Juneau Sustainability and Cruise Ships

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Juneau Commission on Sustainability Commission
October 16th, 2024

Presentation

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

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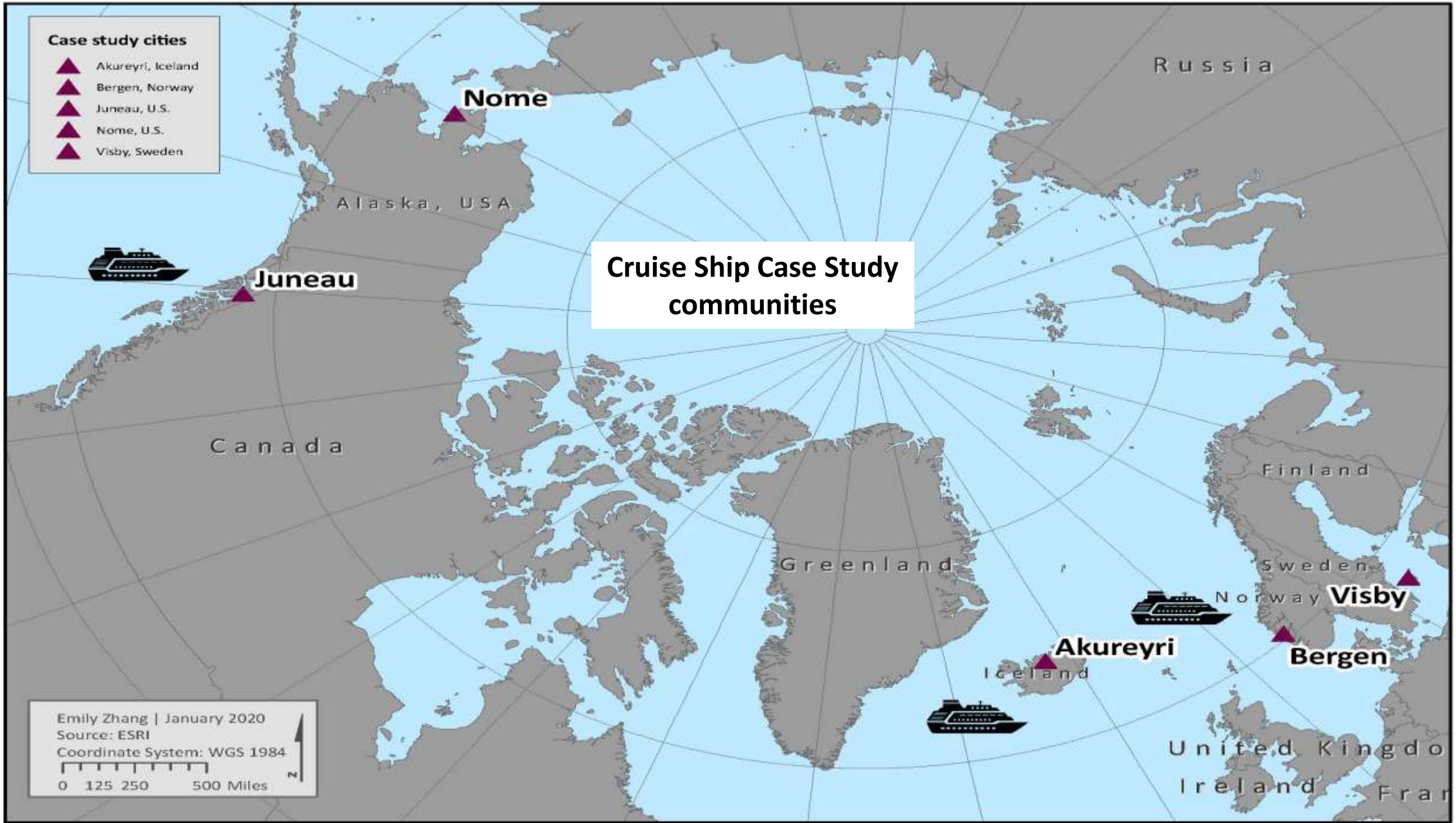
Case study cities
Akureyri, Iceland
Bergen, Norway
Juneau, U.S.
Nome, U.S.
Visby, Sweden
Nome
Russia
Alaska, USA
Juneau
Cruise Ship Case Study communities
Canada
Finland
Greenland
Sweden
Norway
Visby
Akureyri
Bergen
Iceland
United Kingdo
Ireland
Frar
Emily Zhang | January 2020
Source: ESRI
Coordinate System: WGS 1984
0 125 250 500 Miles
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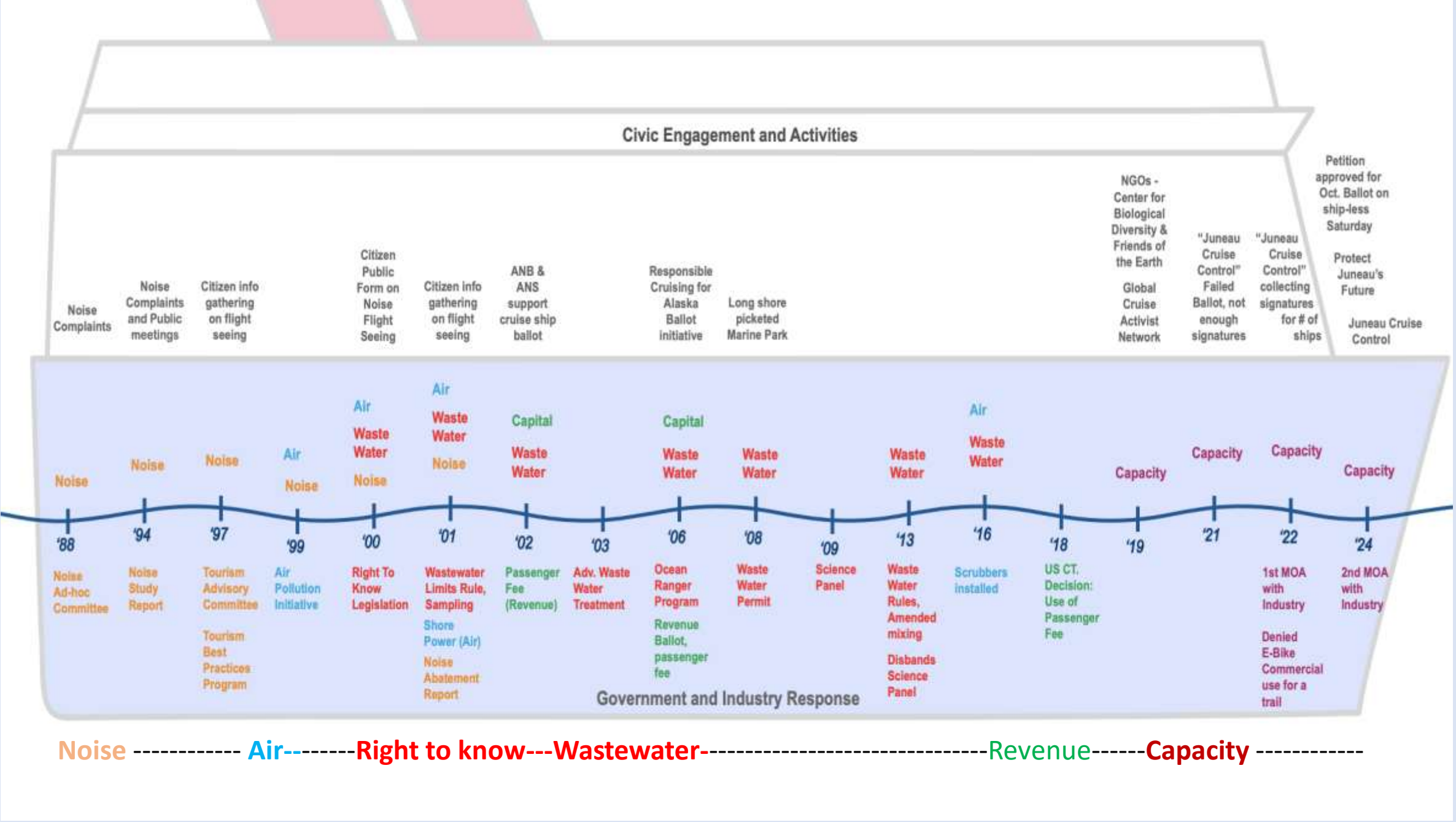
Systems Approach to Sustainable Tourism

Sustainometrics – Five Domains

Sustainometrics - Measuring Sustainability: Design, Planning, and Public Administration for Sustainable Living, C. Steward and S. Kuska



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

Powell and White, 2024

Cruise ship Environmental Practices & Controls

Impacts	Local	Regional / State	National	International
Air	**Best Practices (TBMP) 90** Hotline Shore Power	Air Quality Standards -Ship emissions -Buses Use emission scrubbers	Clean Air Act - standards	International Maritime Organization
Wastewater	Shore pump out	Water Quality Standards Water Discharge Permits Use advanced WW treatment (large ship)	Clean Water Act - Standards, Sewage, VIDA	International Maritime Organization
Noise	**Best Practices (TBMP)** Studies Rerouting helicopter/ fixed wing Technology		Fed. Aviation Adm.	IMO underwater noise in development
Traffic	**Best Practices (TBMP)**			
Wildlife (Whales)	**Best Practices (TBMP)** 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,
- 1st Waste Water Discharge Law
- Green Corridor

TBMP
Tourism Best Management Practices
Making Tourism Work for Juneau

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

Noise
Technology – Quieter planes downtown
helicopter routing

Whales
NOAA - 1oo 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

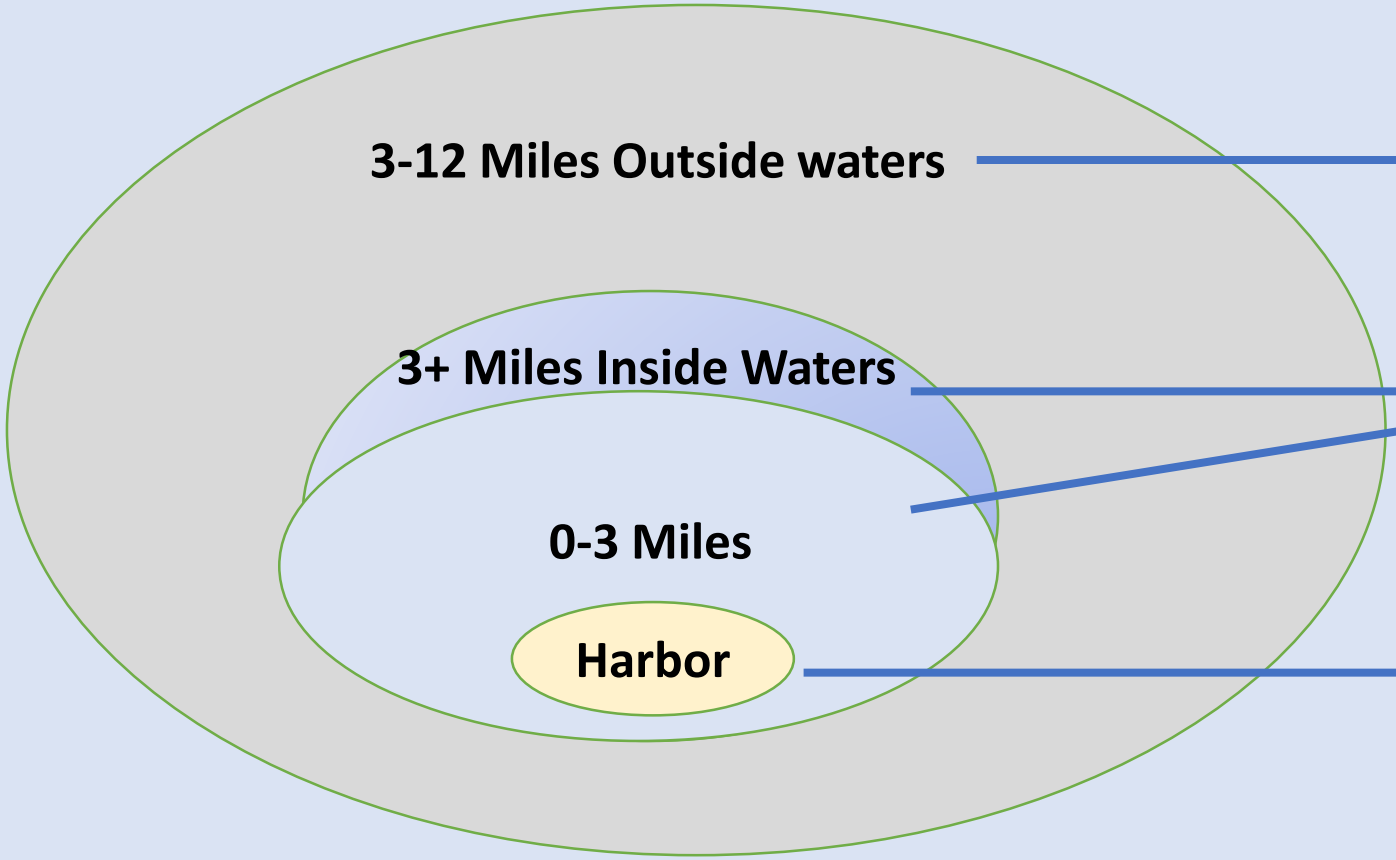
Outside Alaska

- 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



Sewage untreated and sludge discharge allowed

IMO sewage treatment requirements, no graywater requirements

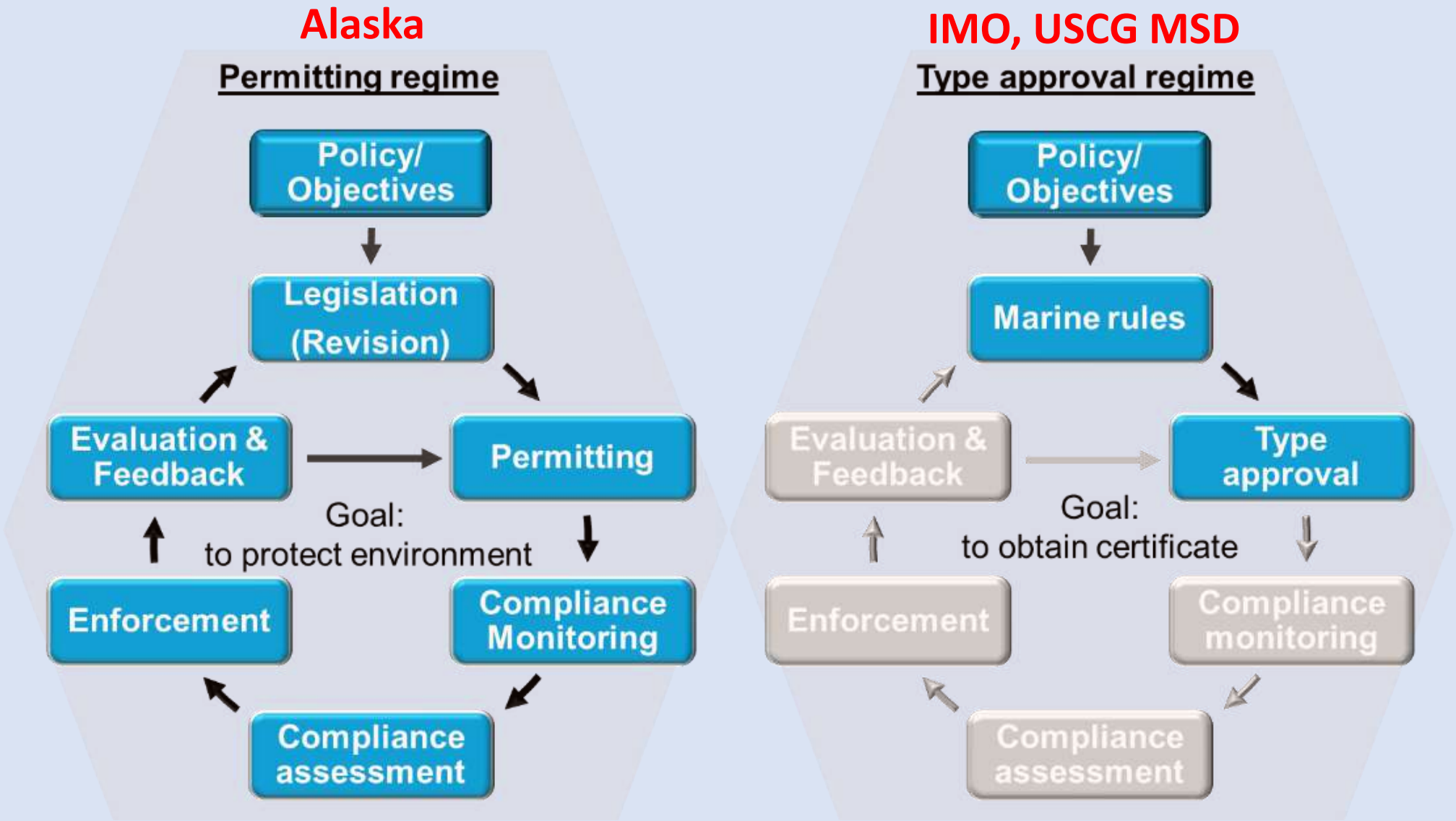
No Untreated Sewage Permit &
Performance standards for treated sewage
Grey water only if permitted and treated

Grey water and sewage if treated & permitted
Coast Guard approval needed for large cruise ships to discharge
Juneau pump out options

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

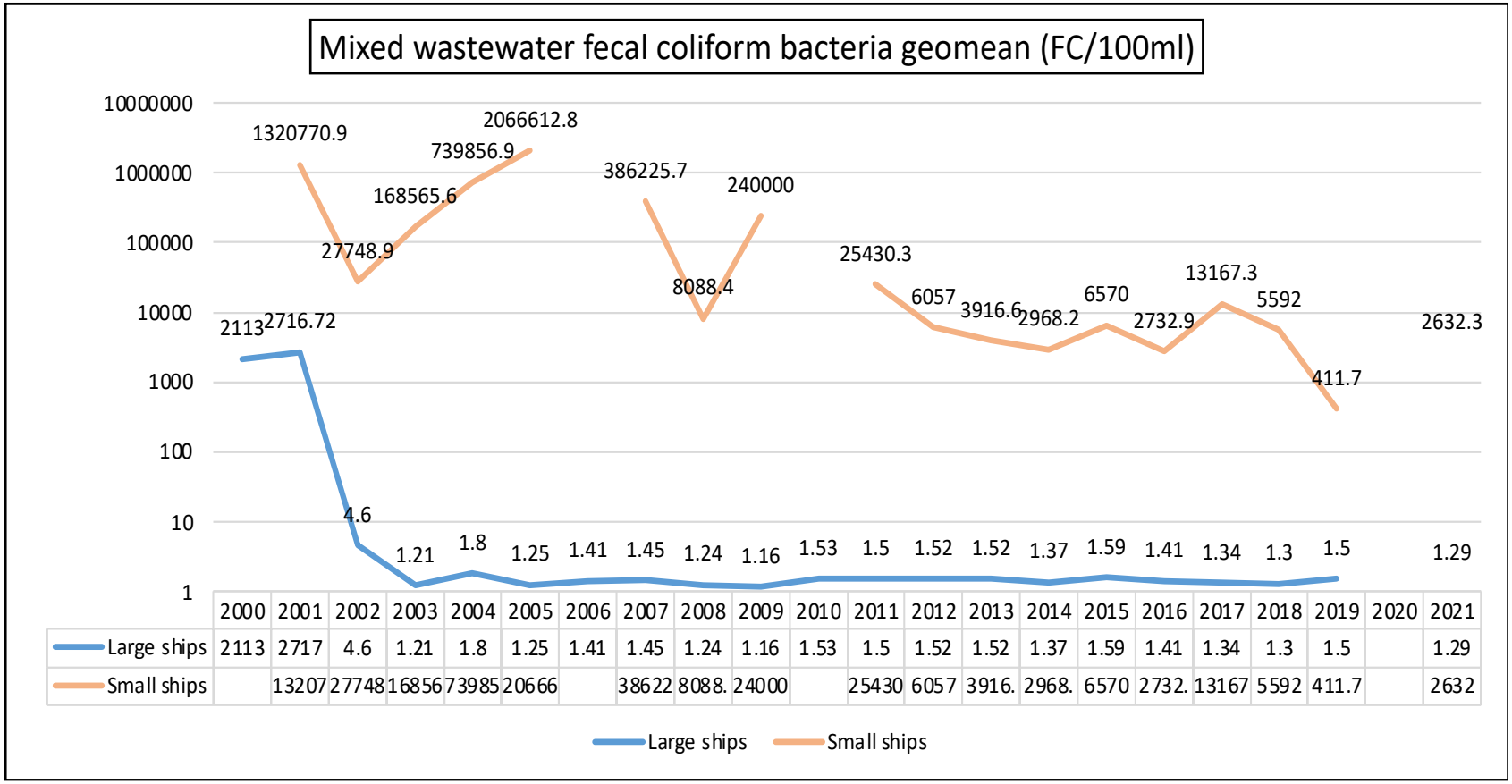
White and Powell, 2024

Alaska wastewater compared with international

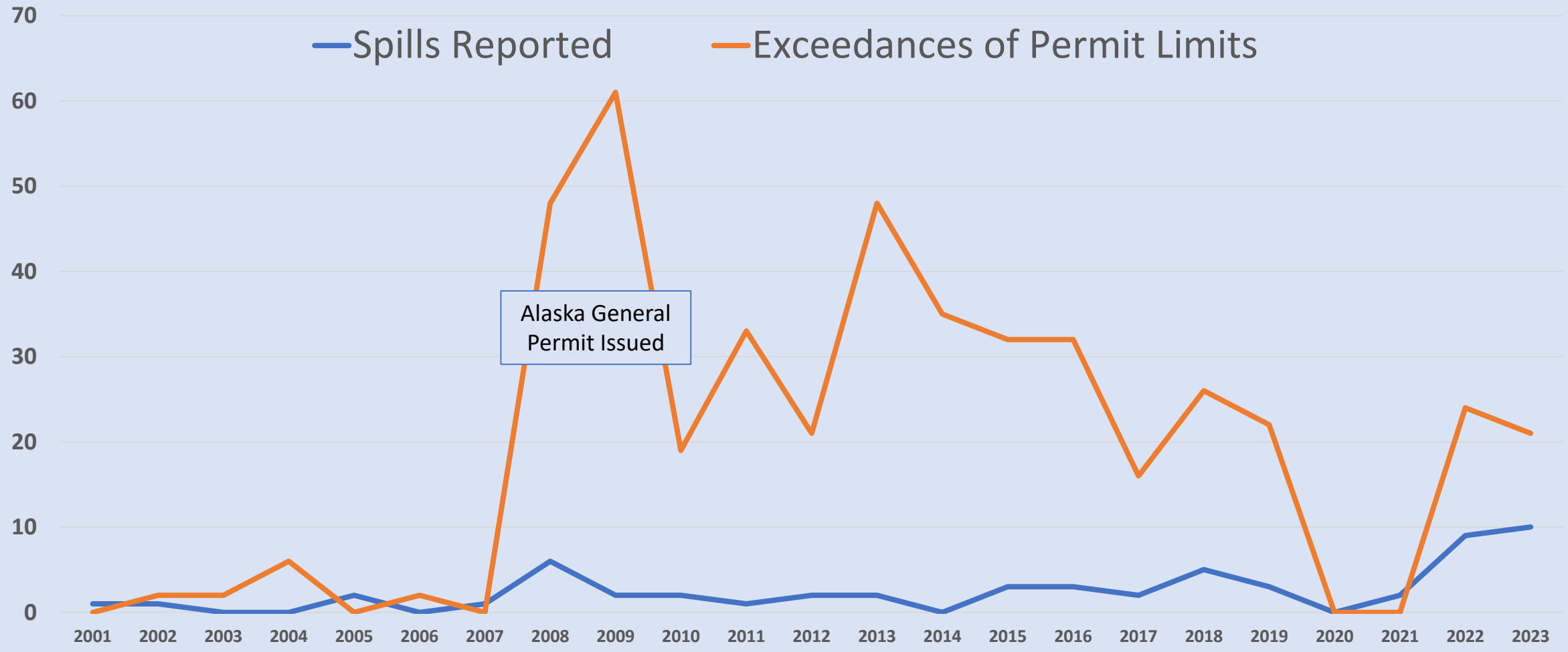


From Dr. Wei Chen

Alaska Passenger Vessel Treated Sewage Bacteria



Compliance Assessment (Alaska wastewater)



Air Emissions

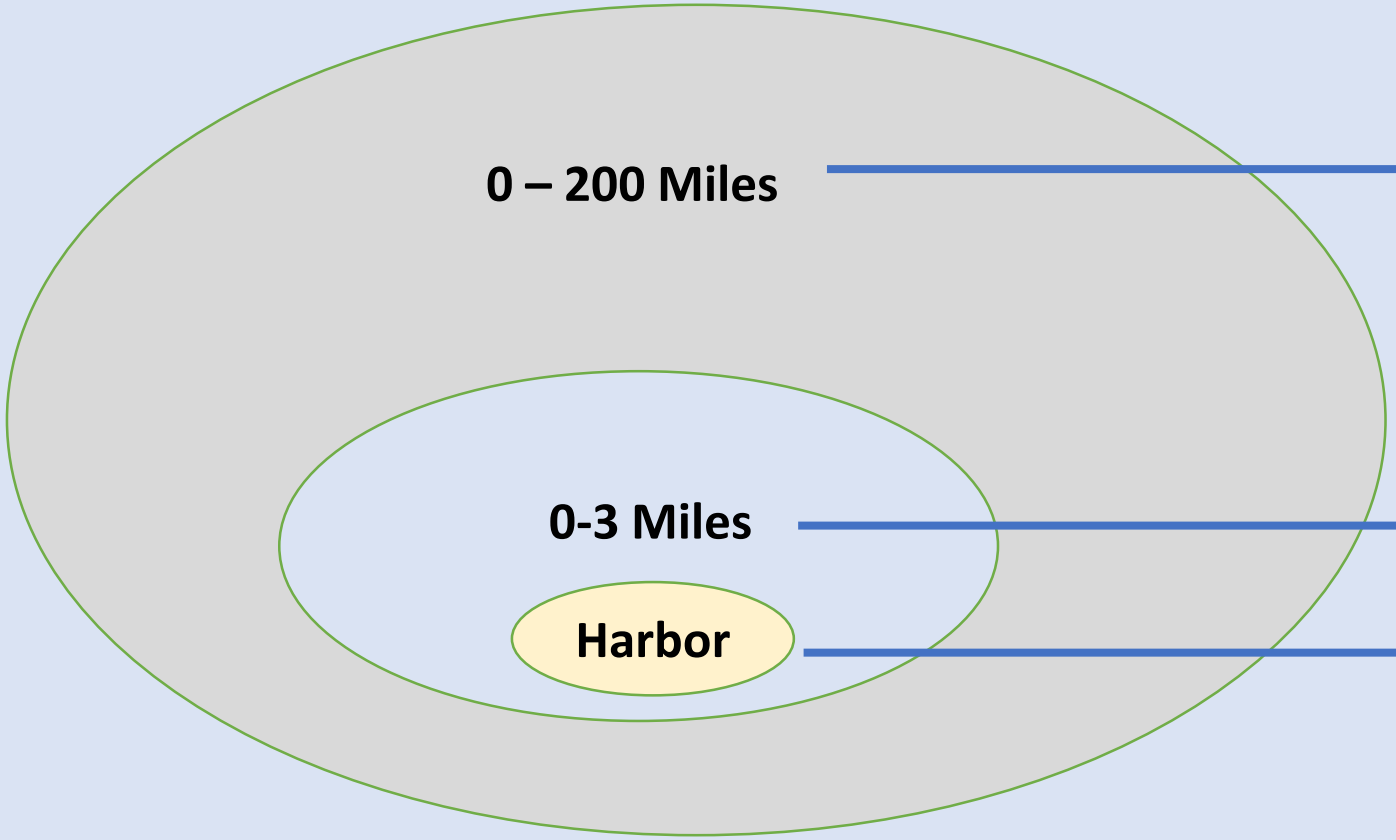
Burning of fuel for propulsion and electricity generation

Incinerator use, boilers for heat

Emissions contain gases, particulates, acids

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

Alaska Cruise Ship Air Emissions Rules and Regulations



Worldwide Sulfur Fuel Limit International rules apply, regulated by the International Maritime Organization (IMO). Fuel limit of .5% sulfur or equivalent (scrubbers).

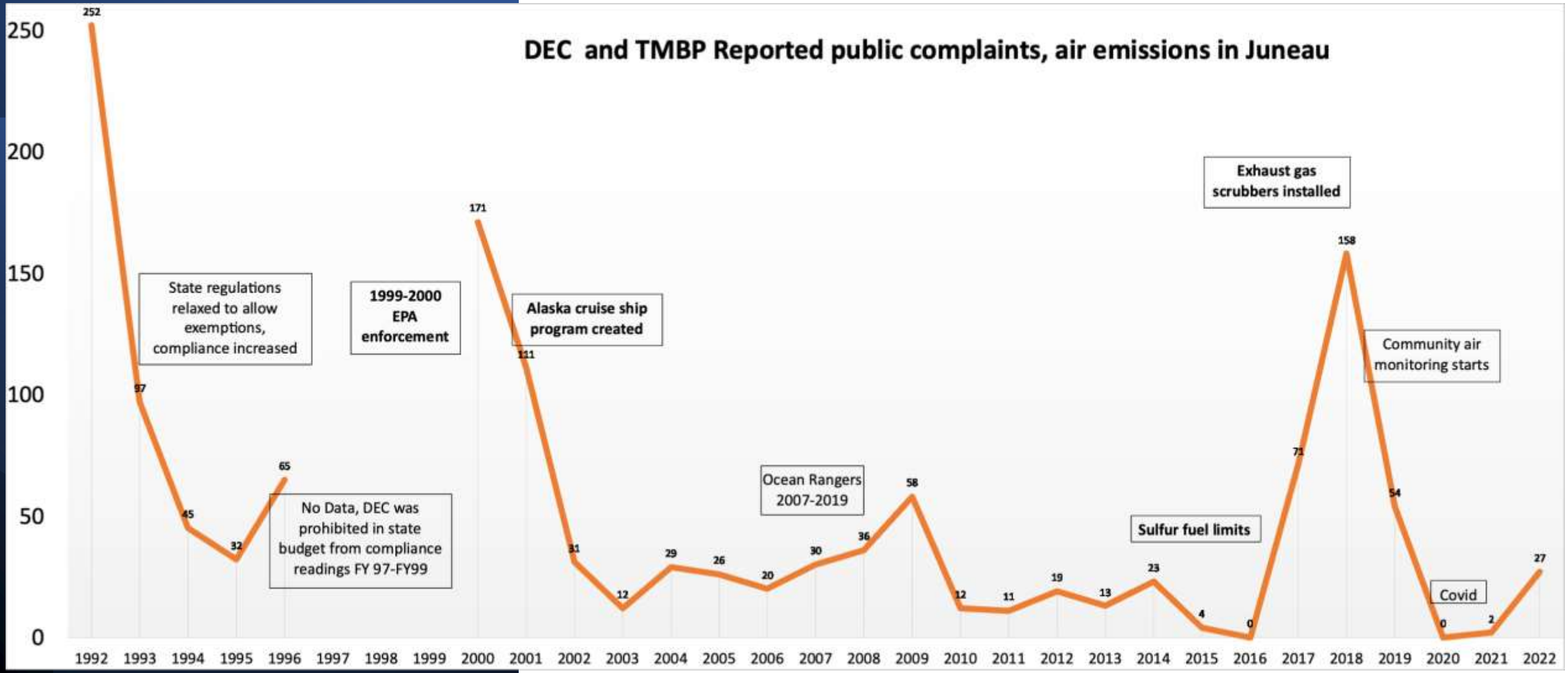
North America Emissions Control Area (ECA) Fuel sulfur limit of 0.1% or scrubbers, engine standards for nitrogen oxides. Only applies to Southeast and Southcentral areas in Alaska.

Opacity limits for ships- State regulations

Shore power available in Juneau
CBJ or TMBP agreements

White and Powell, 2024

Public complaints- Juneau Air



Division of Air Quality
MONITORING AND QUALITY ASSURANCE

Search DE

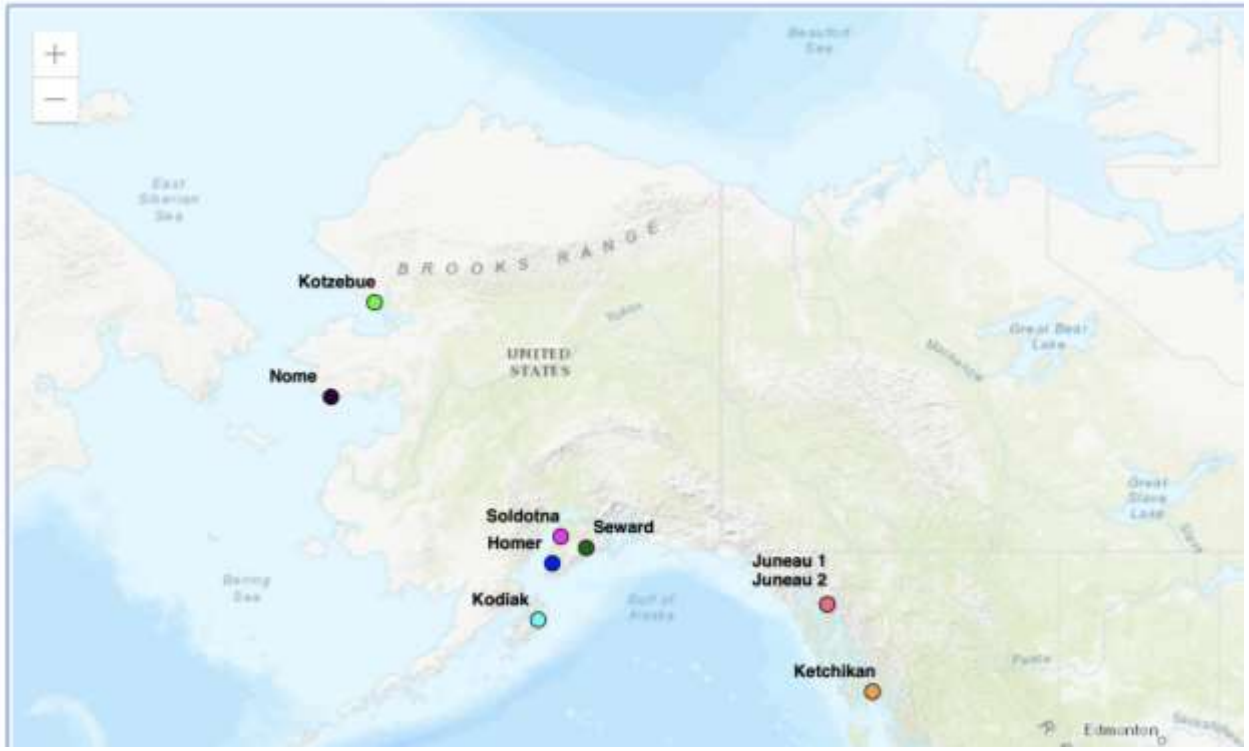
You Are Here: DEC / Air / Air-Monitoring / Community-Based Air Monitoring Pilot Project

COMMUNITY-BASED AIR MONITORING PILOT PROJECT

DEC is in the process of deploying AQMesh 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.

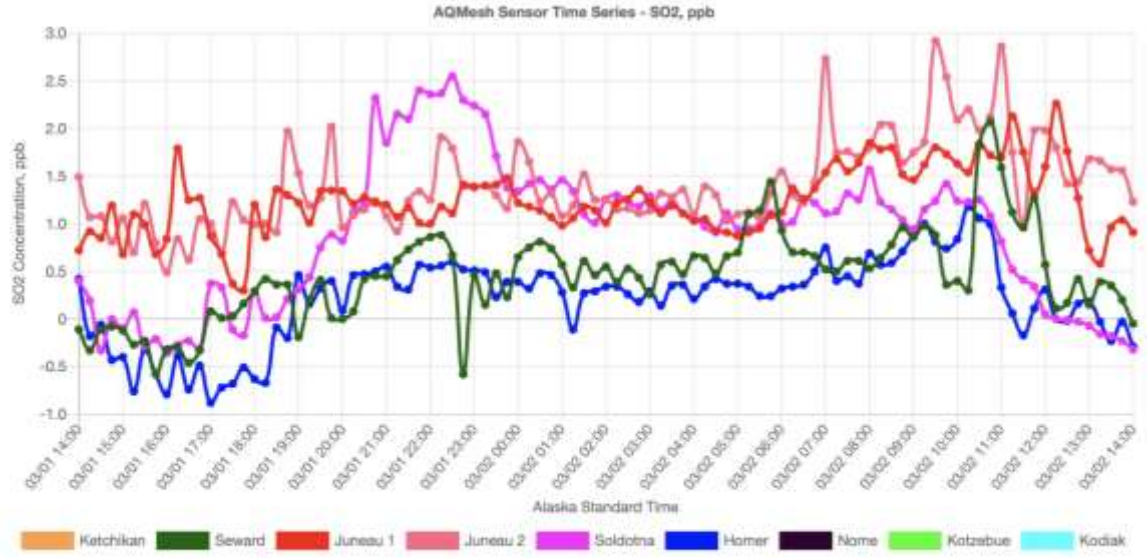
AQMesh Deployment Map

The map displays the locations of each AQMesh pod.



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

Indicates an external site.

https://dec.alaska.gov/air/air-monitoring/

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

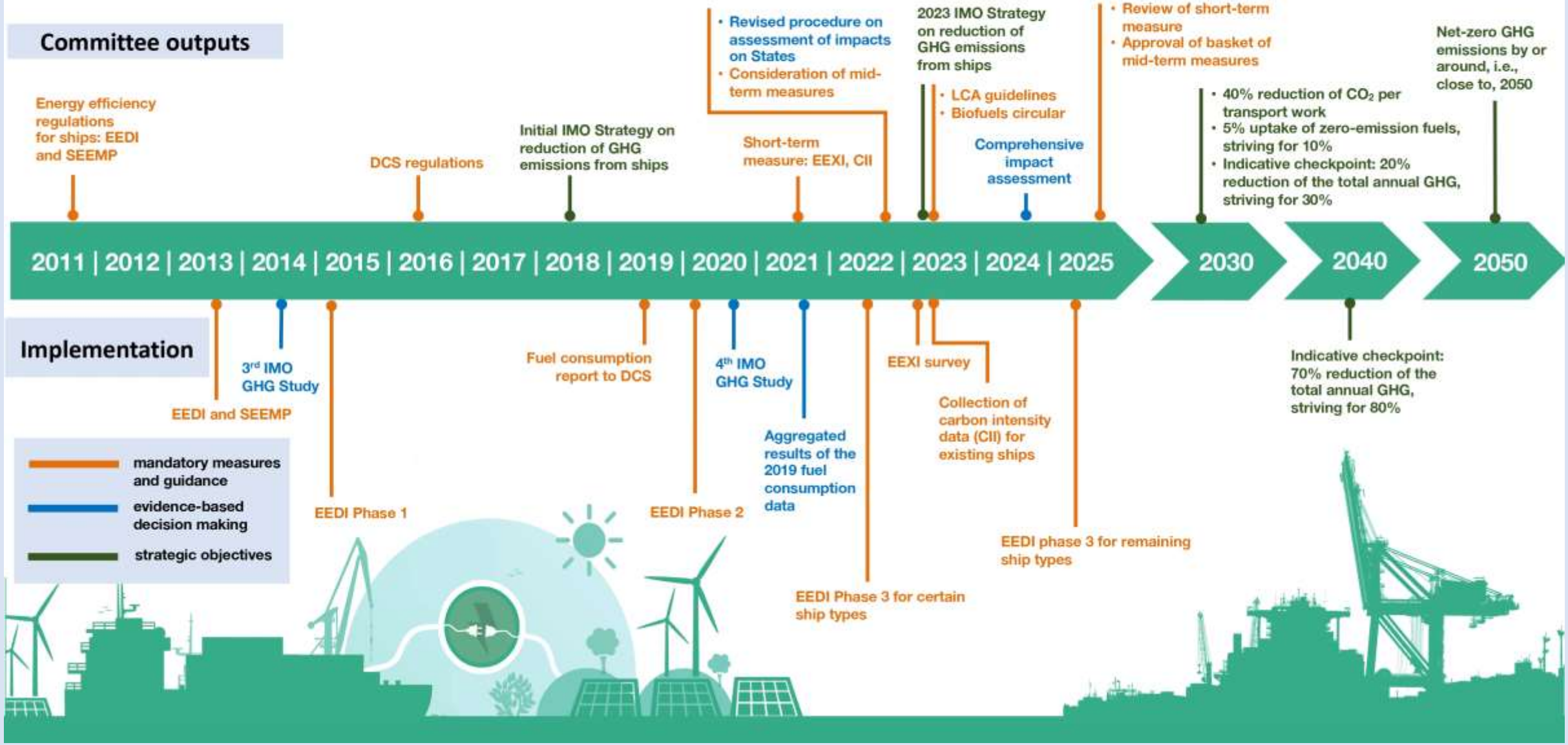
Current goals are:

- 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



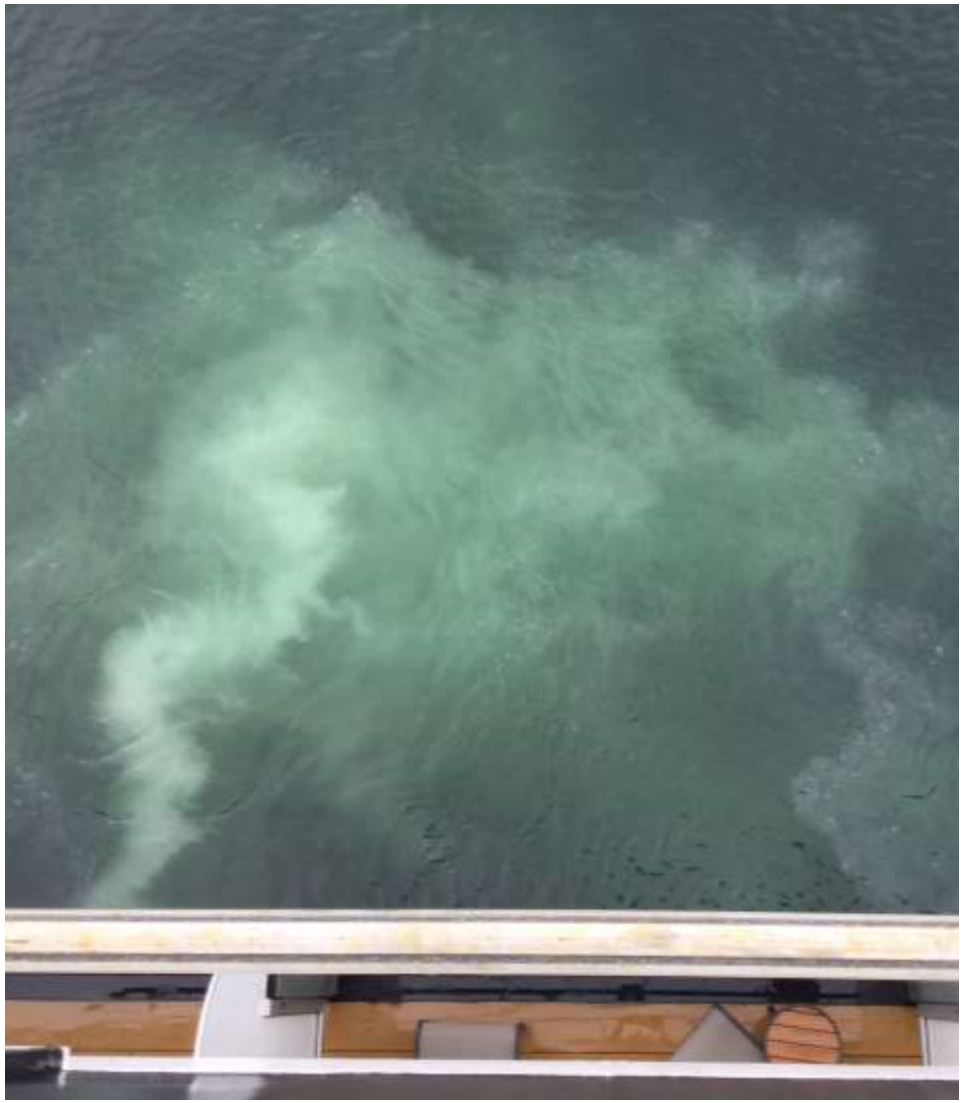
Scrubbers (EGCS)

Allowed as alternative to low sulfur fuels

Open loop scrubbers use seawater and discharge wastewater

Estimated discharge rates of 90 m^3 kWh, closed loop at 0.45 m^3 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	1) Noise (General) (10 NAs)
2) Whales	2) Overcrowding (8 NAs)
3) Helicopter Noise	2) Whales (General) (8 NAs)
4) Air Pollution	4) Lack of (local) Business influence (8 NAs)
5) Wastewater Pollution	5) Lack of (local) Govt control (8 NAs)
6) Noise (General)	6) Helicopter Noise (7 NAs)
7) Lack of (local) Business influence	7) Air Pollution (5 NAs)
8) Lack of (local) Government control	8) Boat Wakes (4 NAs)
9) Boat Wakes	9) Wastewater Pollution (3 NAs)

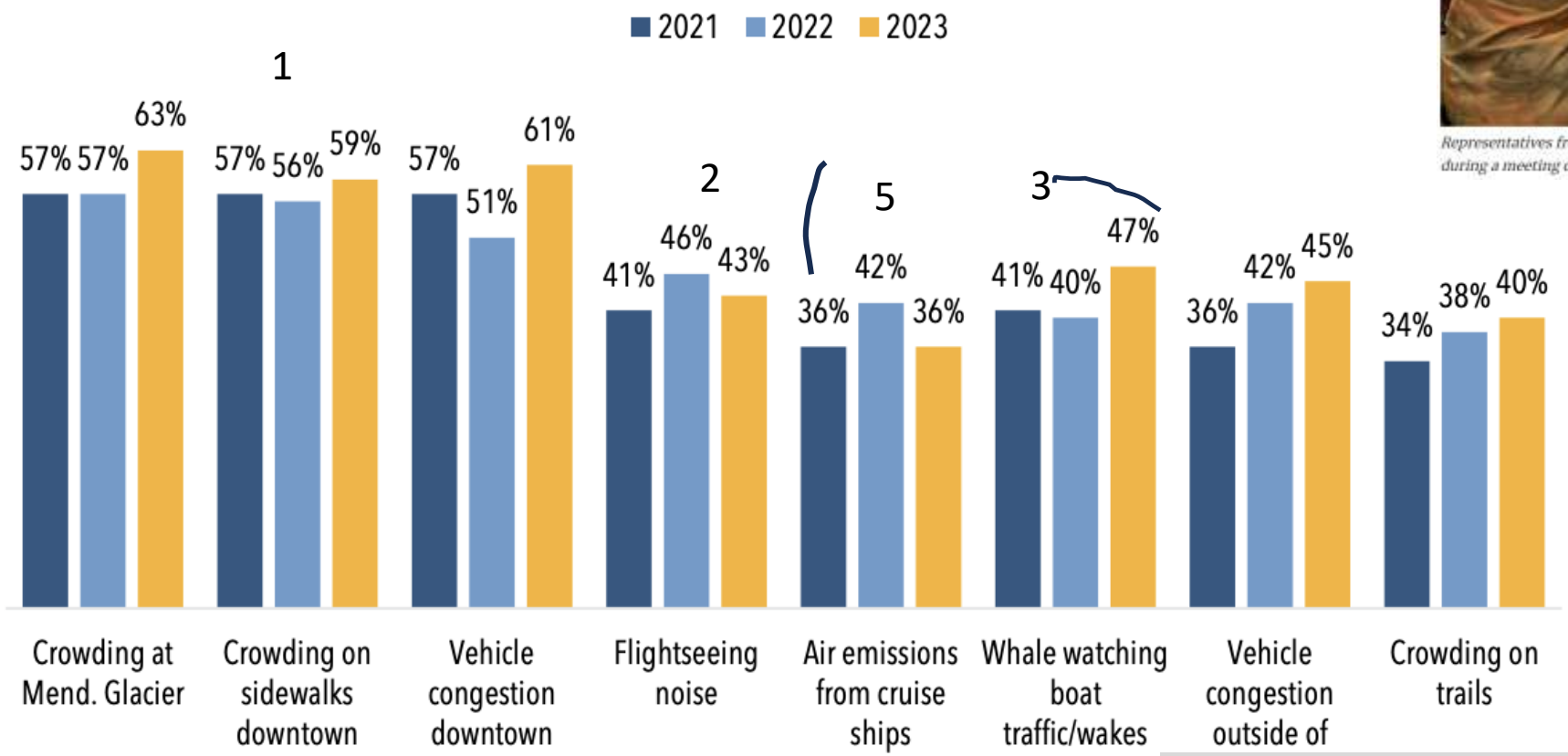
Neighborhood Association Cruise Ship Perceptions

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

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

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



Source: McKinley Resource Group

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

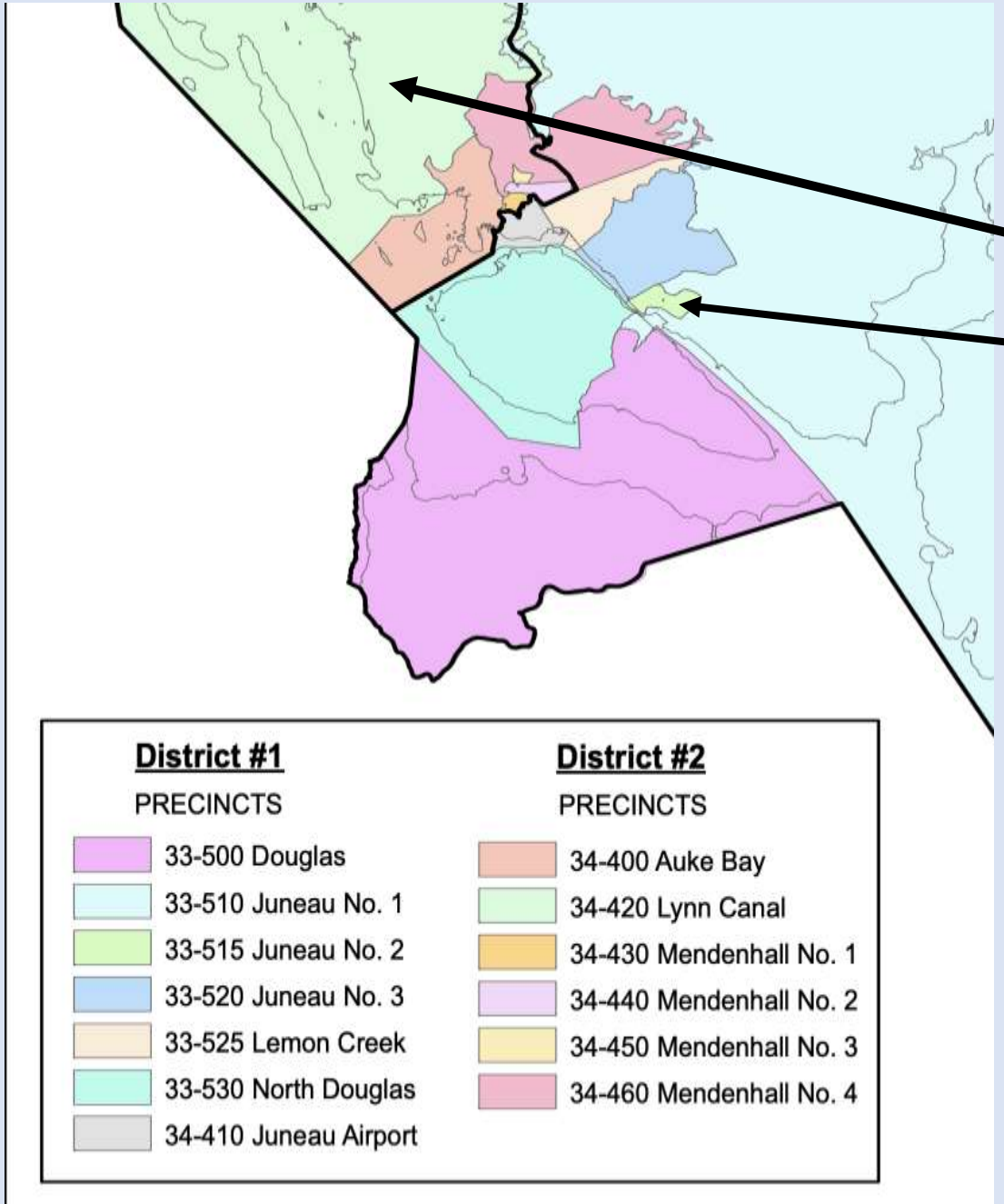
Proposition #2 (Vote for 1)

Precinct	Times Cast	Registered Voters
Municipal		
City and Borough of Juneau		
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
Cumulative		

Two Precincts voted for it. Downtown and Lynn Canal

Precinct	SHIP-FREE SATURDAYS, YES	SHIP-FREE SATURDAYS, NO	Total Votes
Municipal			
City and Borough of Juneau			
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
Cumulative			

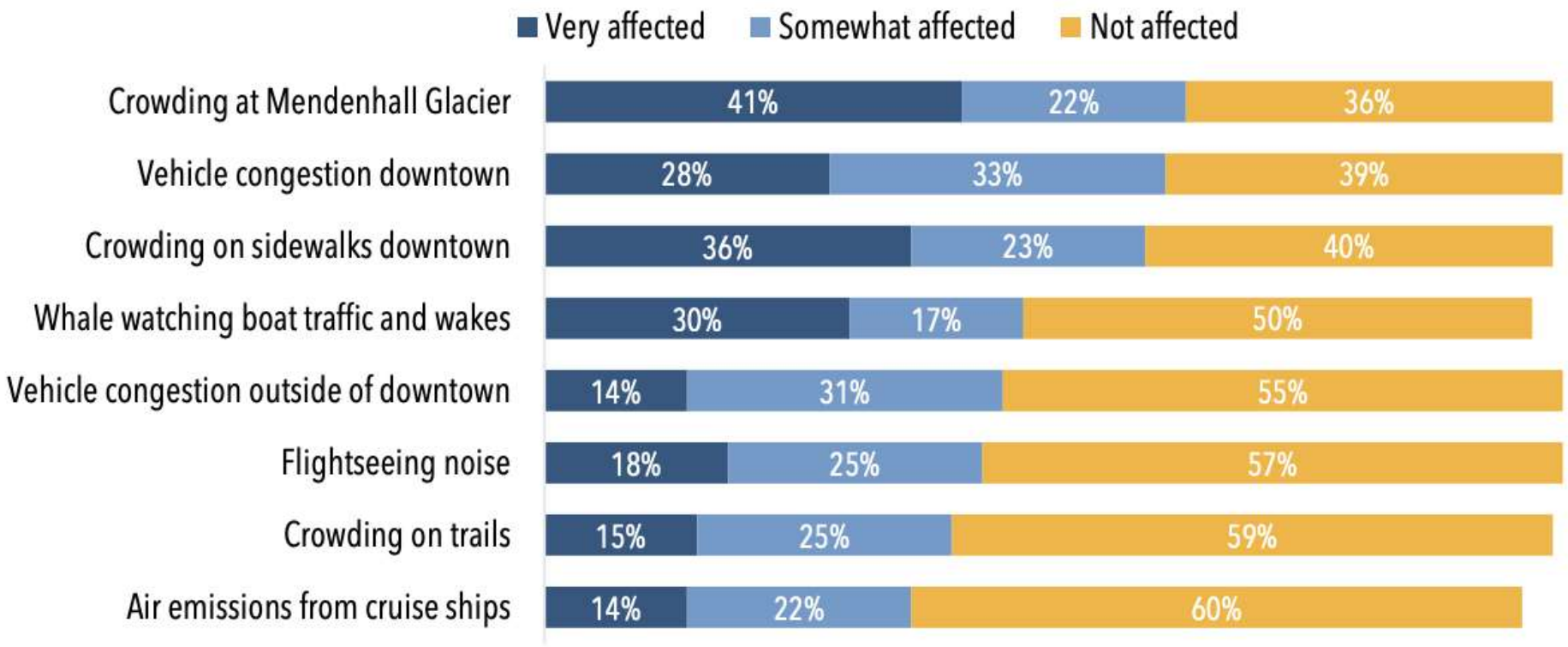
Juneau – Ship-Free Saturday Unofficial Results



Two Precincts voted for ship Free

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

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



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!)