



# JCOS SUSTAINABILITY SESSION ON THE ENVIRONMENTAL IMPACTS OF CRUISE SHIPS AGENDA

October 16, 2024 at 6:00 PM

Mendenhall Valley Library/Zoom Webinar

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<https://juneau.zoom.us/j/88069534778> or Phone 1-253-215-8782 Meeting ID: 880 6953 4778

## A. AGENDA TOPICS

### 1. Sustainability Impacts of Cruise Ships

ADA accommodations available upon request: Please contact the Clerk's office 36 hours prior to any meeting so arrangements can be made for closed captioning or sign language interpreter services depending on the meeting format. The Clerk's office telephone number is 586-5278, TDD 586-5351, e-mail: [city.clerk@juneau.gov](mailto:city.clerk@juneau.gov).

Juneau Commission  
on Sustainability Presents:

Sustainability Session:

# Sustainability Impacts of Cruise Ships

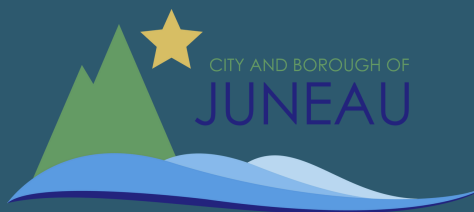
Presenters:

Alexandra Pierce  
Tourism Manager, CBJ

Ben Eisenstein  
Program Manager,  
ADEC Cruise Ship Program

Jim Powell, PhD  
University of Alaska Southeast,  
Alaska Coastal Rainforest Center

Ed White  
Former Manager,  
ADEC Cruise Ship Program



**OCT. 16, 2024**

**6:00-7:30 PM**  
**Mendenhall Valley**  
**Public Library**

Attend on Zoom  
or In-Person!



# Juneau Sustainability and Cruise Ships

Section A, Item 1.

**Jim Powell, Assistant Research Professor**

**Alaska Coastal Rainforest Center, University of Alaska Southeast**

**Ed White, Ship Pollution Consultant**



**Juneau Commission on Sustainability Commission  
October 16<sup>th</sup>, 2024**





# Presentation

- Sustainability Framework
- Environmental and Technical
- Social Perceptions – Neighborhoods, Surveys, and Hotlines

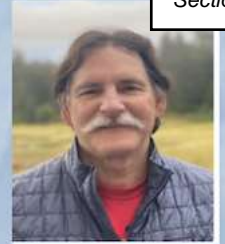


# Arctic Cruise Ship Research Team



**Robert Orttung, (PI) PhD**  
Political Science Research Professor  
George Washington University

**Jim Powell, (Co-PI) PhD**  
Assistant Research Professor  
Alaska Coastal Rainforest Center, UAS



**Sean Asiqluq Topkok, PhD (CO-PI)**  
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**Sheryl Elliott,** Associate Professor Emeritus School  
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George Washington University



**Joseph Little, PhD**  
Assistant Professor at Northern  
Arizona University & IARC Visiting  
Scholar, UAF

**Seleni Matus,** Dir. International Institute  
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Candidate, UAS

**Martin Miles**  
Research Scientist, IAAR  
NORCE, Bjerknes Centre for Climate  
Research,  
Bergen Norway, U. of Colorado-Boulder

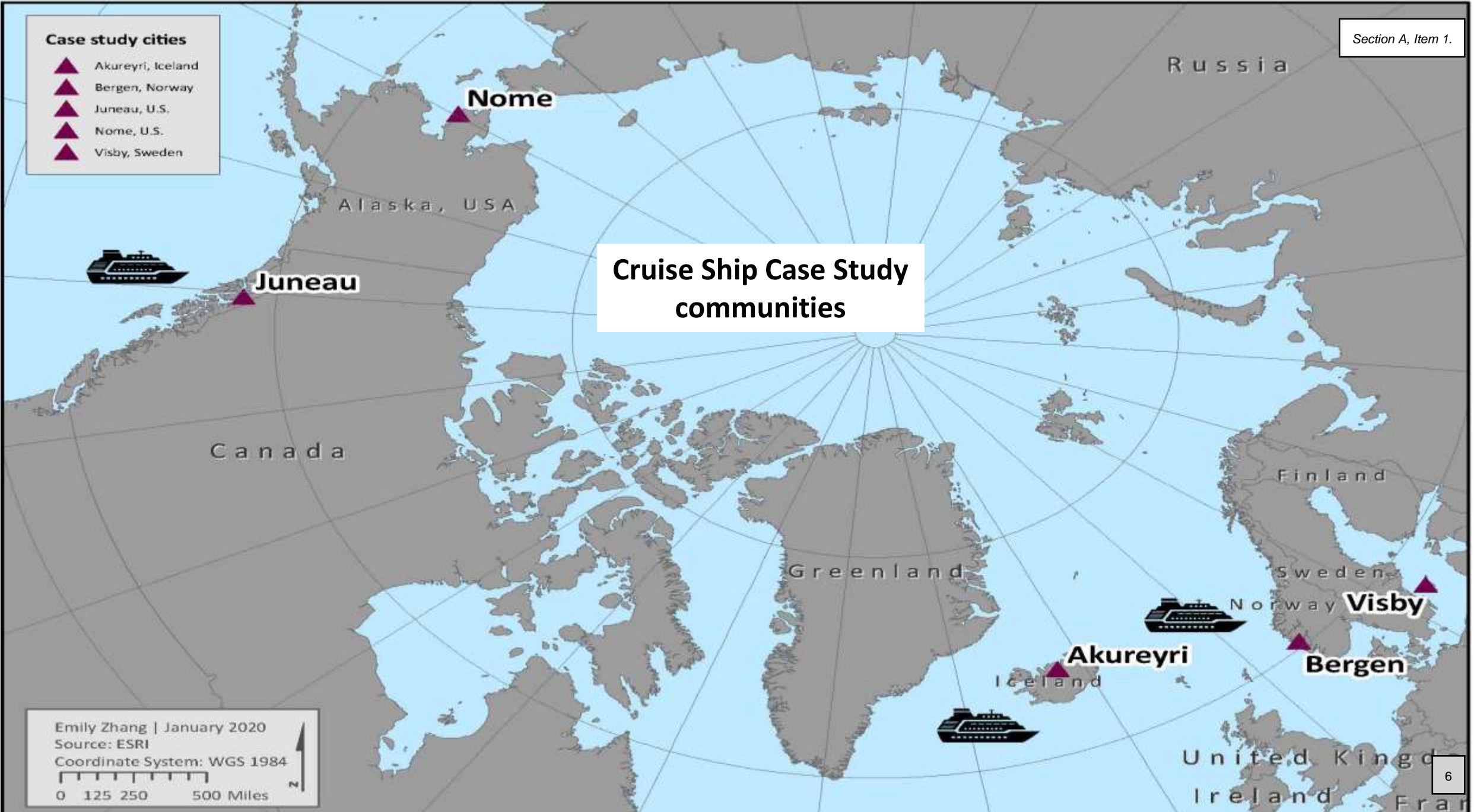




**Case study cities**

- ▲ Akureyri, Iceland
- ▲ Bergen, Norway
- ▲ Juneau, U.S.
- ▲ Nome, U.S.
- ▲ Visby, Sweden

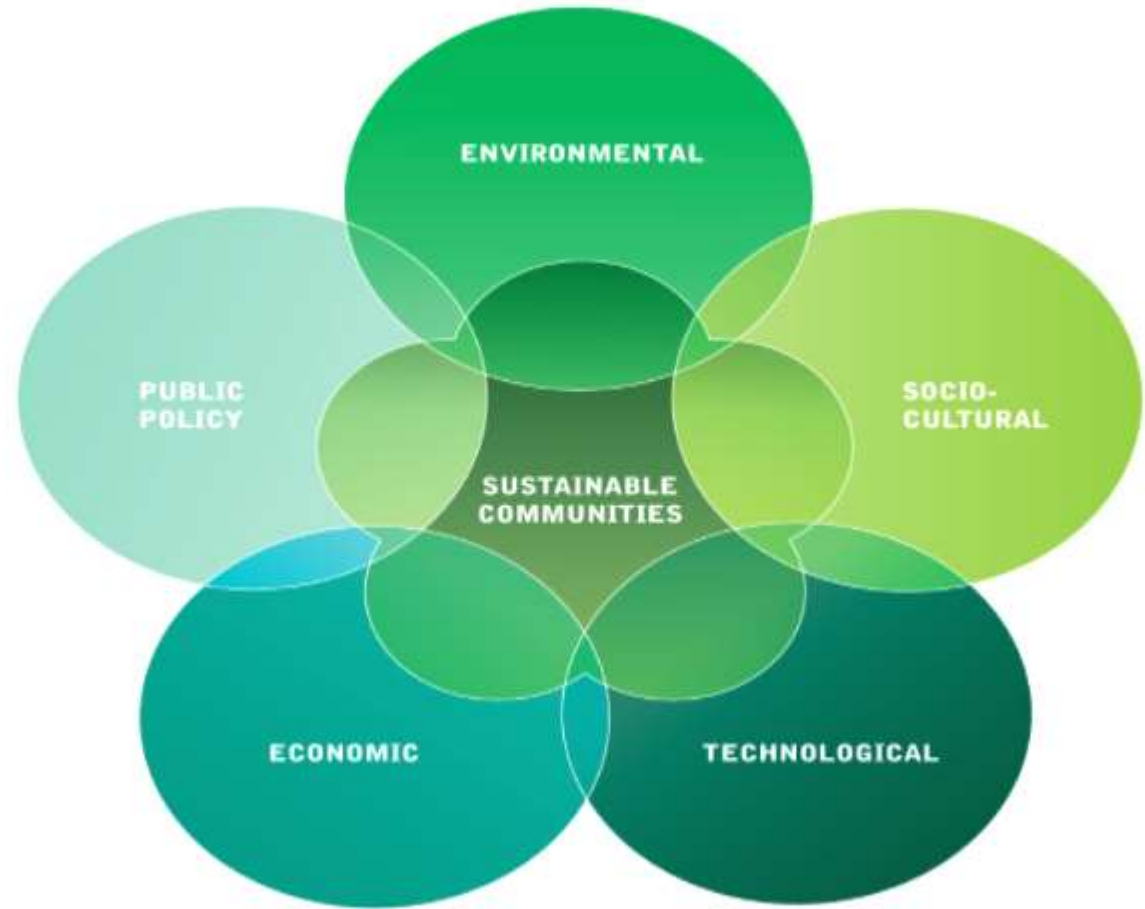
**Cruise Ship Case Study communities**



Emily Zhang | January 2020  
Source: ESRI  
Coordinate System: WGS 1984  
0 125 250 500 Miles

# Systems Approach to Sustainable Tourism

## Sustainometrics – Five Domains



Civic Engagement and Activities

Noise Complaints

Noise Complaints and Public meetings

Citizen info gathering on flight seeing

Citizen Public Form on Noise Flight Seeing

Citizen info gathering on flight seeing

ANB & ANS support cruise ship ballot

Responsible Cruising for Alaska Ballot Initiative

Long shore picketed Marine Park

NGOs - Center for Biological Diversity & Friends of the Earth

Global Cruise Activist Network

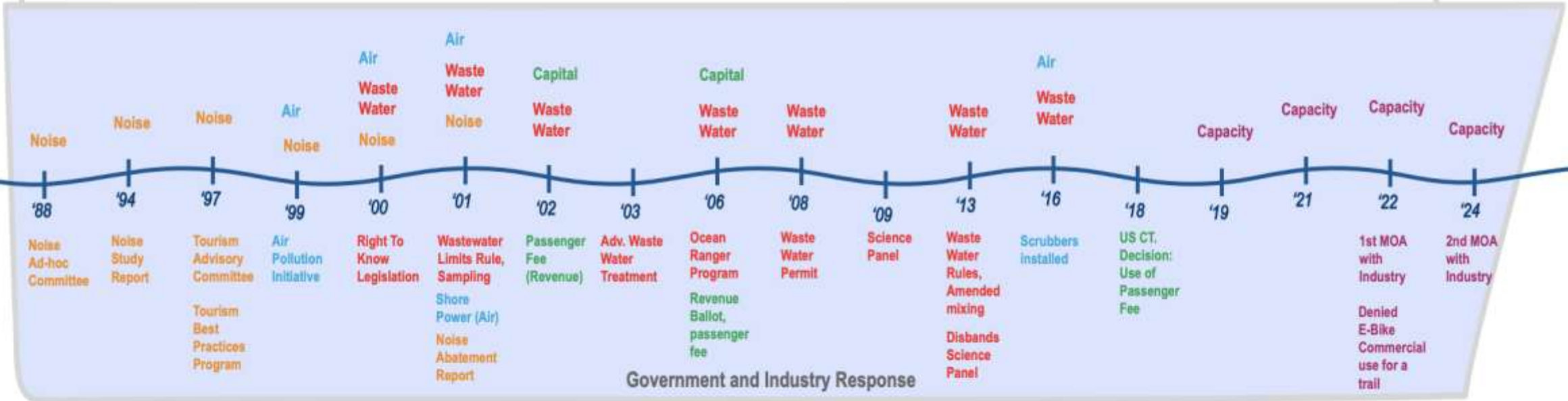
"Juneau Cruise Control" Failed Ballot, not enough signatures

"Juneau Cruise Control" collecting signatures for # of ships

Petition approved for Oct. Ballot on ship-less Saturday

Protect Juneau's Future

Juneau Cruise Control



Government and Industry Response

Noise ----- Air-----Right to know---Wastewater-----Revenue-----Capacity -----



# Cruise ship Environmental Practices & Controls

Impacts	Local	Regional / State	National	International
<b>Air</b>	<b>Best Practices (TBMP) 90</b> Hotline Shore Power	Air Quality Standards -Ship emissions -Buses Use emission scrubbers	Clean Air Act - standards	International Maritime Organization
<b>Wastewater</b>	Shore pump out	Water Quality Standards Water Discharge Permits Use advanced WW treatment (large ship)	Clean Water Act - Standards, Sewage, VIDA	International Maritime Organization
<b>Noise</b>	<b>Best Practices (TBMP) Studies</b> Rerouting helicopter/ fixed wing Technology		Fed. Aviation Adm.	IMO underwater noise in development
<b>Traffic</b>	<b>Best Practices (TBMP)</b>			
<b>Wildlife (Whales)</b>	<b>Best Practices (TBMP)</b> Whale SENSE (non-regulatory)		Nat. Ocean Atm. Adm. Distance 100 yards, 20 min (No limit on # of vessels)	

# Juneau's Cruise Ship Environmental Mgt

## Air and Water

### State/Fed

- Plug in shore power,
- 1<sup>st</sup> Waste Water Discharge Law
- Green Corridor



## Visitors

- CBJ & Industry
- MOA – 1 of 4 Globally
- Over 90 TBMPs
- Hotline

## Noise

- Technology – Quieter planes downtown
- helicopter routing

## Whales

- NOAA - 100 yds & < 20 minutes
- Charters – 2024 Practices
- 19 Tourism Mgt. Best Practices





# Cruise Ship Potential Environmental Impacts

Air Emissions

Wastewaters

Invasive Species

Solid Wastes & Hazardous Materials

Fuels and oils

Indirect from passengers

Other- light, noise, disturbance of wildlife

# Environment and Technology

## Air and Water- some generalizations

### **Alaska**

- Performance based
- Discharges and emissions
- Water/air quality, human health
- Compliance
- Focus on cruise ship sewage, greywater, air emissions opacity

### **Outside Alaska**

- Certification focused
- Equipment and fuels
- Best available technology
- Incentives and fees
- Focus on greenhouse gases and air pollutants (oxides) from all ships, ballast water



# Alaska Passenger Vessel Wastewater

Approval needed to discharge sewage and gray water (permit needed 250 or more berths)

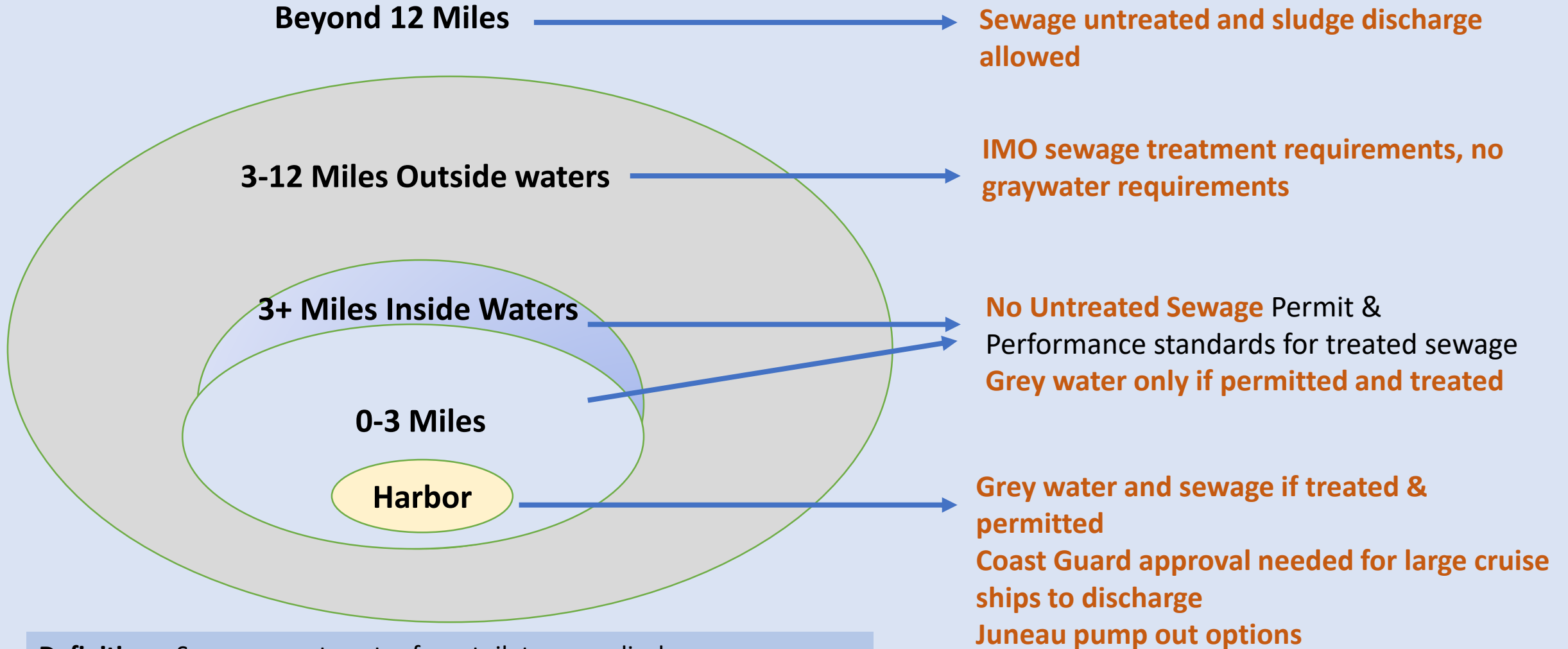
Sampling required if discharging

Sampling plans, required records

Inspections, Ocean Rangers (2007-2019), enforcement

Improvement in treatment documented

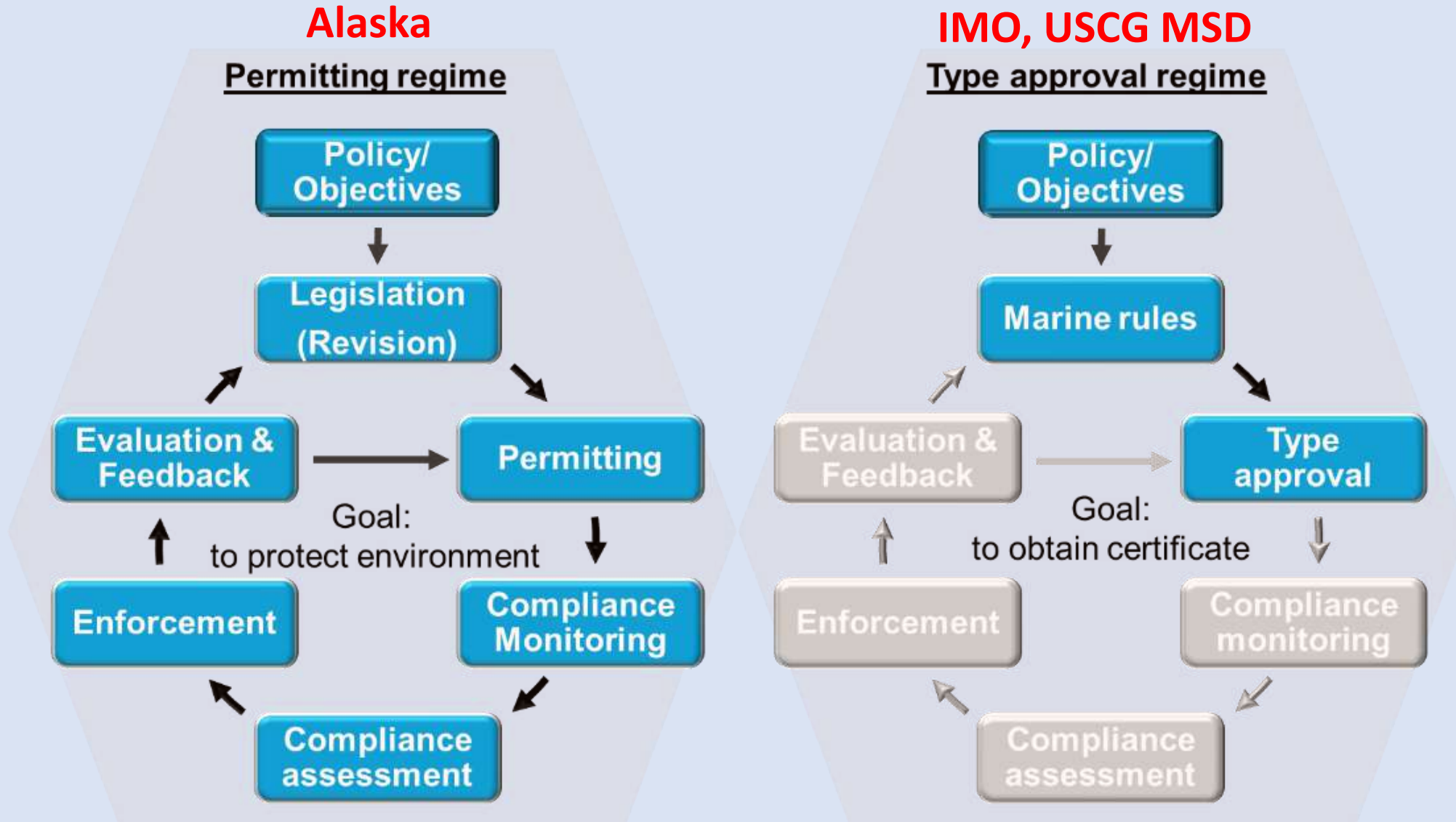
# Alaska Cruise Ship Wastewater Rules and Regulations



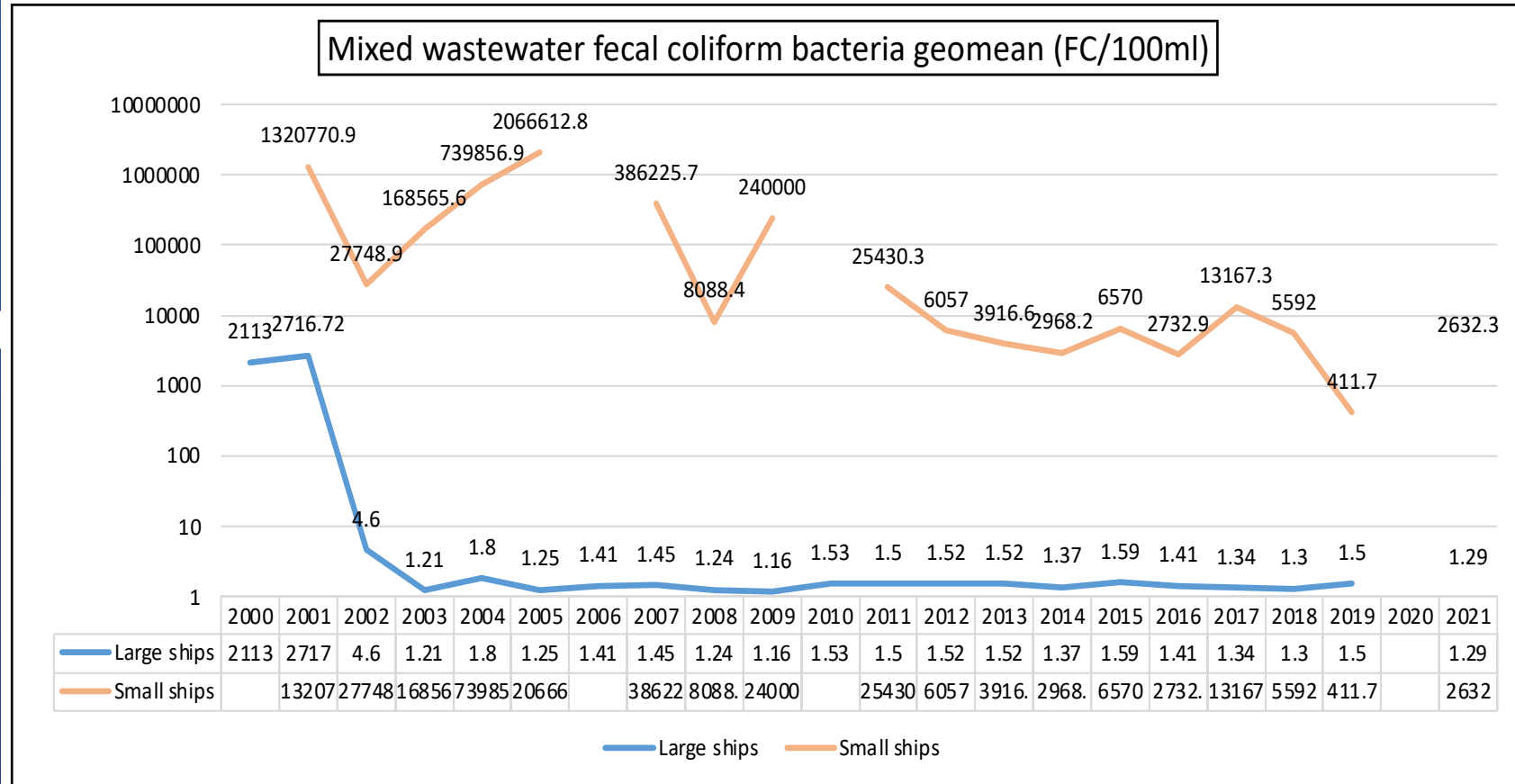
**Definitions:** Sewage- wastewater from toilets or medical spaces.  
Greywater – wastewater from human uses – sinks, kitchens, showers etc.  
Miles are Nautical Miles



# Alaska wastewater compared with international

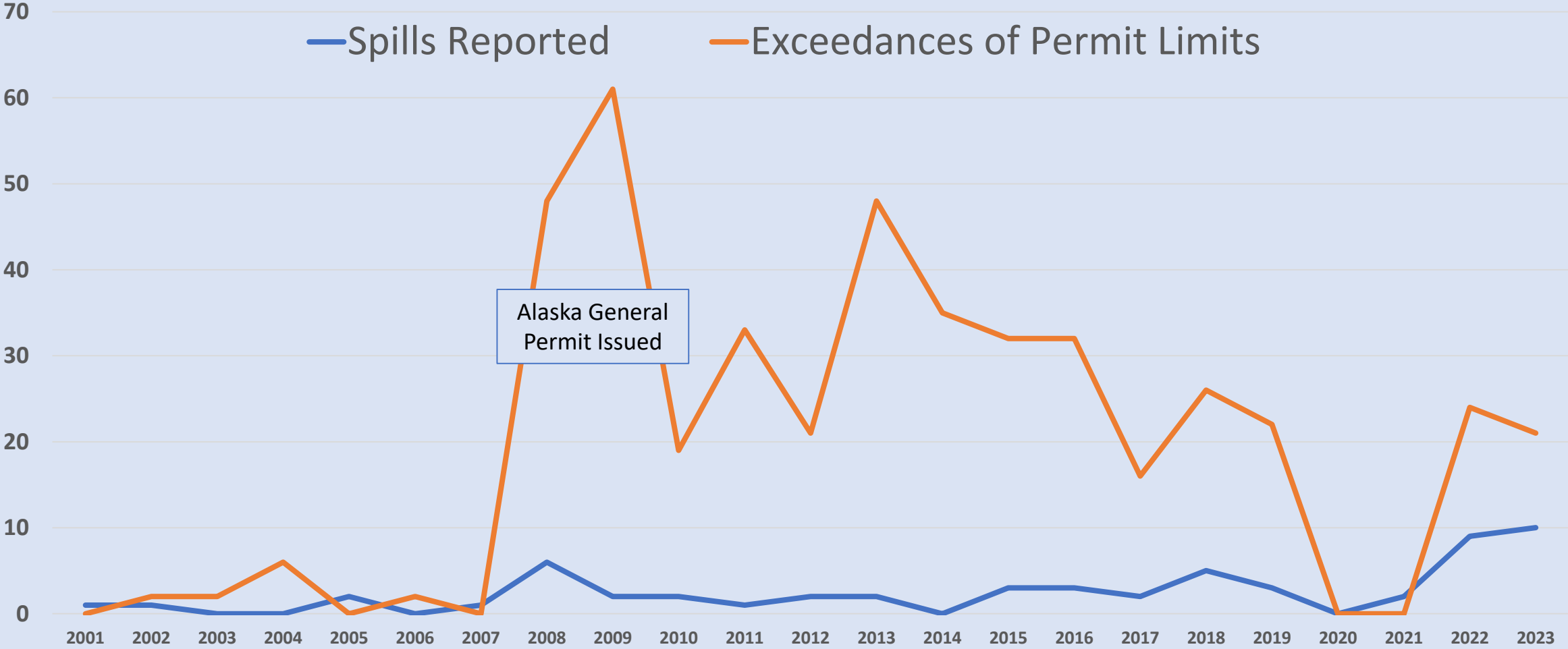


# Alaska Passenger Vessel Treated Sewage Bacteria





# Compliance Assessment (Alaska wastewater)





Burning of fuel for propulsion and electricity generation

Incinerator use, boilers for heat

Emissions contain gases, particulates, acids

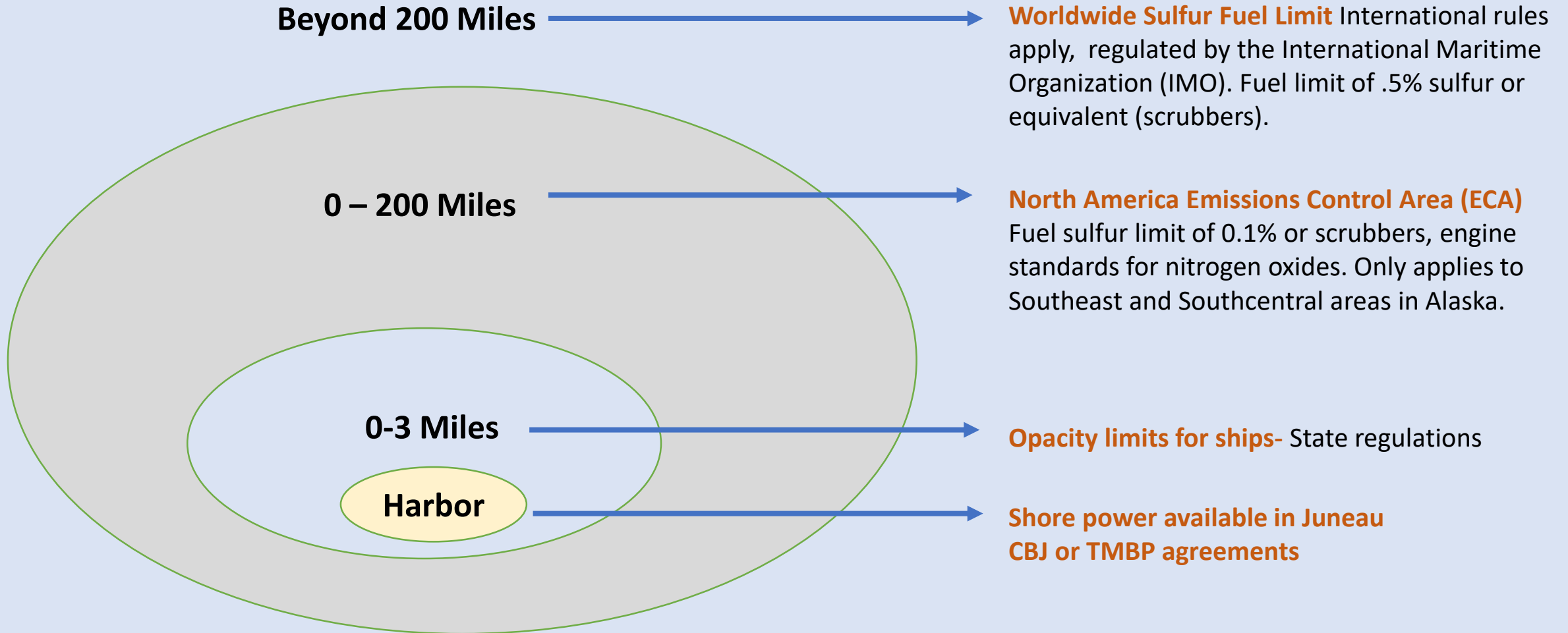


Cruise Ship Opacity - Juneau Mid-summer 1972 Ron Flinn, ADEC-SEP

# Air Emissions

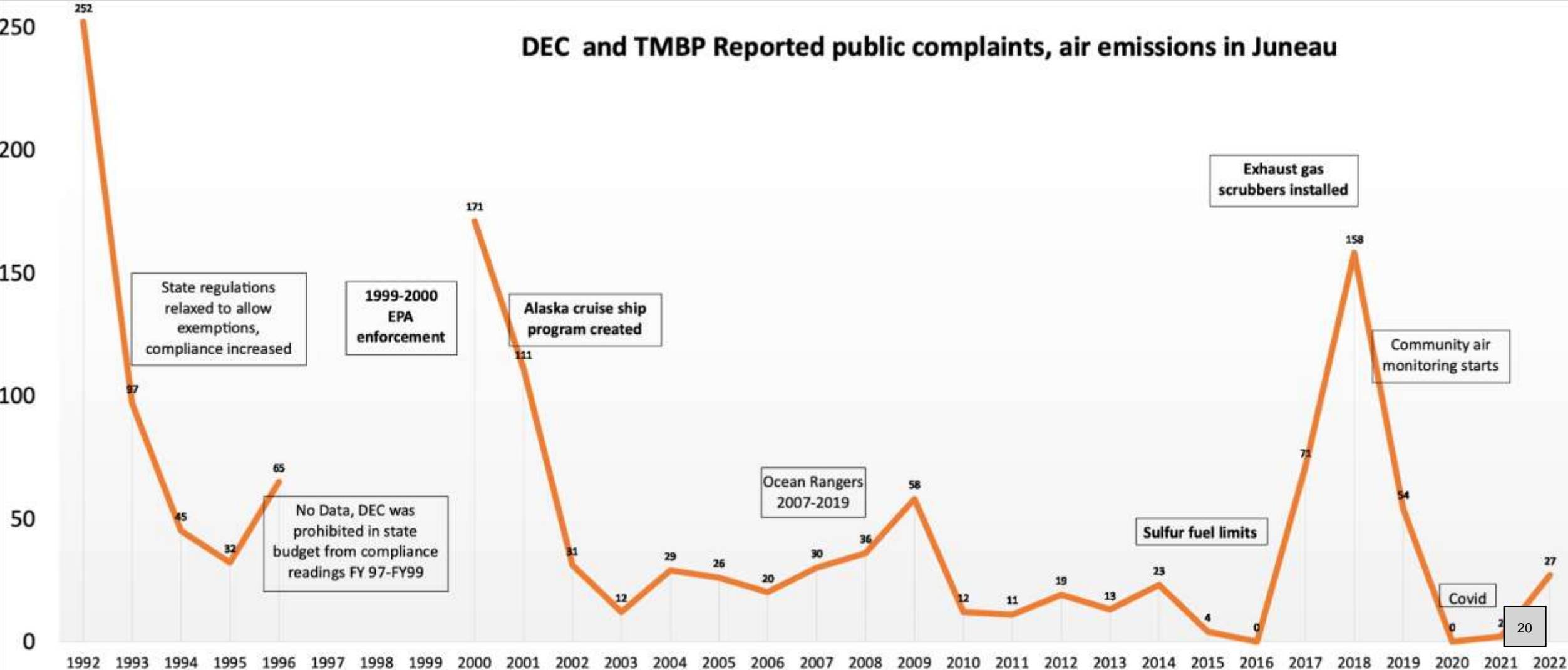


# Alaska Cruise Ship Air Emissions Rules and Regulations



# Public complaints- Juneau Air

### DEC and TMBP Reported public complaints, air emissions in Juneau





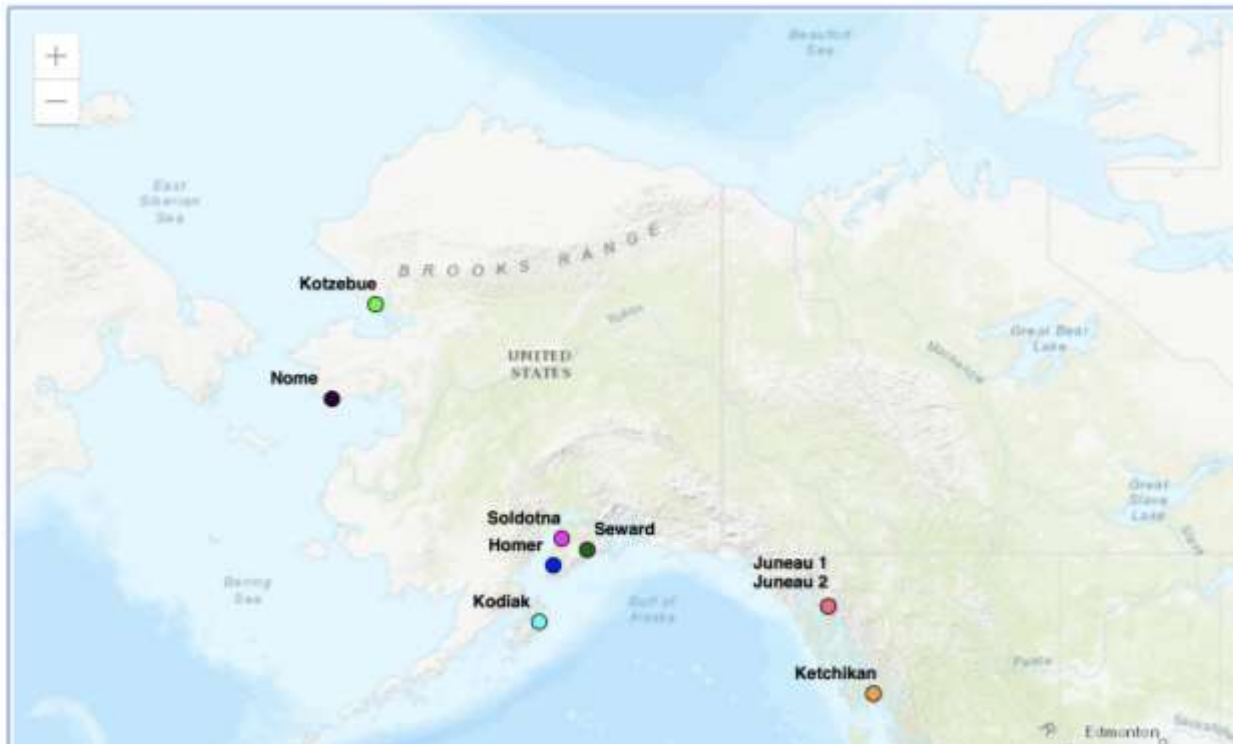
## COMMUNITY-BASED AIR MONITORING PILOT PROJECT

DEC is in the process of deploying AQMesh E<sub>5</sub> sensor pods to hub communities throughout Alaska as part of a Community-Based Air Monitoring Pilot Project. This webpage will display data from the pods as they are deployed and begin reporting data.

Data from the pods are not available until approximately 15 minutes after the top of the hour.

### AQMesh Deployment Map

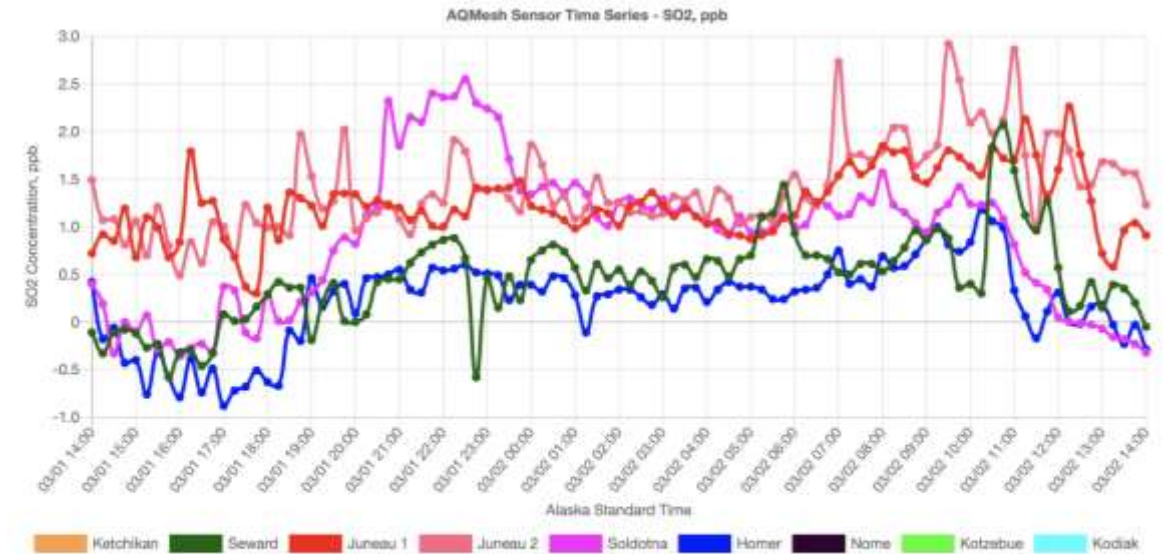
The map displays the locations of each AQMesh pod.



Section A, Item 1.

### Charts

Data from all of the operational sensor units are shown as 15-minute average values for the preceding 24 hour period. Please note the time series is presented in Alaska Standard Time. Click buttons below the plot to view different parameters. To turn stations on or off, click on the site name in the legend.



PM1.0 PM2.5 PM4.0 PM10.0 CO NO NO2 SO2 Temp RH Pressure

E<sub>5</sub> Indicates an external site.



# North American Emissions Control Area(ECA), Proposed Arctic ECA



Canada, 2024

# Greenhouse Gases

Large amount of fuel burned- propulsion, heat, electricity, incineration

Higher energy usage in ports compared with other ship types

Shore power

Work underway on energy efficiency, long term transition, alternative fuels

Alternative fuels may be more limited on passenger ships with safety concerns

“Slow sailing” may be an effective way to reduce, but may not work for Alaska

# Greenhouses Gases (International)

International Maritime Organization work ongoing, more studies and meetings

Current goals are:

2030- 20% to 30% reduction of annual GHG

2040- 70 to 80% reduction of GHG

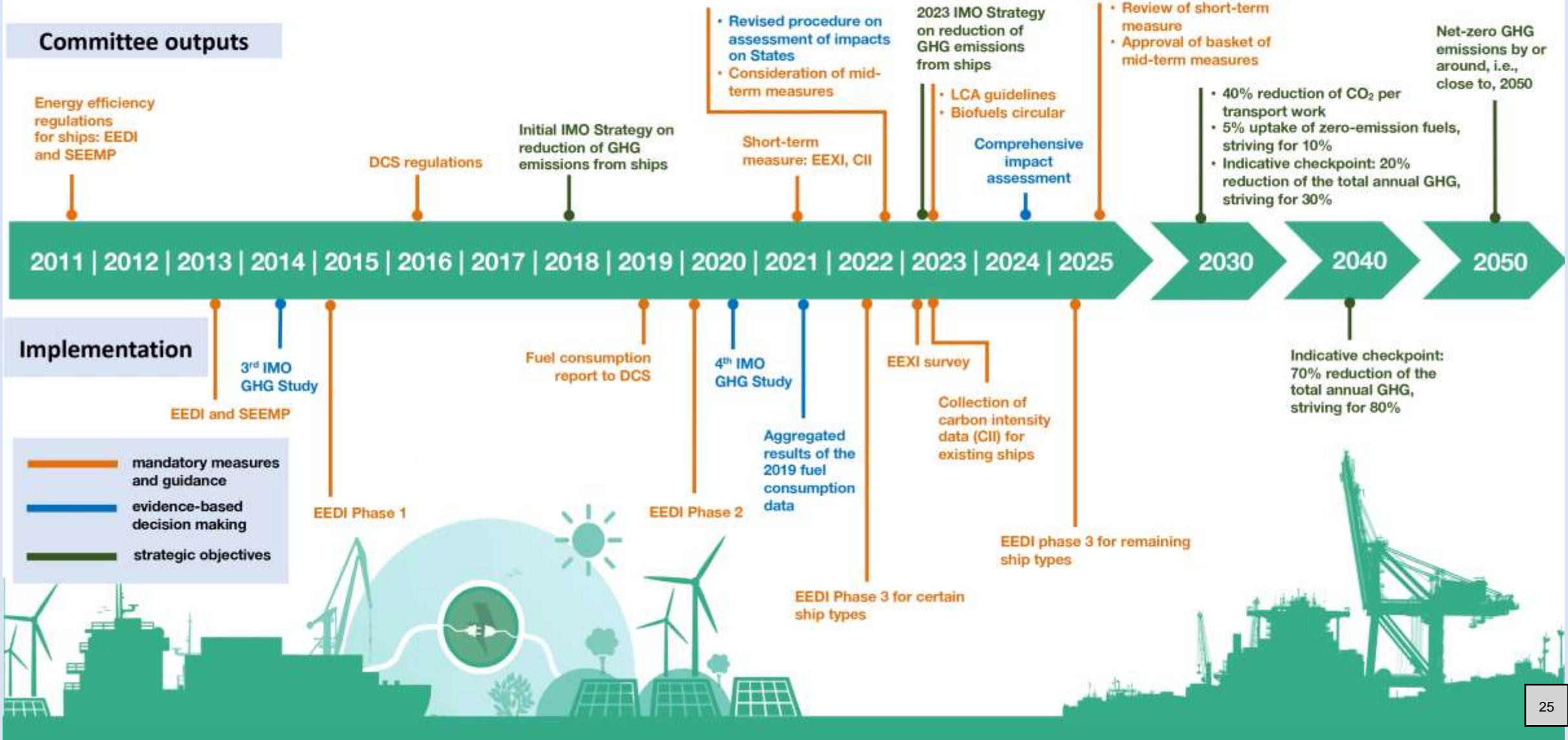
“By or around” 2050: net zero

Norway zero emissions in world heritage fjords by 2032, 2026 for smaller ships



# Addressing climate change

Over a decade of regulatory action to cut GHG emissions from shipping



# Scrubbers (EGCS)

Allowed as alternative to low sulfur fuels

Open loop scrubbers use seawater and discharge wastewater

Estimated discharge rates of 90 m<sup>3</sup> kWh, closed loop at 0.45 m<sup>3</sup> kWh (Jalkanen et al. 2021)

Sheens, foam reported in Alaska



# Scrubber updates

US VIDA law in 2018 removed state authority to regulate

VIDA 2024 rules relax pH requirements to match international (allow mixing zone)

Ports in other nations and some regions have banned discharge (80 bans)

Studies on water quality underway by NGOs, CLIA, others

IMO revising testing and other guidelines



# Neighborhood Association Perspectives

## December 2019

### **Top negative concerns (Issue, # of votes)**

- 1) Overcrowding, traffic, development increases 17
- 2) Whale watching 11
- 3) Helicopter noise 8
- 4) Air pollution 9
- 5) Wastewater pollution 7
- 6) Noise (general) and light pollution (airplanes, jet skis, DT vendors, traffic) 7
- 7) Local Business, industry influence 7
- 8) Lack of control, no government regulation 6
- 9) Boat wakes, energy, wildlife feeding 5

### **Top positive impacts**

- 1) Alaska Native / Cultural 9
- 2) Tax opportunities 6
- 3) Small Business Opportunities 3
- 4) Restaurants 3
- 5) Infrastructure (hospital area) 2
- 6) TBMP 2

## February 2024

### **Top negative concerns**

- 1) Overcrowding - SAME
- 2) Noise (Ambient) - UP
- 3) Whale Watching – down one
- 4) Loss of Control - UP
- 5) Air Pollution - Down
- 6) Wastewater pollution - Down
- 7) Boat Wakes – up one
- 8) Local Business Influence - Down



# Neighborhood Association Cruise Ship Perceptions

2019 Neighborhood Association Cruise Ship impacts, Ranked in comparison with each other. (1 = worse issue)	2024 Neighborhood Association Cruise Ship Ranked by number of NAs votes indicating that the issue is “worse” than 2019.
1) Overcrowding	<b>1) Noise (General) (10 NAs)</b>
2) Whales	<b>2) Overcrowding (8 NAs)</b>
3) Helicopter Noise	2) Whales (General) (8 NAs)
4) Air Pollution	<b>4) Lack of (local) Business influence (8 NAs)</b>
5) Wastewater Pollution	<b>5) Lack of (local) Govt control (8 NAs)</b>
<b>6) Noise (General)</b>	<b>6) Helicopter Noise (7 NAs)</b>
7) Lack of (local) Business influence	<b>7) Air Pollution (5 NAs)</b>
8) Lack of (local) Government control	<b>8) Boat Wakes (4 NAs)</b>
<b>9) Boat Wakes</b>	<b>9) Wastewater Pollution (3 NAs)</b>

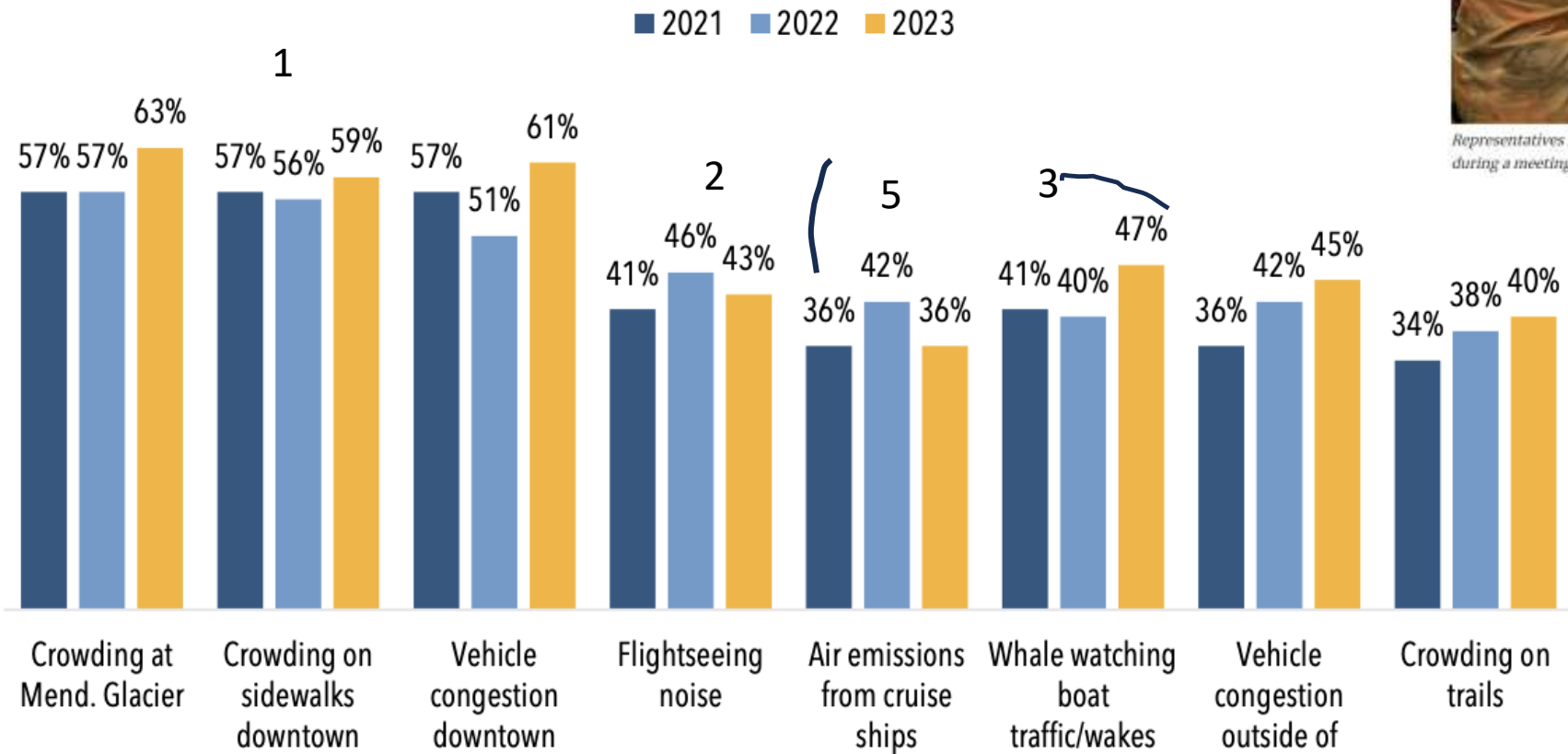
# Neighborhood Association Cruise Ship Perceptions

Neighborhood	Number of impacts	Impacts
West Juneau	9 of 9	All the issues are worse
N. Douglas	7 of 9	All issues worse accept air, water, pollution the same
Thane	7 of 9	All worse except; air, water, and noise are the same.
Airport Area	6 of 9	Three are worse except air, water, and wake.
Downtown	5 of 9	Five are worse and three the same
Shelter Island	4 of 9	Four are worse and three the Same



# Survey & Community Perceptions

Percentage of Households Somewhat/Very Affected, 2021, 2022, 2023



Section A, Item 1.

Representatives from several Juneau neighborhood associations discuss environmental impacts from tourism during a meeting on Dec. 11, 2019. (Photo by Adelyn Baxter/KTOO)

# Juneau – Ship-Free Saturday Unofficial Results 10-4-24

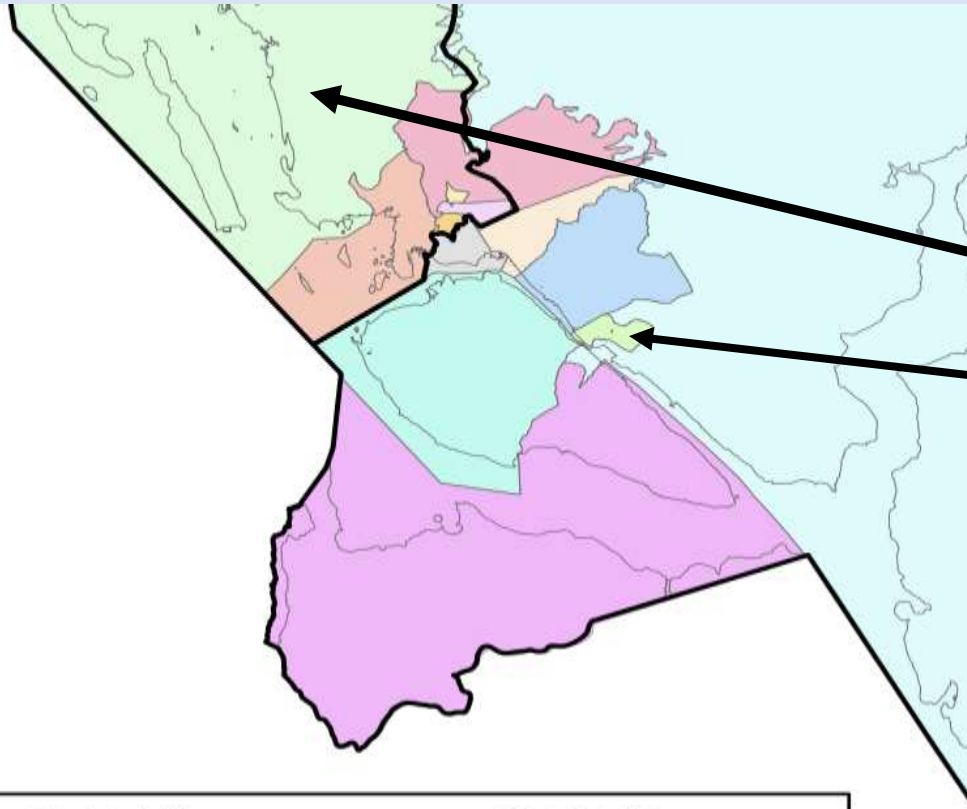
## Proposition #2 (Vote for 1)

Precinct	Times Cast	Registered Voters
<b>Municipal</b>		
<b>City and Borough of Juneau</b>		
03-300 Auke Bay	893	2,060
03-305 Lynn Canal	752	1,414
03-310 Melvin Park	748	2,333
03-315 Mendenhall Glacier	1,146	3,376
03-320 Thunder Mountain	1,059	3,556
04-100 Douglas	653	1,779
04-105 Juneau Airport Area	418	1,585
04-110 Juneau No. 1	795	2,360
04-115 Juneau No. 2	1,023	2,353
04-120 Juneau No. 3	438	1,097
04-125 Lemon Creek	455	2,476
04-130 Glacier Valley Area	565	2,231
04-135 North Douglas	688	1,493
99-999 Questioned Ballot	0	0
City and Borough of Juneau - Total	9,633	28,113
<b>Cumulative</b>		

Two Precincts voted for it. Downtown and Lynn Canal

Precinct	SHIP-FREE SATURDAYS, YES	SHIP-FREE SATURDAYS, NO	Total Votes
<b>Municipal</b>			
<b>City and Borough of Juneau</b>			
03-300 Auke Bay	345	537	882
03-305 Lynn Canal	398	349	747
03-310 Melvin Park	251	494	745
03-315 Mendenhall Glacier	358	774	1,132
03-320 Thunder Mountain	336	719	1,055
04-100 Douglas	266	383	649
04-105 Juneau Airport Area	153	260	413
04-110 Juneau No. 1	323	463	786
04-115 Juneau No. 2	529	478	1,007
04-120 Juneau No. 3	182	253	435
04-125 Lemon Creek	153	296	449
04-130 Glacier Valley Area	172	383	555
04-135 North Douglas	285	399	684
99-999 Questioned Ballot	0	0	0
City and Borough of Juneau - Total	3,751	5,788	9,539
<b>Cumulative</b>			

# Juneau – Ship-Free Saturday Unofficial Results



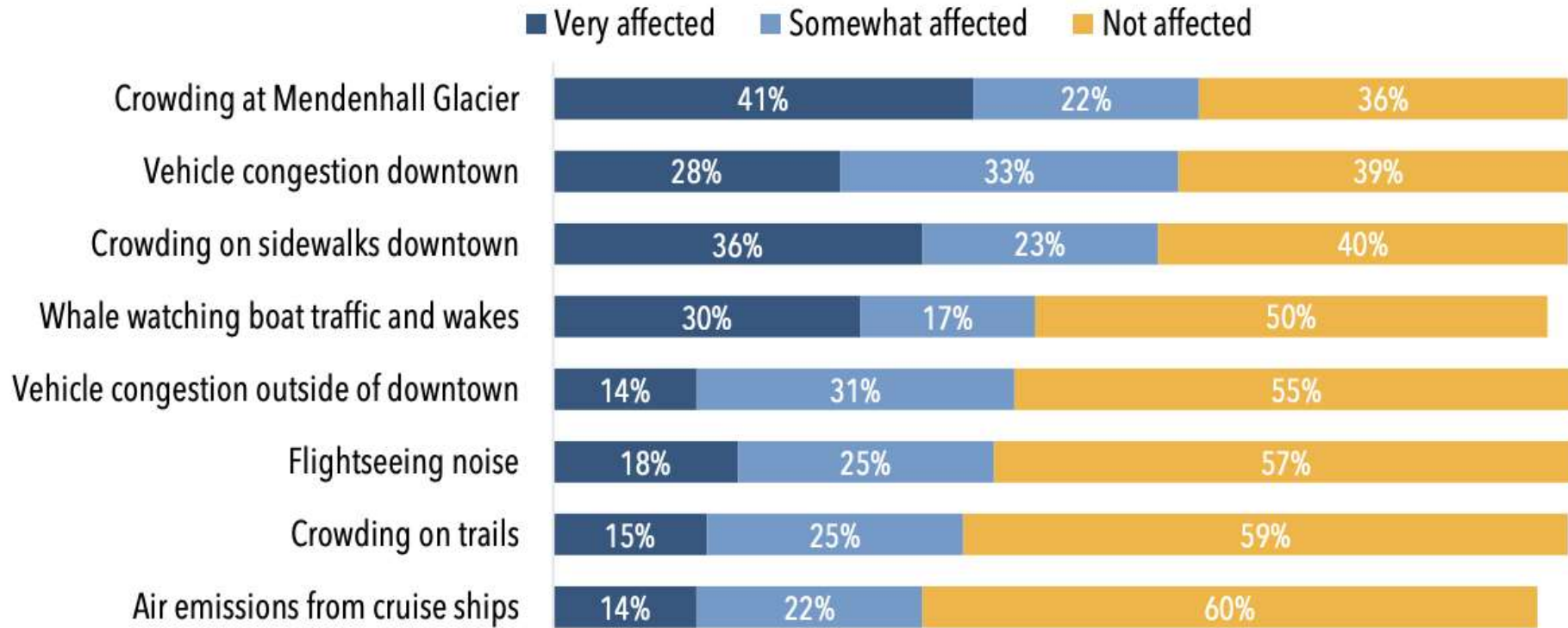
Two Precincts voted for ship Free

- Downtown – crowded ?
- Lynn Canal - overlooking whale activity ?

<u>District #1</u> PRECINCTS	<u>District #2</u> PRECINCTS
33-500 Douglas	34-400 Auke Bay
33-510 Juneau No. 1	34-420 Lynn Canal
33-515 Juneau No. 2	34-430 Mendenhall No. 1
33-520 Juneau No. 3	34-440 Mendenhall No. 2
33-525 Lemon Creek	34-450 Mendenhall No. 3
33-530 North Douglas	34-460 Mendenhall No. 4
34-410 Juneau Airport	



**For each of the following visitor-related impacts, was your household very affected, somewhat affected, or not affected in 2023?**



MCKINLEY RESEARCH GROUP

2



Current Year 2024

Concern Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Season
Other	1	0	1	4	16	17	9	16	6	0	0	0	70
Aircraft	0	0	0	2	22	20	8	13	9	0	0	0	74
Vehicle: Bus/Shuttle	0	0	0	3	14	17	14	17	8	0	0	0	73
Vehicle: Trolley	0	0	0	0	1	0	1	0	0	0	0	0	2
Vessel: Whale Watching	0	0	0	2	5	9	3	4	1	0	0	0	24
Vessel: Other	0	0	0	0	1	4	1	0	0	0	0	0	6
Cruise: Noise	0	0	0	0	4	5	3	2	0	0	0	0	14
Cruise: Emissions (referred to DEC)	0	0	0	1	4	3	0	0	1	0	0	0	9
Cruise: Other	0	0	0	0	1	0	1	0	0	0	0	0	2
Cruise: Visual	0	0	0	1	0	0	0	0	0	0	0	0	1
TOTAL CALLS	1	0	1	13	68	75	40	52	25	0	0	0	275

Year: 2023

Concern Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Season
Other	0	0	0	0	5	8	9	10	5	0	0	0	37
Aircraft	0	0	1	0	4	3	24	11	9	0	0	0	52
Vehicle: Bus/Shuttle	0	0	0	6	5	16	21	10	7	2	0	0	67
Vessel: Whale Watching	0	0	0	0	5	6	10	7	1	0	0	0	29
Vessel: Other	0	0	0	0	0	1	2	1	0	0	0	0	4
Cruise: Noise	0	0	0	1	3	0	6	7	1	0	0	0	18
Cruise: Emissions (referred to DEC)	0	0	0	0	2	4	2	5	2	0	0	0	15
Cruise: Visual	0	0	0	0	2	1	1	0	0	0	0	0	4
TOTAL CALLS	0	0	1	7	26	39	75	51	25	2	0	0	226

The research team  
acknowledges that  
Juneau, we are on the  
land of the  
Áak'w Kwáan,  
L'eeneidí clan, and  
T'aakú Kwáan.

**Gunalcheesh!**

(Thank you!)

