



# Vessel Patterns in California Ports

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MARINE INVASIVE SPECIES PROGRAM

*Long Beach, CA | 26 Sept, 2018*

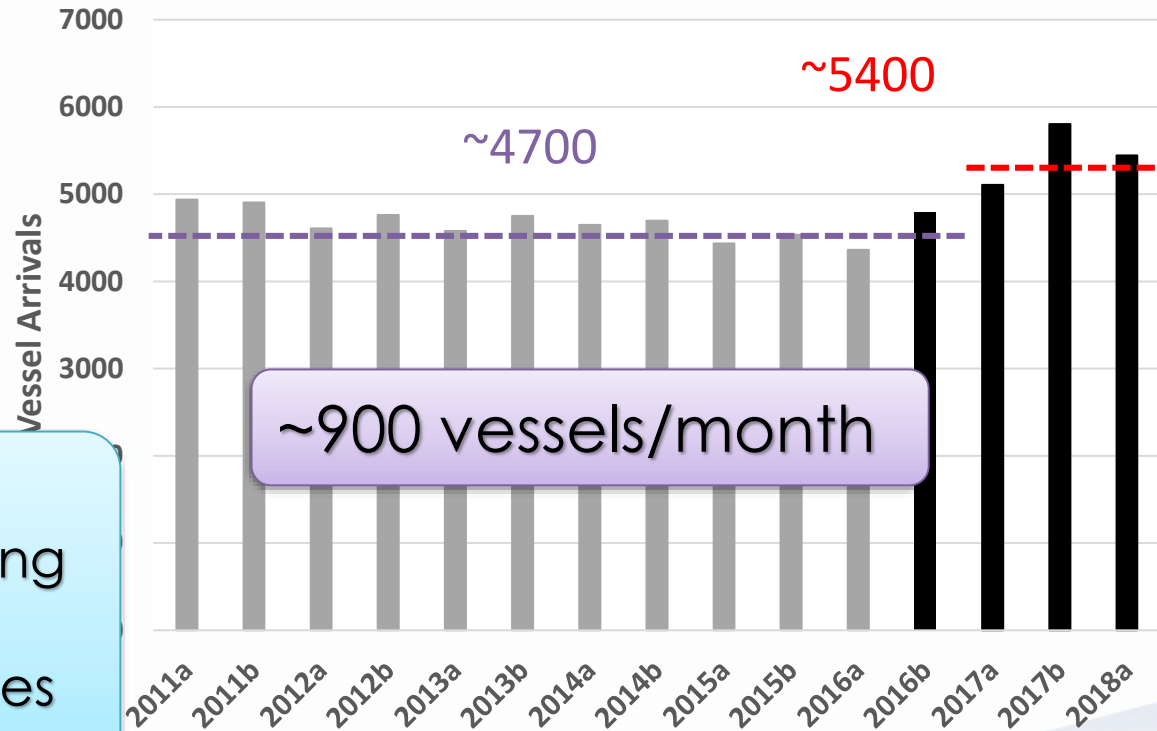


California State  
Lands Commission



1. **Vessel Arrivals at CA ports**
2. **Ballast Water Discharge Patterns**
  - Noncompliant discharges and water source
3. **Ballast Water Compliance and Enforcement**
4. **Biofouling - Wetted Surface Area**
5. **Questions?**

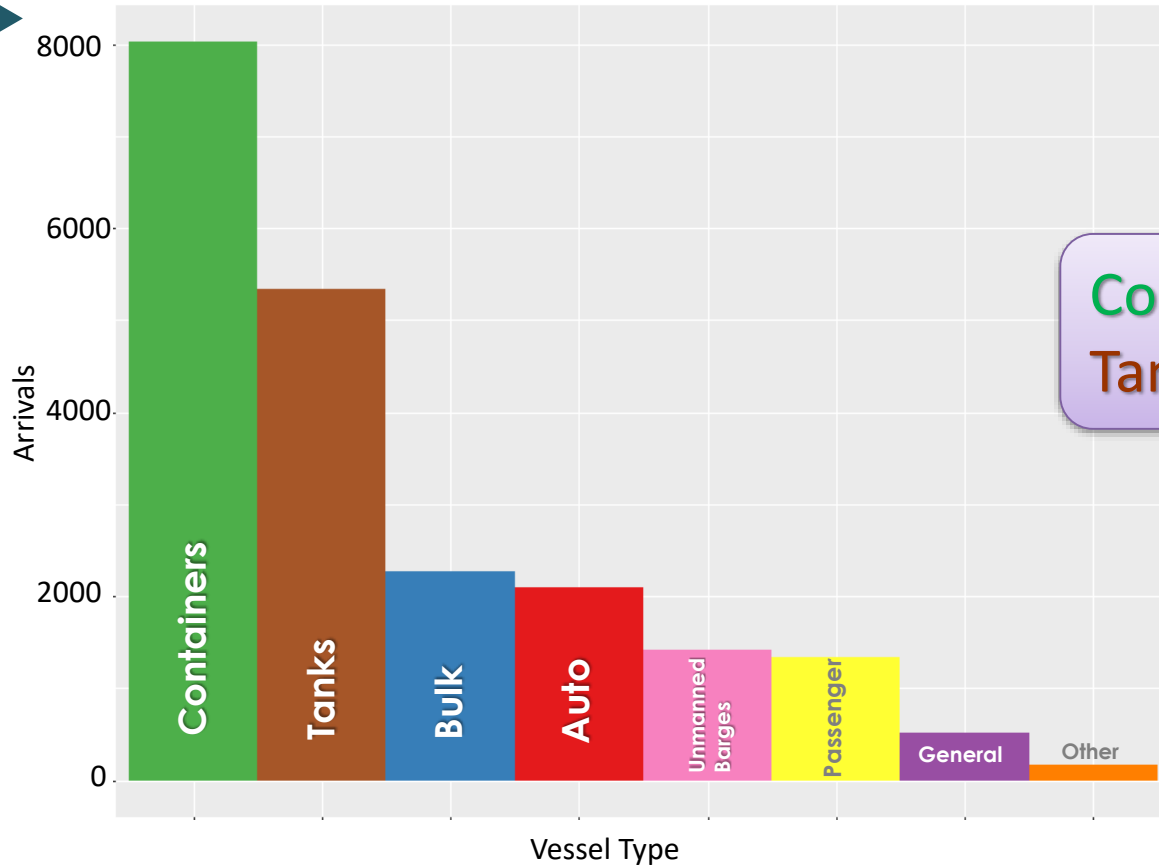
# Vessel Arrivals Over Time



14% increase -  
Change in reporting  
requirements  
counts anchorages  
arrivals as unique

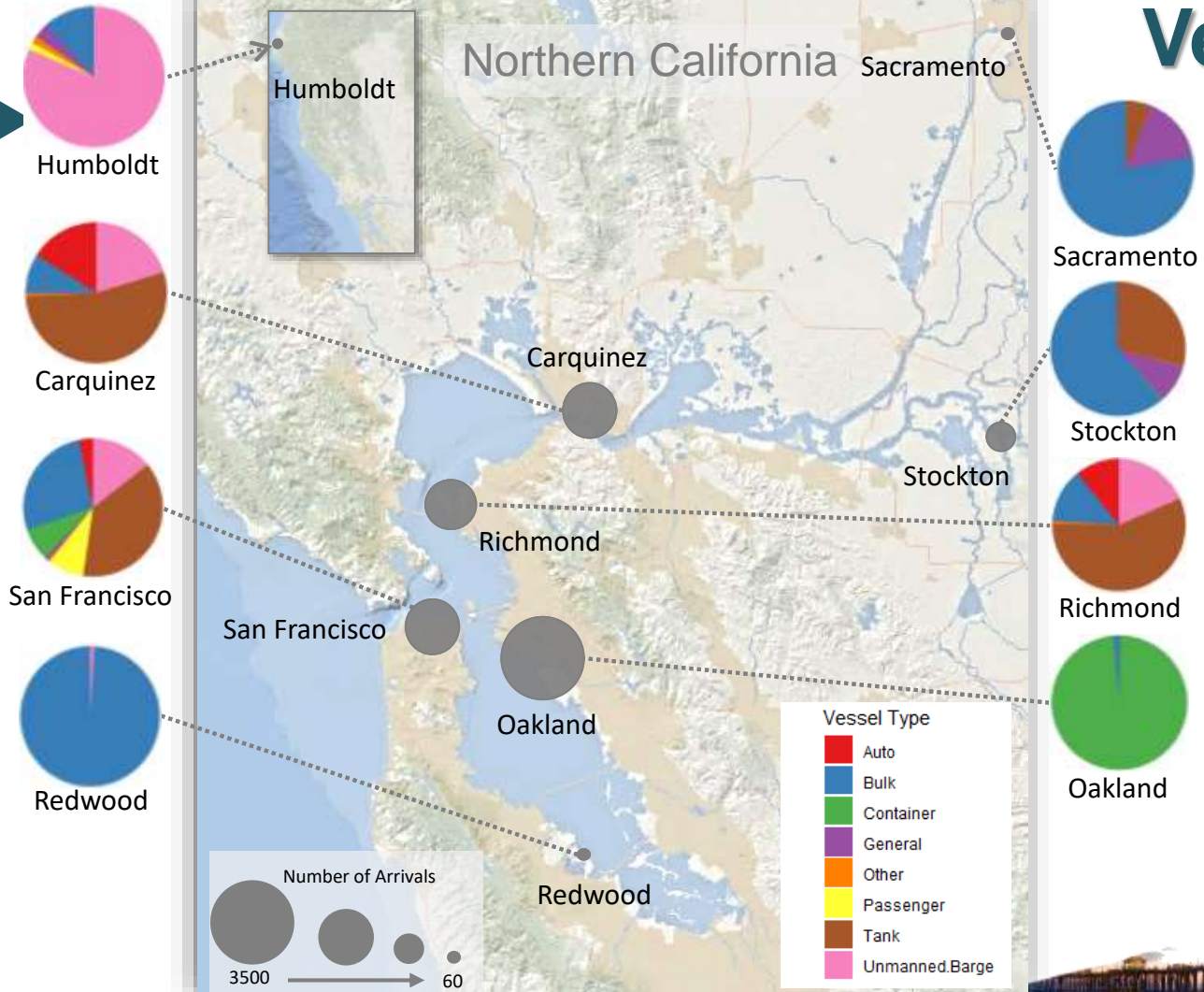
# Vessel Arrivals

BY VESSEL TYPE



Containers: 38%  
Tankers: 25%

# Vessel Arrivals



- Arrivals dominated by **Tankers** vs. **Bulk** vessels
- Most arrivals of **Containers** Oakland (35%)

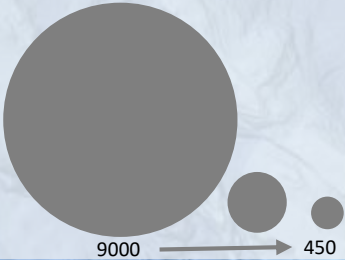


# Southern California

Avalon/  
Catalina  
Island



Number of Arrivals

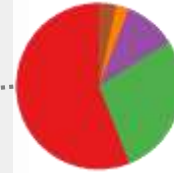


Vessel Type

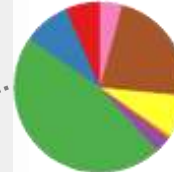


# Vessel Arrivals

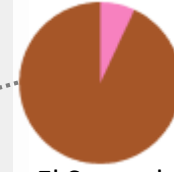
BY VESSEL TYPE



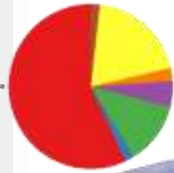
Hueneme



Los Angeles/  
Long Beach



El Segundo

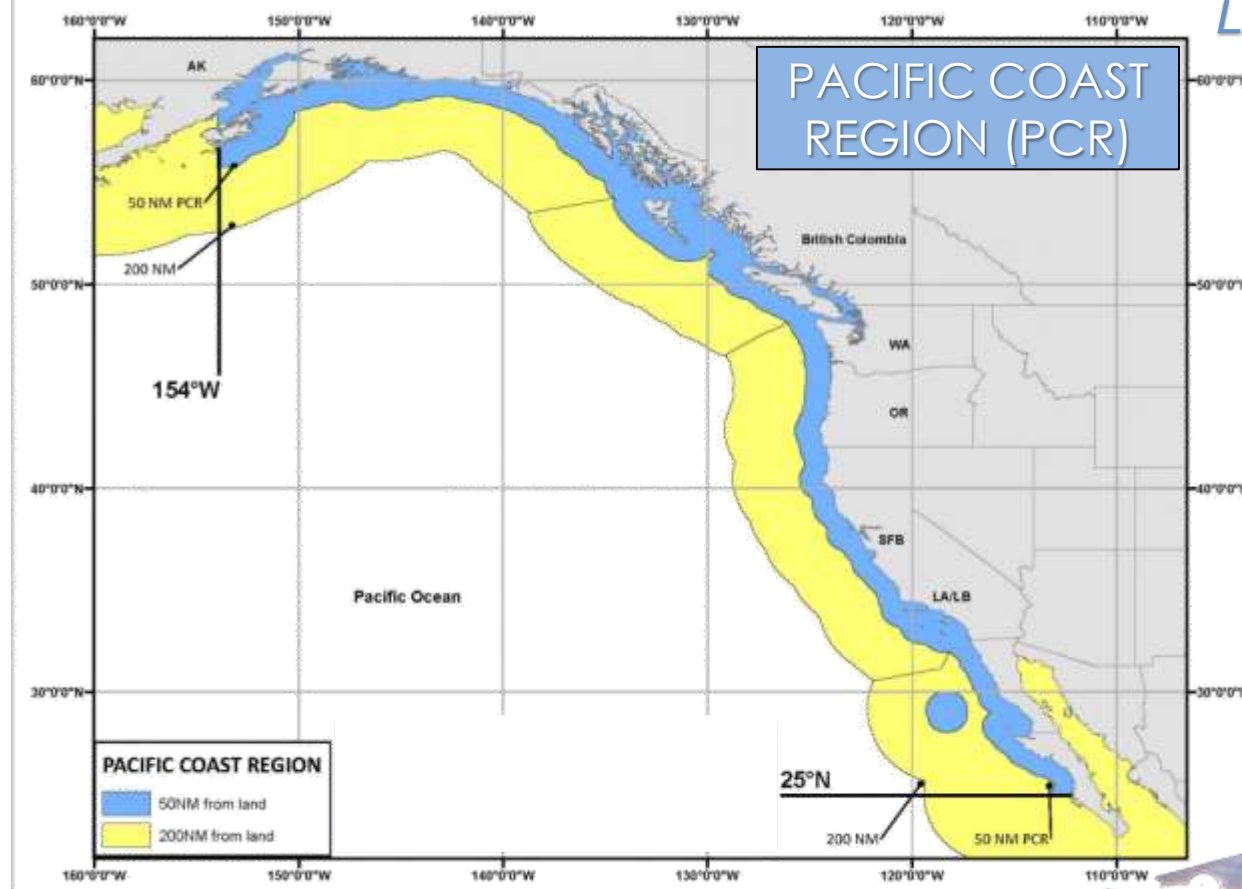


San Diego

Number of arrivals in LA/LB accounted for 79% Southern CA

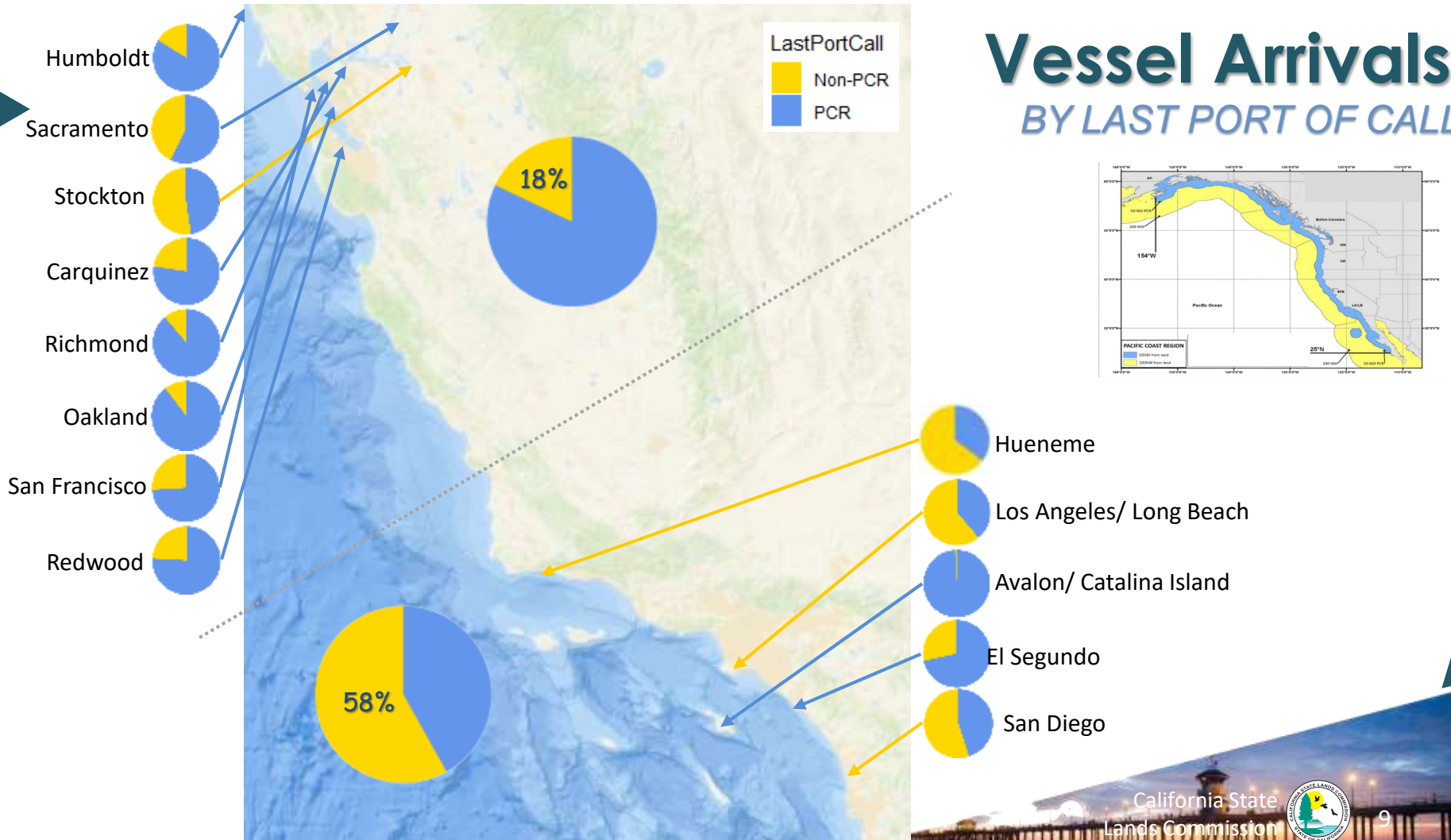
# Vessel Arrivals

LAST PORT OF CALL



# Vessel Arrivals

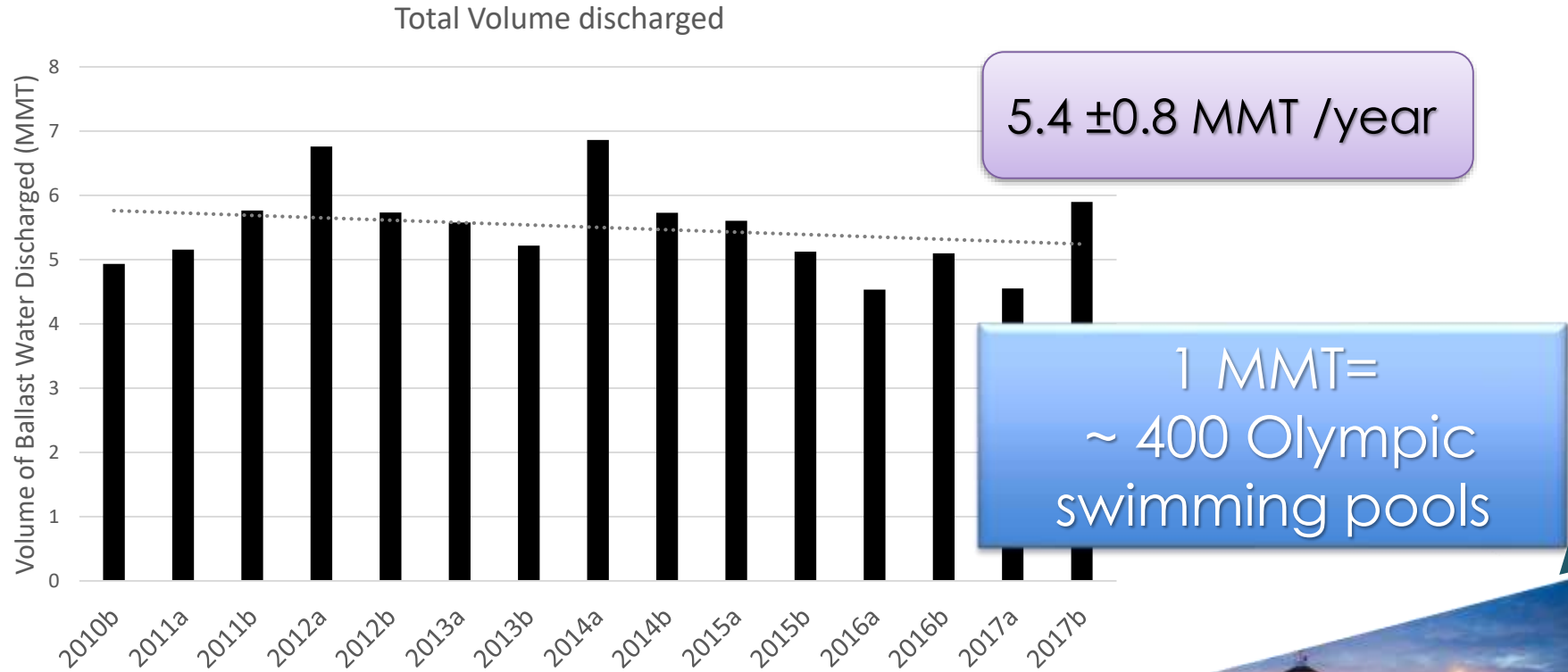
## BY LAST PORT OF CALL





1. Vessel Arrival Patterns at CA ports
- 2. Ballast Water Discharge Patterns**
  - Noncompliant discharges
  - Noncompliant water source
3. BW Compliance and Enforcement
4. Wetted Surface Area
5. Questions?

# 2. Ballast Water Discharge Patterns



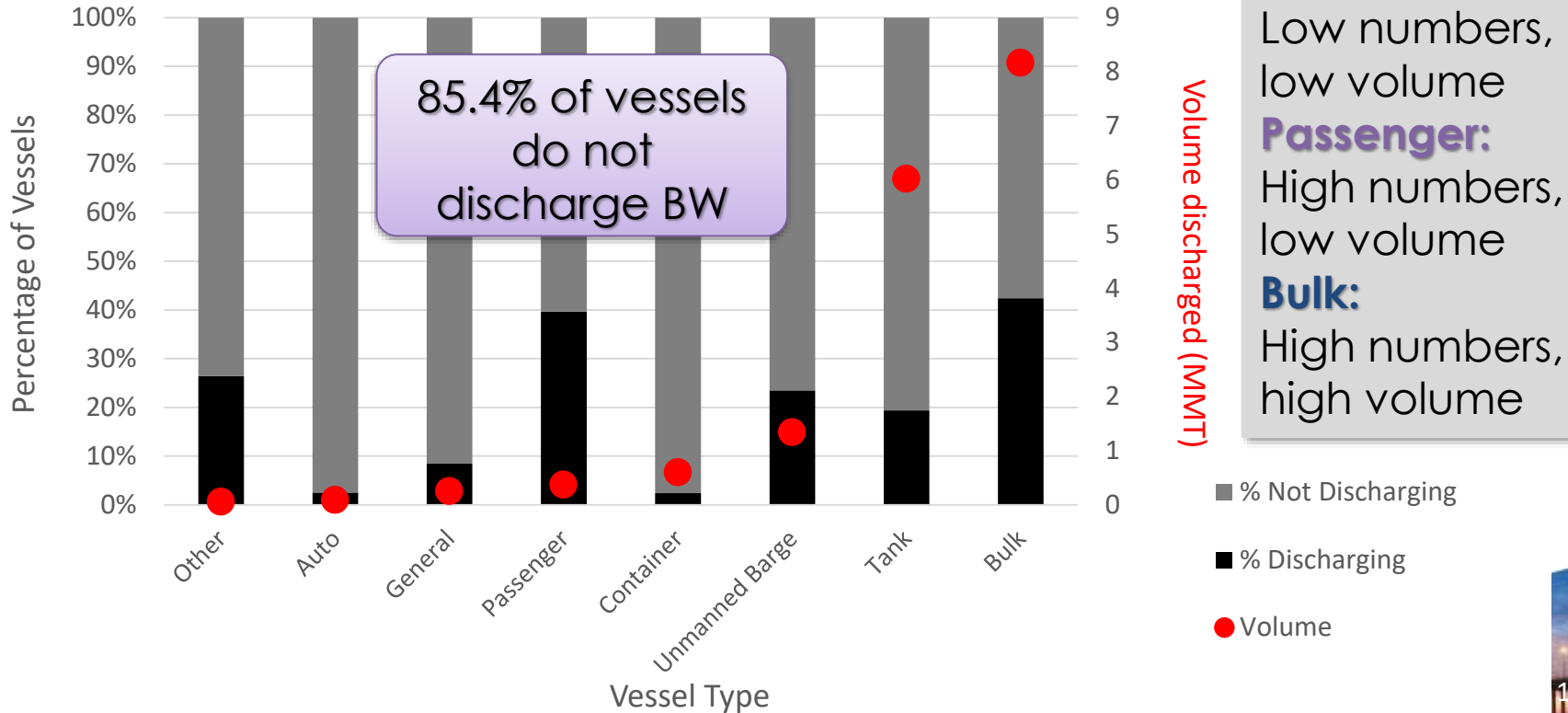


# BW Management Options:

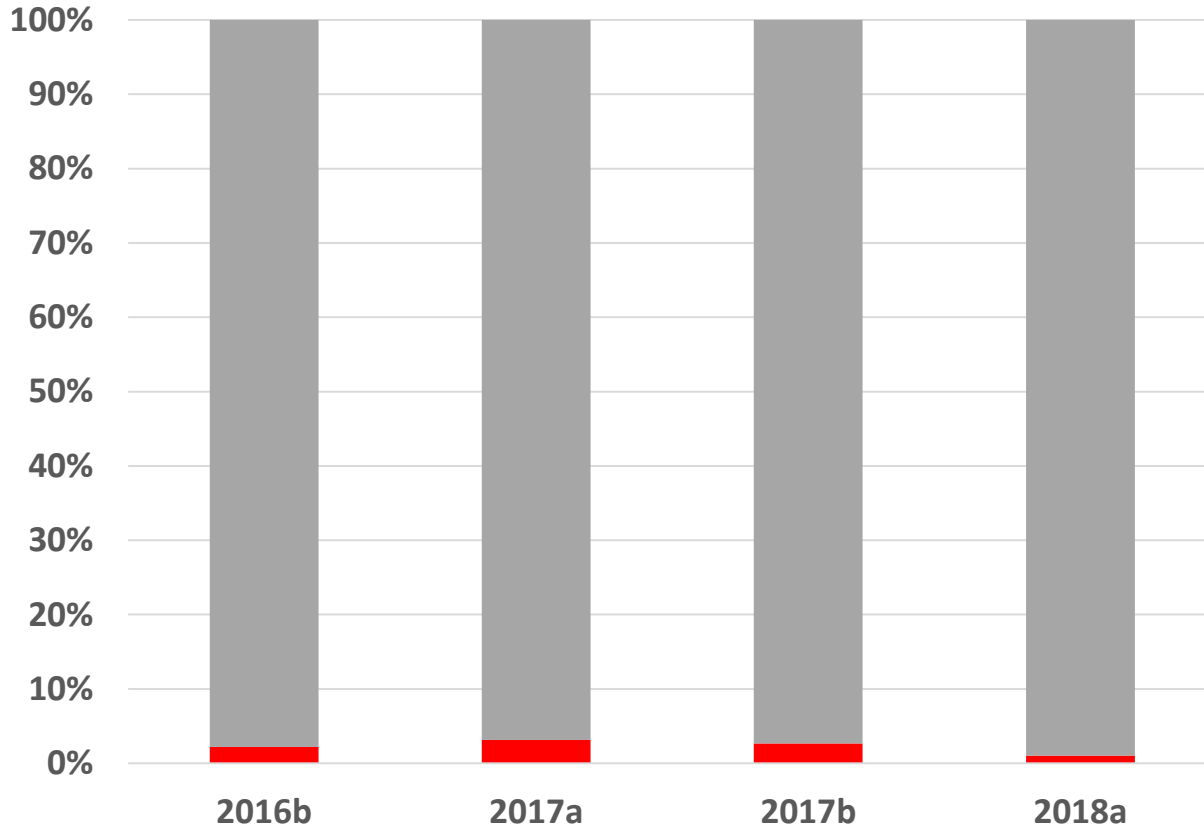
- Retention
- Ballast Water Exchange (location determined by Last Port of Call and ballast source)
- Alternative BW management method
- Discharge to shore-based facility (not available in CA)

# Discharging vs. Not Discharging

(July 2016 to March 2018 - 21 months)



# Noncompliant discharges



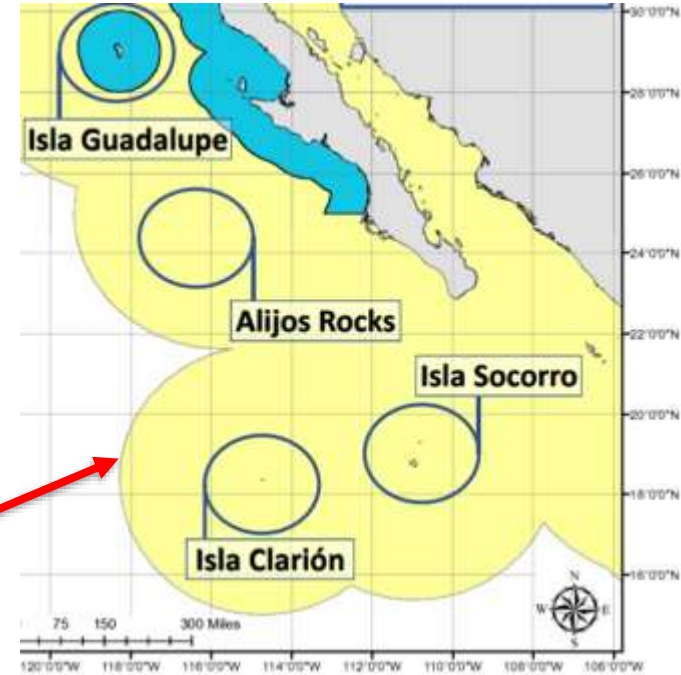
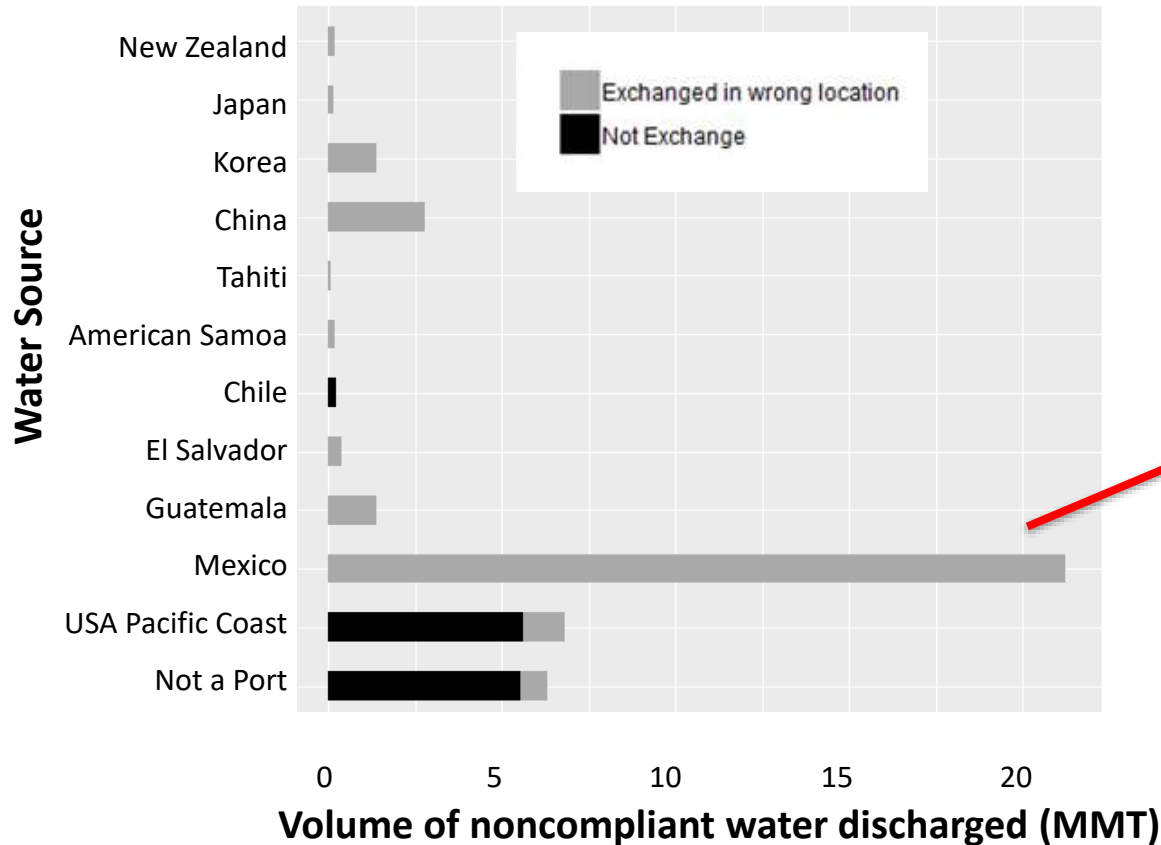
~2.4% discharged water is noncompliant

From 2012-2014 was >10%

- Noncompliant
- Compliant



# Where noncompliant water comes from?





Each ballast water discharge event has the potential to release over

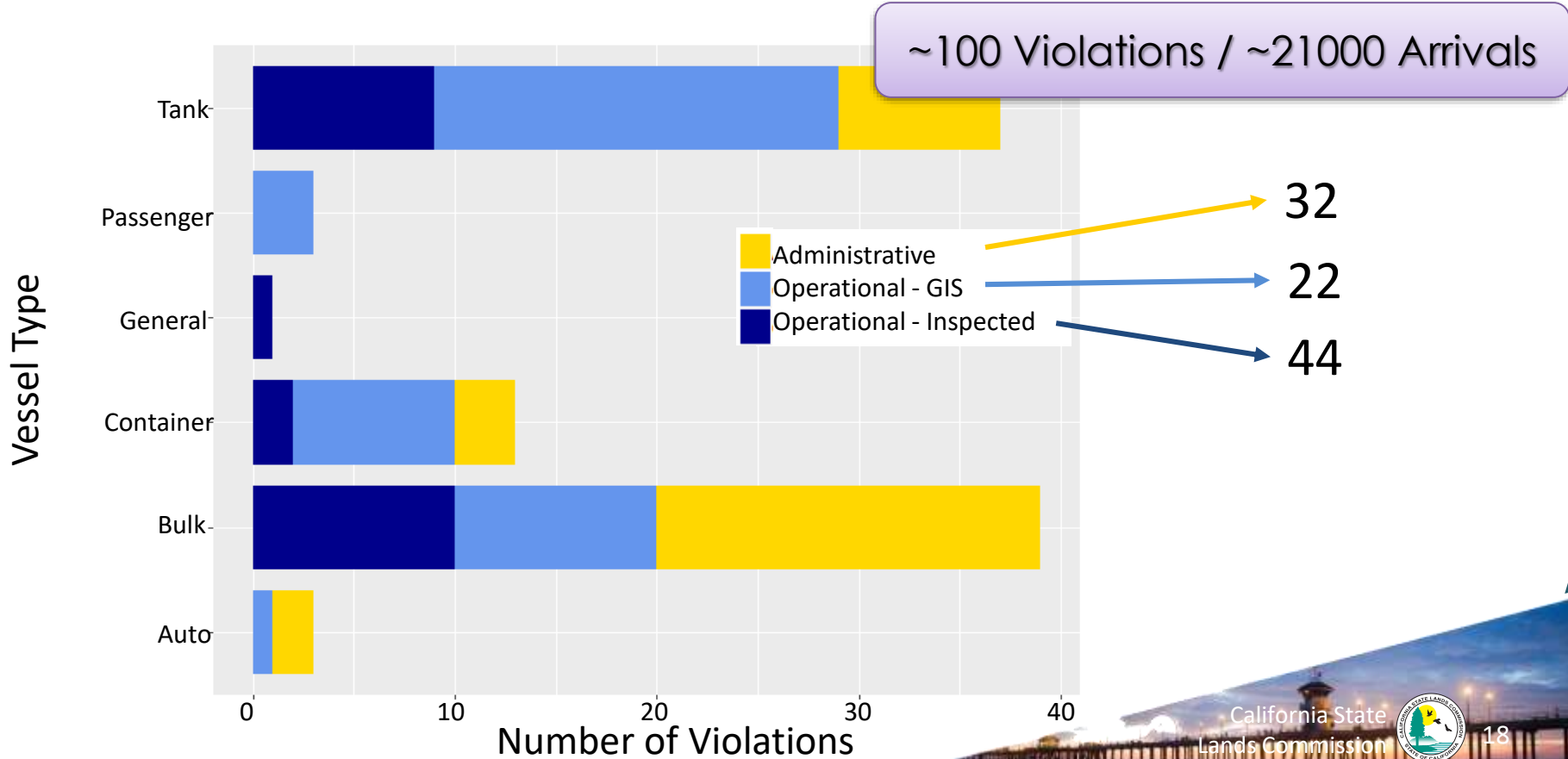
**21.2 million individual organisms**

(Minton et al. 2005)



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- 3. Ballast Water Compliance and Enforcement**
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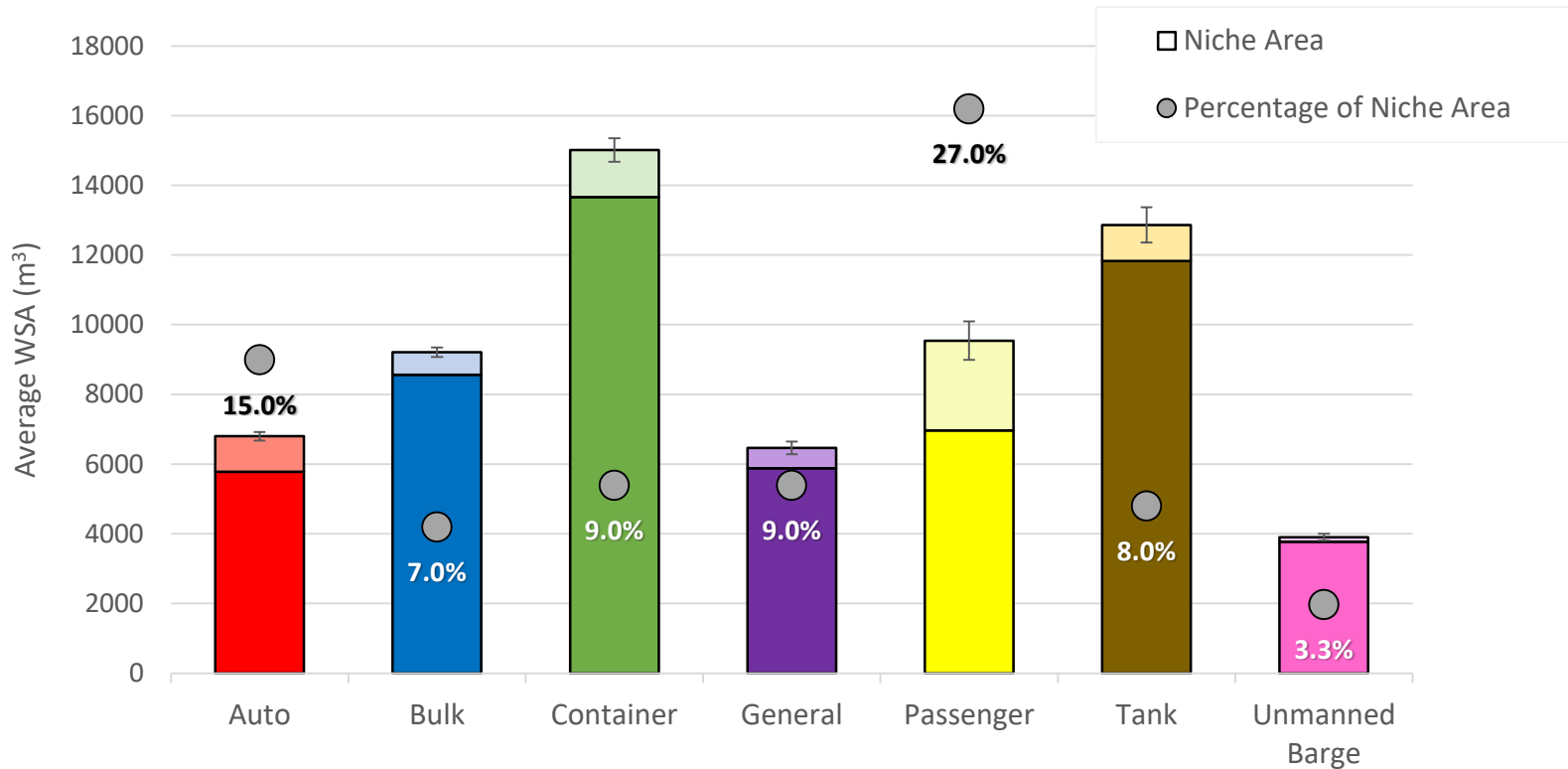
# 3. Compliance and Enforcement



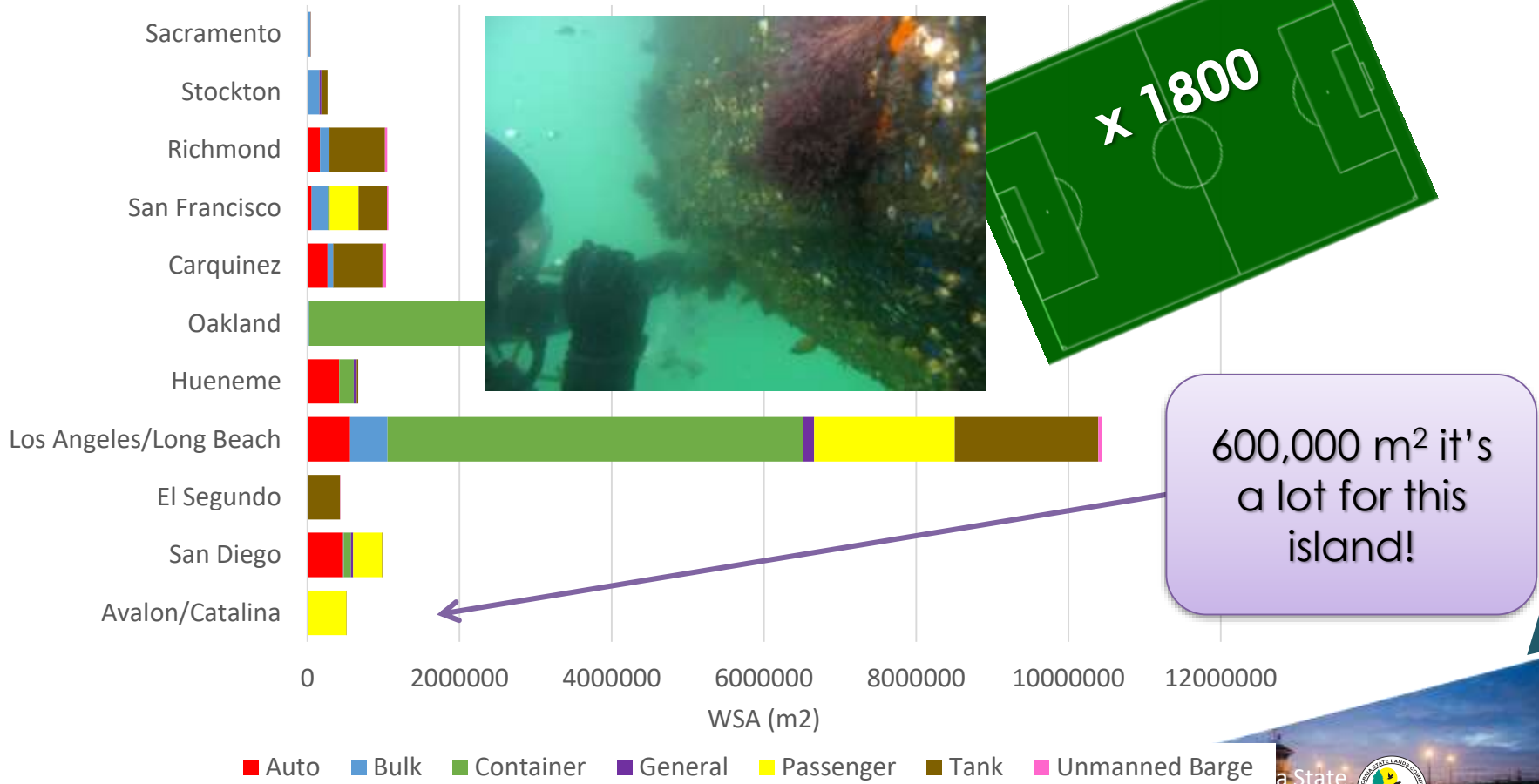
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# Wetted Surface Area - Biofouling

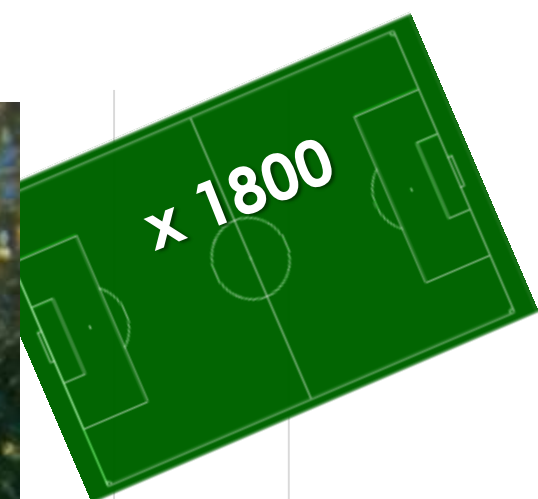


# Accumulated Niche WSA by Port



■ Auto 
 ■ Bulk 
 ■ Container 
 ■ General 
 ■ Passenger 
 ■ Tank 
 ■ Unmanned Barge

600,000 m² it's a lot for this island!



# SUMMARY

- Containers (38%) and Tankers (25%) dominate arrivals in CA
- 41% come from outside the PCR
- LA/LB receives 79% of South CA and 48% of all CA arrivals
- 5.4 MMT BW discharge / year, <15% vessels discharge BW
- Only 2.4% of BW discharged was noncompliant (much less than previous yrs)
- Passenger vessels have the highest percentage of niche areas (27%)
- LA/LB receives the highest accumulated WSA

www.slc.ca.gov

# THANK YOU & QUESTIONS

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California State  
Lands Commission



	Auto	Bulk	Container	General	Other	Passenger	Tank	Unmanned Barge	Grand Total
Alameda					3				3
Avalon/Catalina					4	221	1		226
Carquinez	286	160	2	6	10		964	363	1791
El Segundo							443	33	476
Hueneme	461		230	84	20		28		823
Humboldt		7		2	1	1		48	59
LA/LB	597	826	4292	287	55	743	2068	393	9261
Marina Del Rey					3				3
Monterey						8			8
Morro Bay					1				1
Moss Landing					21				21
Newport Beach					1				1
Oakland		51	3245	1			3	2	3302
Redwood		101						1	102
Richmond	183	224		2	11		962	312	1694
Sacramento		78		16			6		100
San Diego	512	17	109	46	23	176	16		899
San Francisco	60	496	141	17	7	155	697	263	1836
Santa Barbara	2					35			37
Stockton	1	309	2	47	1		147		507
Grand Total	2102	2269	8021	508	161	1339	5335	1415	21150





