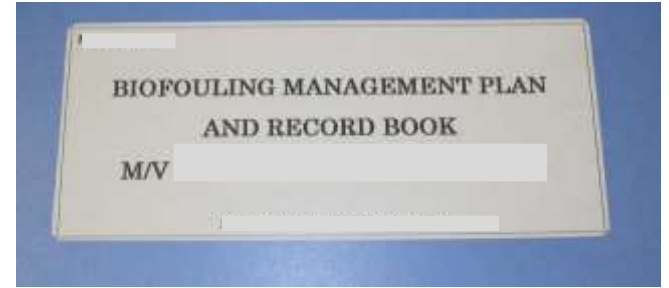
- Focused on Biofouling Management Plan and Biofouling Record Book
- Outreach
- Assess industry knowledge
- 60-day grace periods



# Inspections and Enforcement

## (Very) Preliminary trends

- 35 biofouling inspections in August 2018
- 20 grace periods issued during first 6 weeks
  - Most common deficiencies:
    - Niche area management description
    - Effective coating lifespan
  - Less common deficiencies
    - No Biofouling Management Plan (x3)
    - No Biofouling Record Book (x3)





# Lessons Learned

- Weighted risk assessments

Risk Tier	% of BF Vessels
High	5.9
Med	6.5
Low	16.3
No priority	68.0

- Future goals
  - Weighted RA vs categorical waterline assessment (Clean/Green/Animals)
    - So far, all Clean (all just out of dry dock or delivered)
    - So far, all inspected vessels were low/no priority
  - Weighted RA vs 60-day grace periods or violations
    - So far, all inspected vessels were low/no priority

# Lessons Learned

- Areas for improvement
  - Where are the knowledge gaps?
  - Effective coating lifespan

Messrs. [REDACTED] July 2018

**EXPECTED EFFECTIVE COATING LIFESPAN OF THE VESSEL'S Antifouling Paint**

The Lifespan of this ship's bottom Antifouling paint will be 30 months.

Vessel	: MV [REDACTED]
Owner	: [REDACTED] (IMO [REDACTED])
Life span	: 30 months
Last Dry dock	: April 2018
Anti-fouling paint(s)	: [REDACTED]

Vessel Specific?

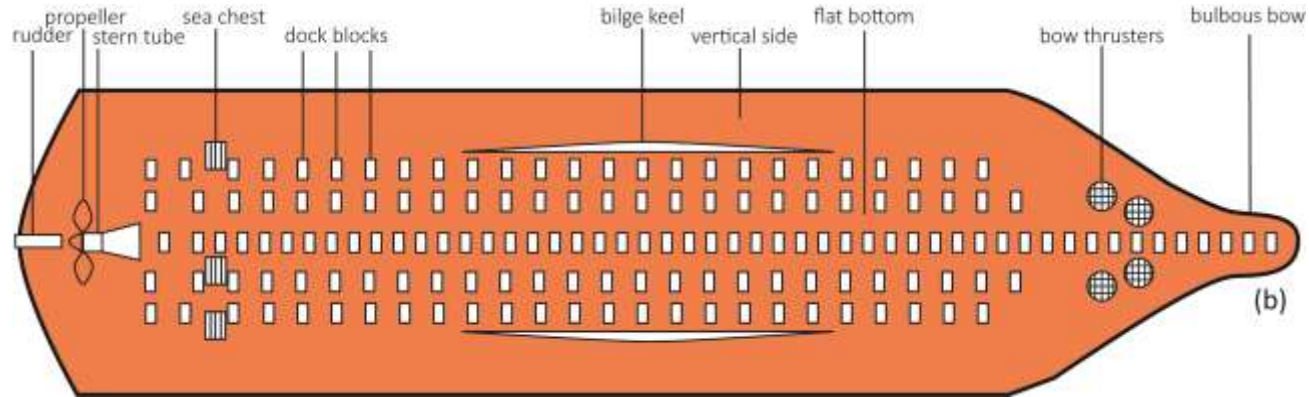
Dry-film thickness?

36 months?

60 months?

# Lessons Learned

- Areas for improvement
  - Where are the knowledge gaps?
    - Effective coating lifespan
    - Out-of-water support strips



Davidson et al. 2016 [Biofouling 32(4): 411-428]

# Lessons Learned

- Areas for improvement
  - Where are the knowledge gaps?
    - Expected coating lifespan
    - Out-of-water support strips
  - Follow-up with targeted outreach
- Learning process: industry and regulators



# Lessons Learned

- Different paradigm than ballast water
  - Ballast Water:
    - Crew is responsible for BW Management actions
  - Biofouling
    - Ownership/management is responsible for developing BF Management Plan





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# THANK YOU & QUESTIONS

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