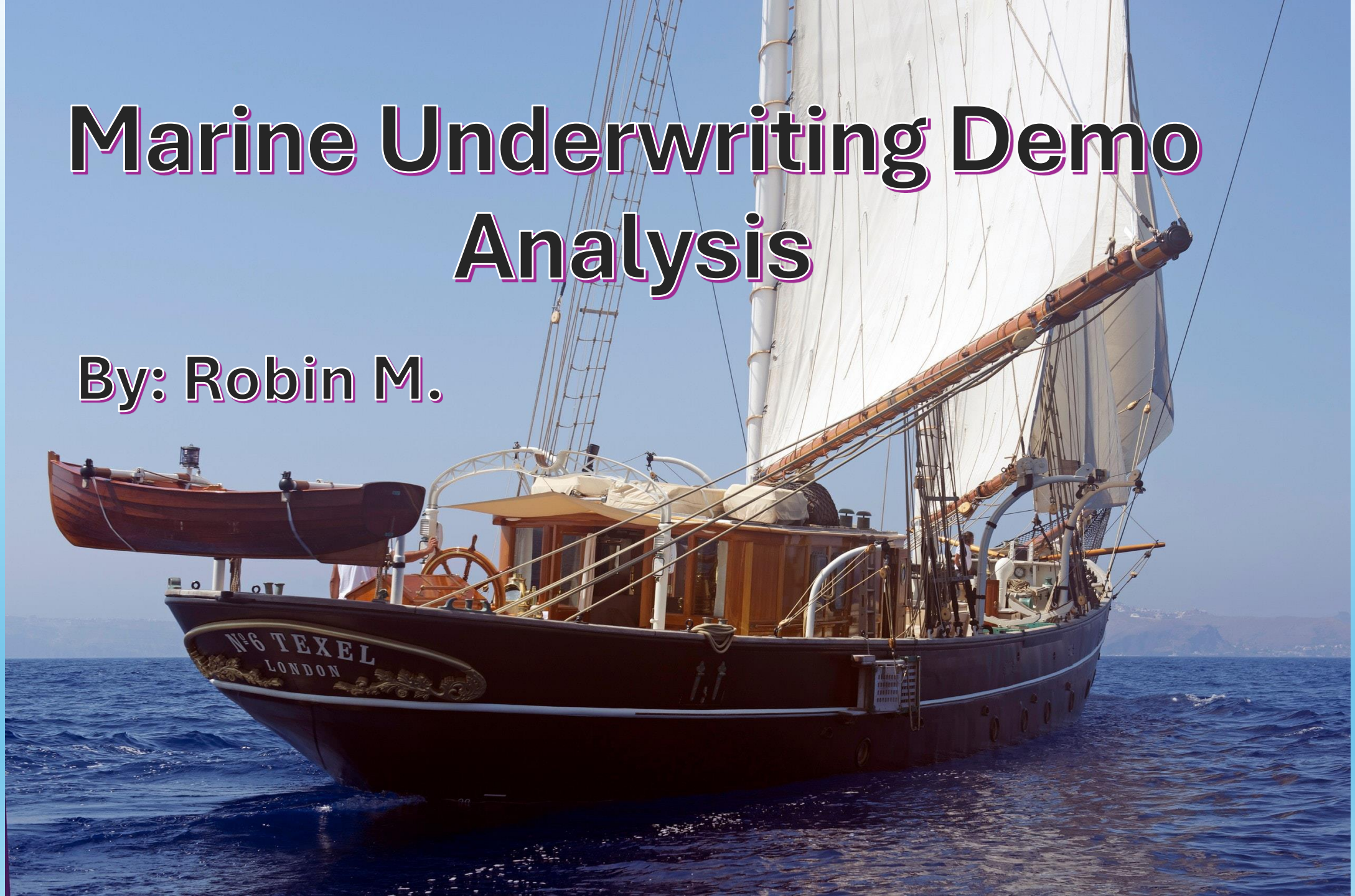


# Marine Underwriting Demo Analysis

By: Robin M.



# Background

The Direct Loss to EP ratio at Travelers according to the NAIC was 54% in 2024.

The Marine Loss Ratio for the sample 500 policies of this year are at 80%.

This indicates that an underwriting strategy should be implemented.



**PROPERTY AND CASUALTY INSURANCE INDUSTRY**  
**2024 TOP 25 GROUPS AND COMPANIES BY COUNTRYWIDE PREMIUM**  
**States, U.S. Territories, Canada and Aggregate Other Alien**  
**35-Total All Lines**

RANK	GROUP/ COMPANY CODE	GROUP/COMPANY NAME	DIRECT PREMIUMS WRITTEN	DIRECT PREMIUMS EARNED	DIRECT LOSS TO EP RATIO <sup>1</sup>	DIRECT LOSS & DCC TO EP RATIO <sup>2</sup>	MARKET SHARE %	CUMULATIVE MARKET SHARE % <sup>3</sup>
1	176	STATE FARM GRP	108,982,080,437	104,207,362,749	75.24	78.31	10.30	10.30
2	155	PROGRESSIVE GRP	75,884,809,416	72,159,533,561	60.63	62.56	7.18	17.48
3	31	BERKSHIRE HATHAWAY GRP	63,279,826,760	62,597,109,078	62.07	65.44	5.98	23.46
4	8	ALLSTATE INS GRP	55,859,006,450	53,787,917,843	64.52	66.28	5.28	28.74
5	111	LIBERTY MUT GRP	44,138,829,399	44,986,697,372	60.84	64.40	4.17	32.92
6	3548	TRAVELERS GRP	41,921,555,049	40,529,337,004	54.06	58.03	3.96	36.88
7	200	UNITED SERV AUTOMOBILE ASSN GRP	36,134,505,514	34,866,623,107	69.23	70.60	3.42	40.30
8	626	CHUBB LTD GRP	33,327,135,389	32,491,996,536	58.09	62.61	3.15	43.45
9	69	FARMERS INS GRP	28,288,708,813	27,915,125,163	55.43	57.08	2.67	46.12
10	212	ZURICH INS GRP	18,565,276,991	18,212,721,720	65.11	71.83	1.76	47.88
11	140	NATIONWIDE CORP GRP	17,693,030,666	18,467,969,533	59.20	62.72	1.67	49.55
12	473	AMERICAN FAMILY INS GRP	17,618,189,874	16,757,353,609	62.30	64.06	1.67	51.22
13	91	HARTFORD FIRE & CAS GRP	17,421,661,903	16,723,338,752	54.39	59.59	1.65	52.87
14	12	AMERICAN INTL GRP	16,115,151,961	15,851,267,968	53.12	57.21	1.52	54.39
15	280	AUTO OWNERS GRP	15,891,440,266	14,580,491,589	66.83	71.74	1.50	55.89
16	218	CNA INS GRP	14,392,563,725	13,909,679,014	63.28	68.97	1.36	57.25
17	3098	TOKIO MARINE HOLDINGS INC GRP	12,660,220,589	12,288,113,199	53.40	58.67	1.20	58.45
18	213	ERIE INS GRP	11,950,796,642	11,014,624,651	73.82	76.18	1.13	59.58
19	158	FAIRFAX FIN GRP	11,596,650,477	11,566,290,523	58.48	65.30	1.10	60.68
20	98	WR BERKLEY CORP GRP	10,995,656,633	10,549,382,326	53.13	59.03	1.04	61.72
21	84	AMERICAN FINANCIAL GRP	9,763,603,347	9,596,573,671	61.91	67.61	0.92	62.64
22	785	MARKEL GRP	9,669,062,205	9,340,668,576	61.54	71.69	0.91	63.55
23	244	CINCINNATI FIN GRP	8,641,911,908	8,019,473,315	51.67	56.84	0.82	64.37
24	1318	AUTO CLUB ENTERPRISES INS GRP	8,146,853,255	7,563,042,929	73.76	75.84	0.77	65.14
25	968	AXA INS GRP	7,697,206,391	7,559,831,645	57.25	63.20	0.73	65.87
		**INDUSTRY TOTAL**	1,057,614,621,770	1,022,075,821,994	61.83	65.74	100.00	100.00

<sup>1</sup> (Direct losses incurred / Direct premiums earned)

<sup>2</sup> (Direct losses incurred + Direct defense and cost containment expenses incurred) / (Direct premiums)

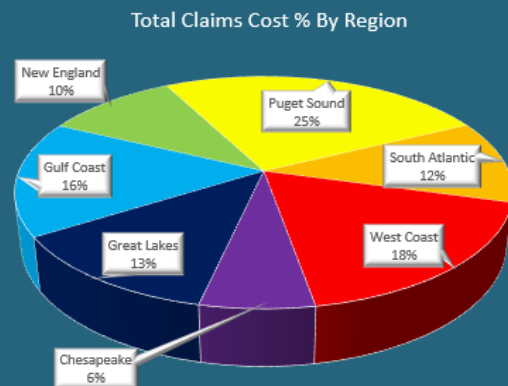
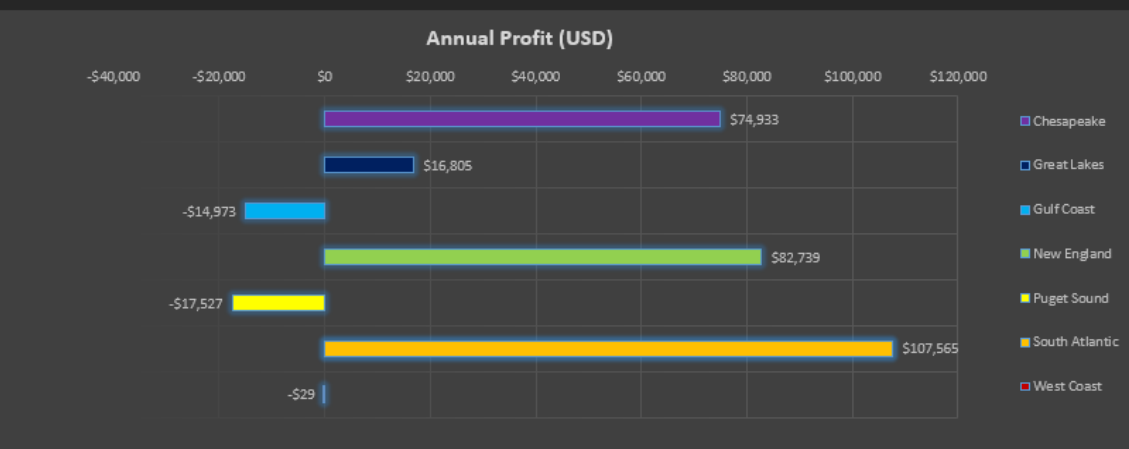


# Background

- ❑ Utilizing AI technology and industry knowledge of marine insurance, I created a mock set of data for 500 policies in a year throughout the US region.
- ❑ With prompt engineering, I specified how I wanted every column of data to be generated, such as hull types, locations, and generating purchase price values based off of Yachtworld.com.
- ❑ After the data was generated, data cleaning steps were taken to remove junk data and then it was further reorganized. AI is a beneficial tool, but the results must be monitored and reviewed before any analysis.

Using the mock data, I built a dynamic Excel dashboard that simulates how changes in underwriting rules affect overall profit, regional profit and the overall loss ratio given various sensitivity analysis.

## Marine Underwriting Simulation Dashboard



### DRILL DOWNS

#### Hull Material

☐ Aluminum  
☐ Fiberglass  
☐ Fiberglass over Wood  
☐ Inflatable  
☐ Steel  
☐ Wood

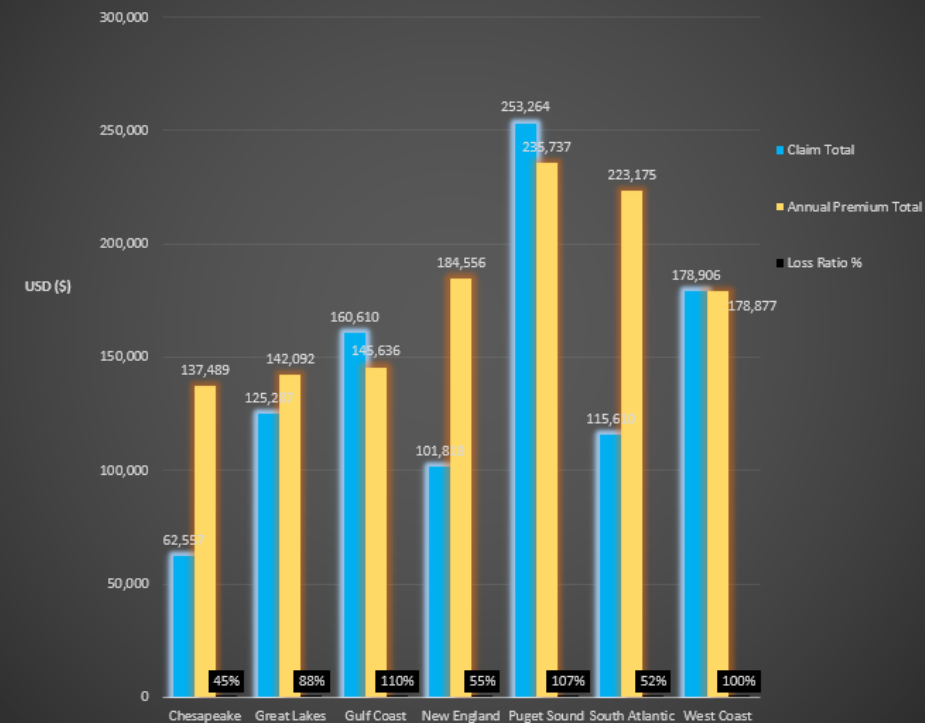
#### 25+ Year Old Model

☐ No ☐ Yes

#### Similar Watercraft Experience

☐ No ☐ Yes

### Total Claim & Premium Amount By Area



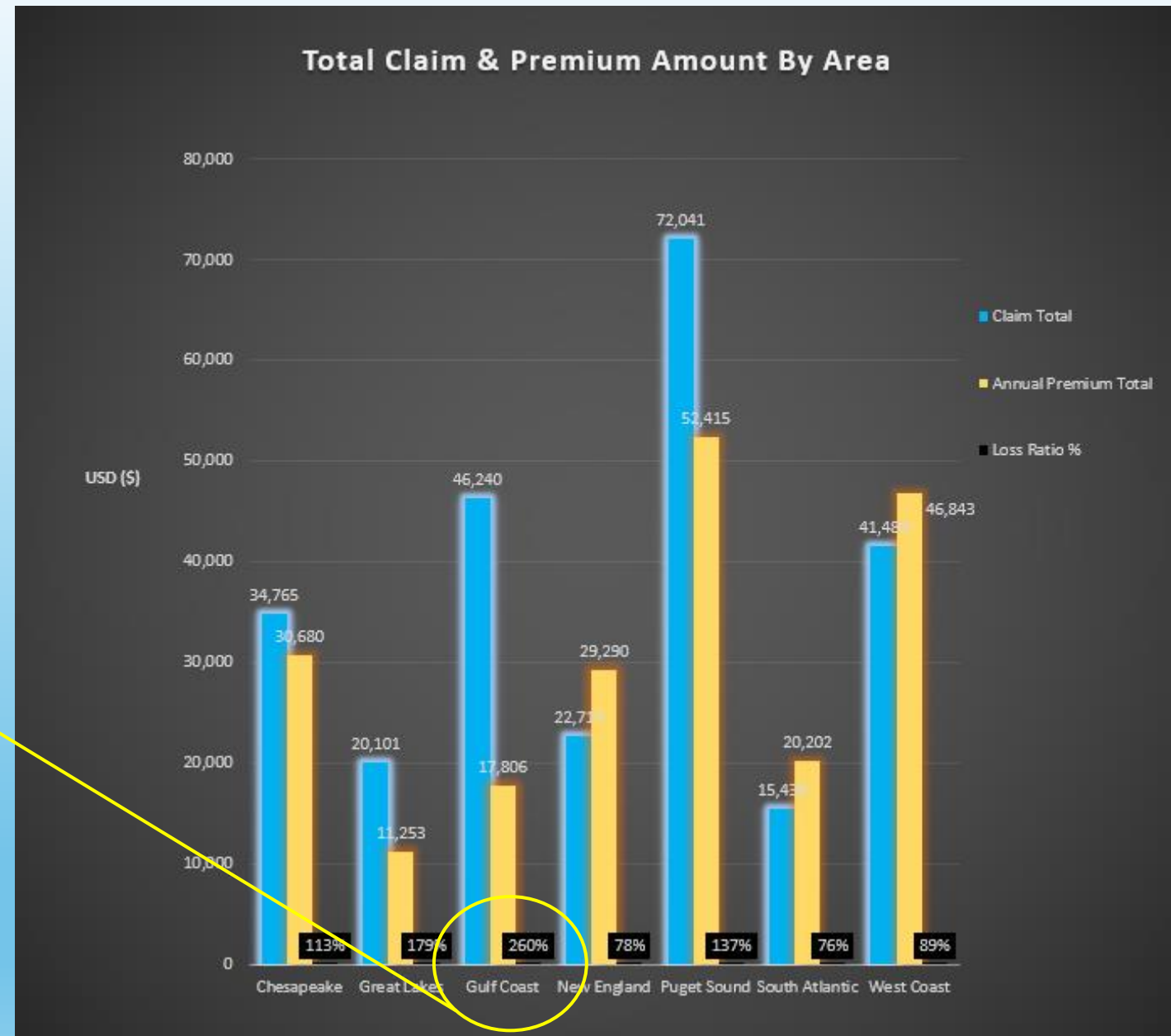
# KPIs from Mock Data:

- ❑ Total Annual Claims Cost: \$998,050
- ❑ Total Annual Earned Premium\*: \$1,247,563
  - ❑ Loss Ratio 2024: 80%
- ❑ # of Marine Claims 2023: 215
- ❑ Exposure Sample Size: 500 Policies

\*All Written Premium is assumed as Earned Premium in this model.

# Key Findings

- ❑ Implementing more stringent underwriting rules regarding previous watercraft operator experience could reduce losses across all regions.
- ❑ Most notably the Gulf Coast region had a 260% Loss Ratio if only policies without similar operator experience were analyzed. Compared to the 110% Loss Ratio aggregate for the Gulf Coast this year.

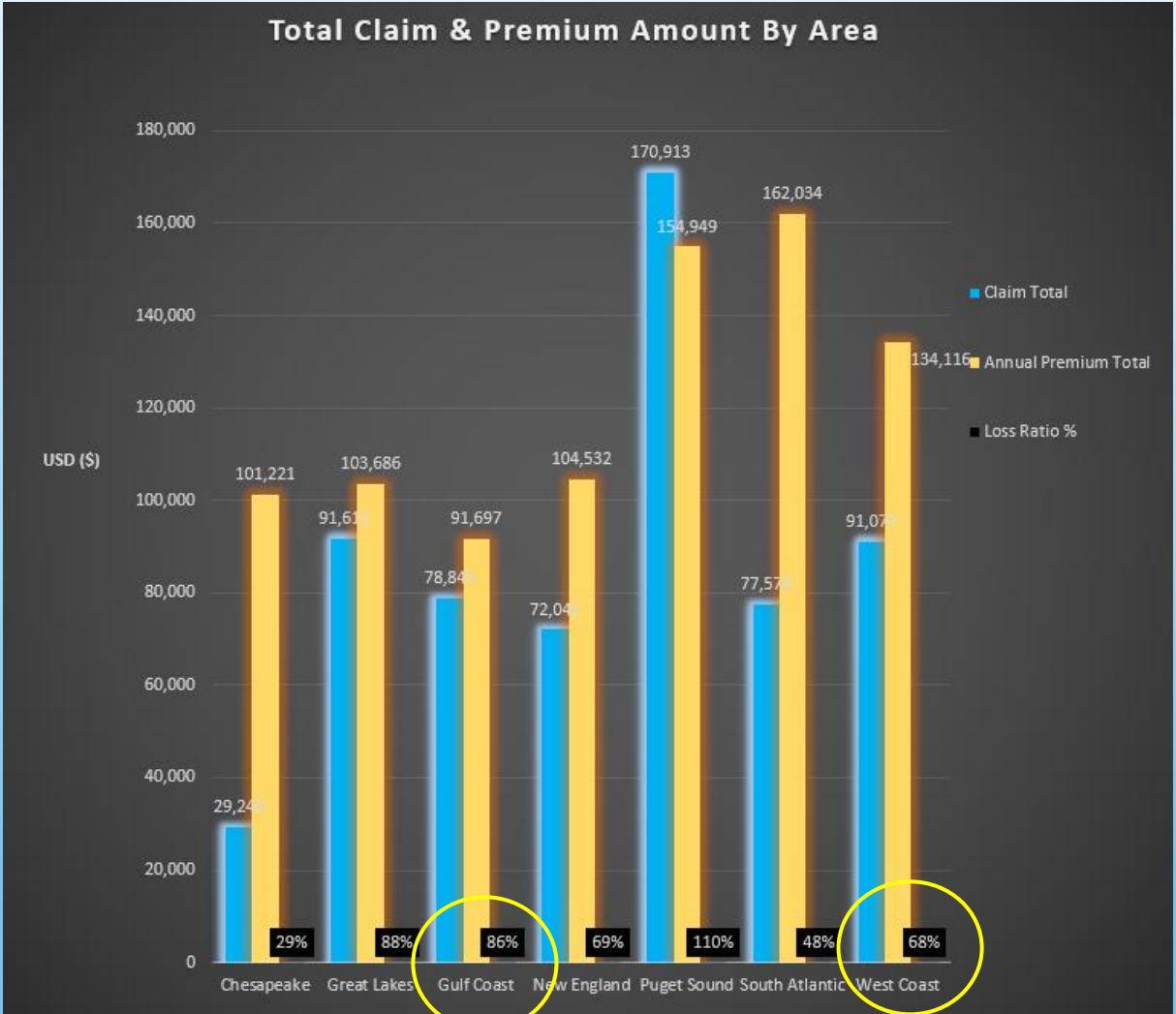


Loss Ratio, given as a % at the bottom, for policies where operators DID NOT have similar size boating experience

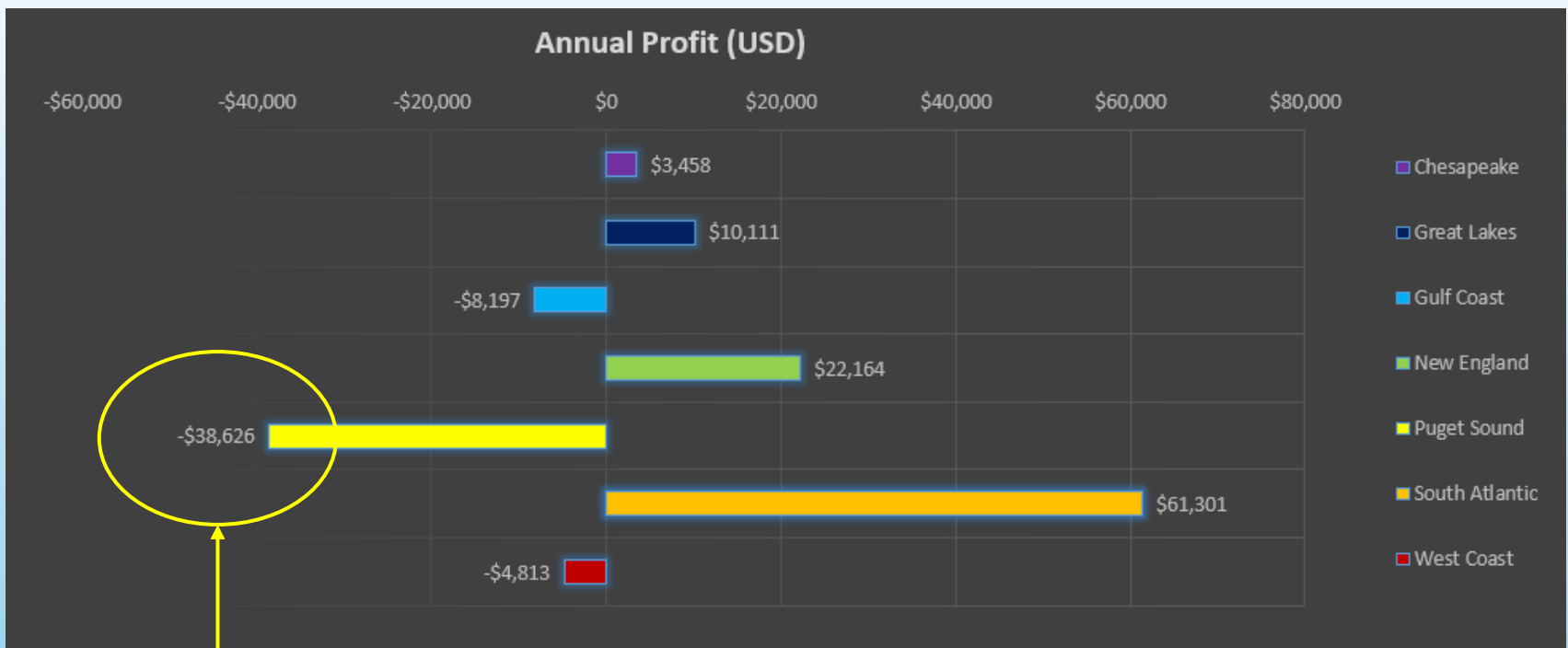
Aggregate for this year



Claim & Premium if only younger boats were considered

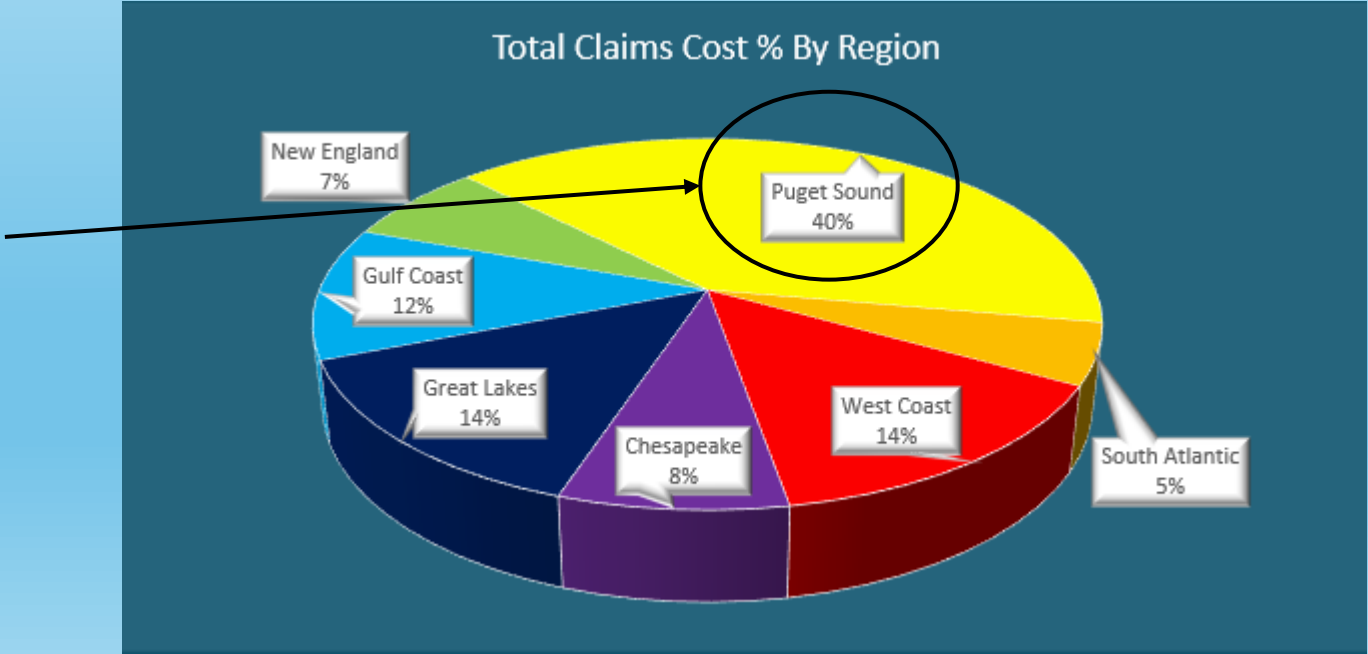


Shifting appetite away from yachts 25 years and older reduces loss ratios in key coastal regions by over 24%.



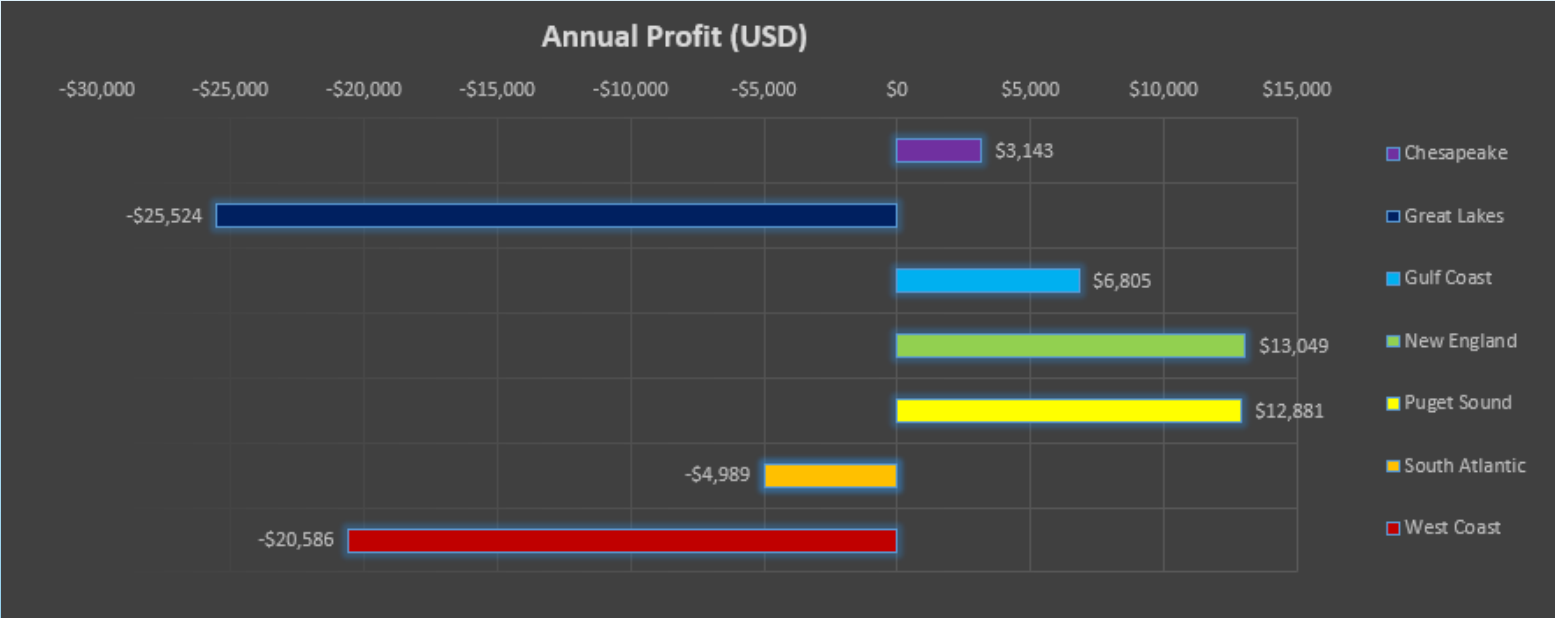
Fiberglass over Wood Policy Data

A regional consideration to the Puget Sound should be given for hull types of fiberglass over wood. Marine Vessels with this hull type had a 232% Loss Ratio, a striking anomaly.





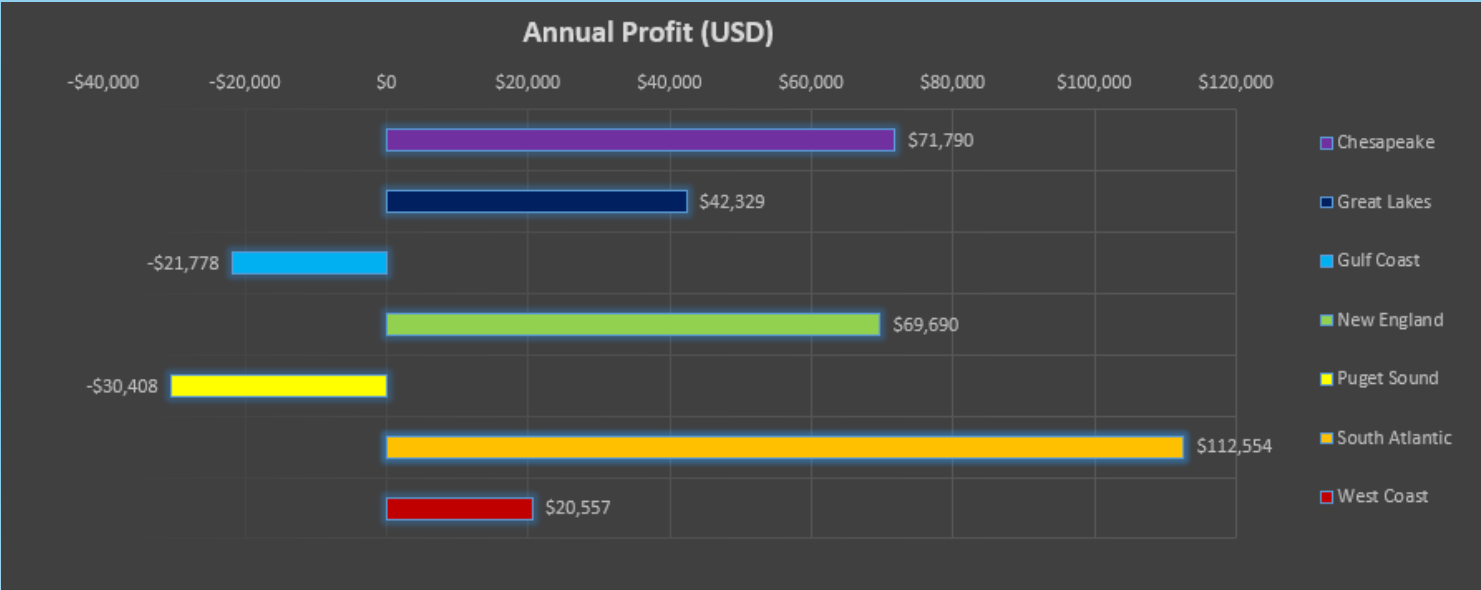
# Profit from Policies with Wood Hulls



Wood hulls generate massive losses in the Great Lakes, South Atlantic, and West Coast regions.

The Gulf Coast appears to do better with wood hulls at first glance however it should be noted there are ONLY 15 policies with wood hulls in this region.

# Profit from Policies without Wood Hulls

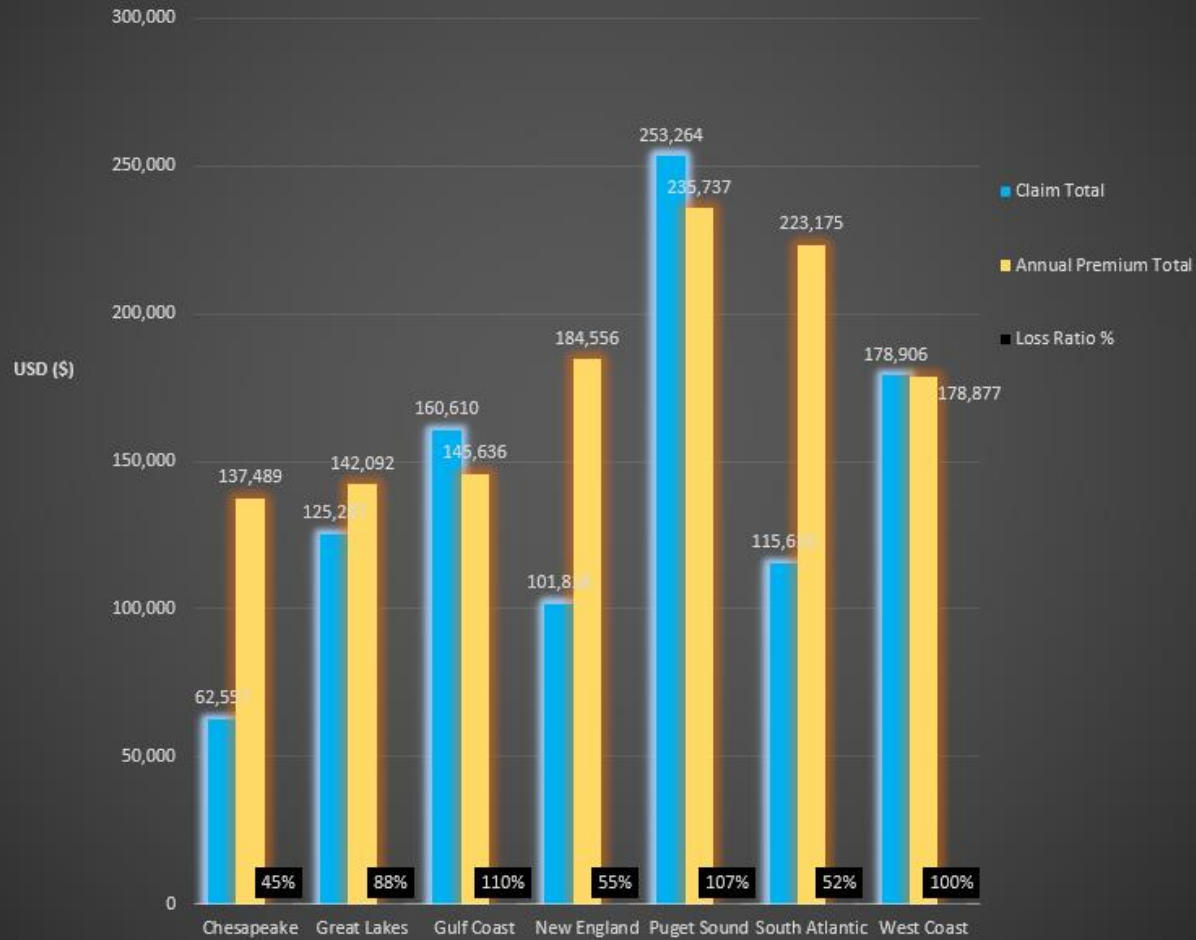


# Underwriting Strategy

## Takeaways

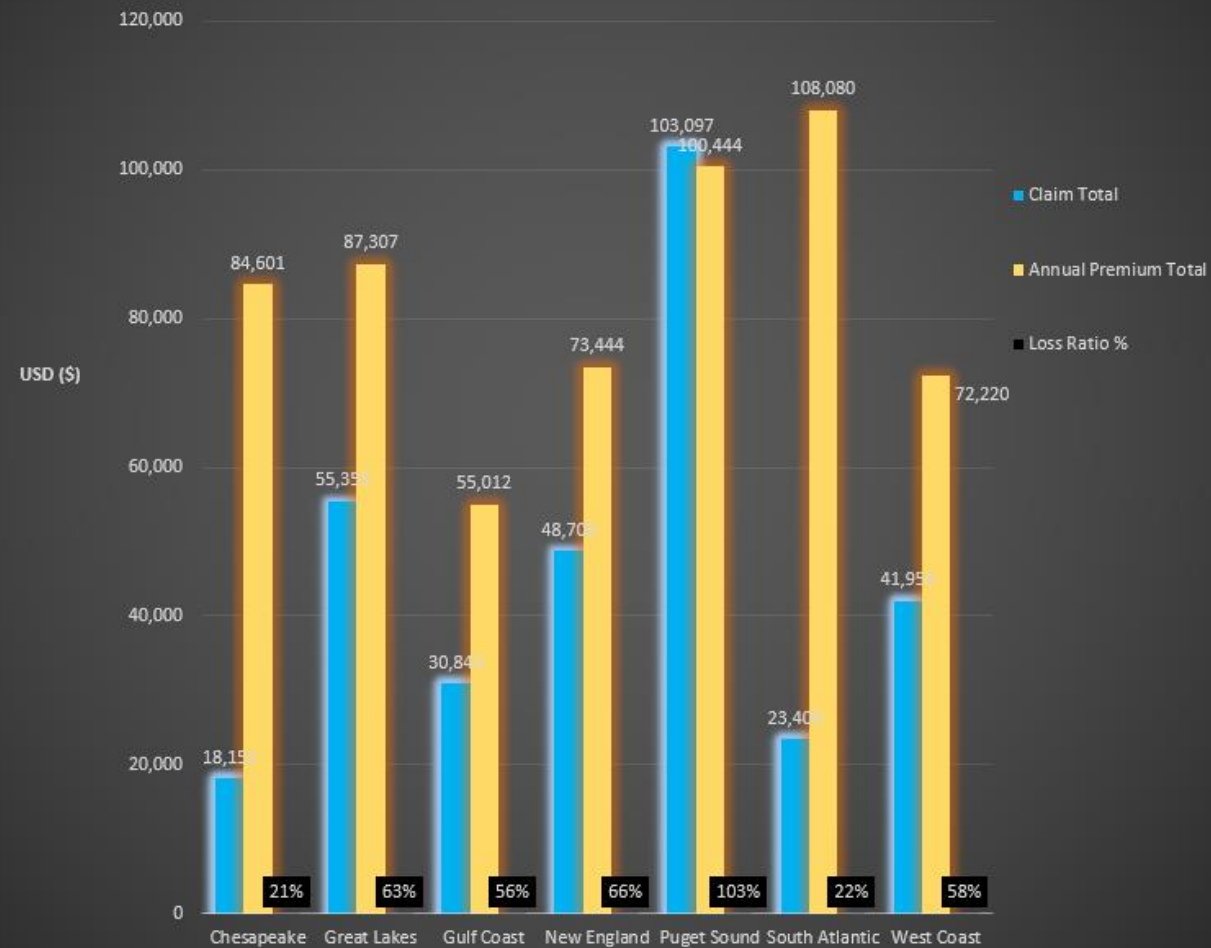
- ☐ Underwrite vessels only if the operator has similar boating experience
- ☐ Avoid boats 25 years and older
- ☐ Avoid insuring vessels with wood hulls

Total Claim & Premium Amount By Area



Actual Claim and Premium Amount 2024

Total Claim & Premium Amount By Area



What Claim and Premium Amount Would look like if suggested underwriting strategy was implemented in 2024

# Key Takeaways

- ❑ With these underwriting strategies taken under consideration, we would have went from a Loss Ratio of 80% → A Loss Ratio of 55%.
- ❑ That 55% Loss Ratio for Marine Vessels is approximately in line with Travelers Direct Loss to EP Ratio for 2024 according to the NAIC .
- ❑ This underwriting strategy should be implemented for the 2025 fiscal year, and monitored for improved trends and performances
- ❑ The Puget Sound should be further investigated in relation to its Fiberglass over Wood claims. Was that trend specific to 2024, or perhaps with more data a more regular trend can be established and we can adjust underwriting appetite accordingly.



# Sources

**Boat Image Background:**

<https://www.autoevolution.com/news/1920-classic-yacht-previously-owned-by-royalty-is-a-2-million-piece-of-history-199356.html>

**NAIC Data:**

<https://content.naic.org/sites/default/files/research-actuarial-property-casualty-market-share.pdf>