Climate Change Impact on Marine Resources and Business Impact ～Alaska Pollock (Bering Sea) and Anchovy (Peru Coast)～

August 29, 2025

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Business Impact Assessment Targets

As part of our TCFD scenario analysis, we focused on the following two fish species to estimate changes in marine resources and financial impact:

① Alaska Pollock in the Bering Sea - the largest volume of wild fish procurement for our group

② Anchovy off the coast of Peru - primarily used as raw material for aquaculture feed

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Assessment Tools

The tools and conditions used for future resource volume prediction data are as follows:

- **Climate Scenarios: RCP8.5 (4°C scenario), RCP2.6 (below 2°C scenario)**
- **Domain: Global**
- **Spatial Resolution: 1 degree in both north-south and east-west directions (approximately 100km)**
- **Data Used: ISIMIP (*1)**
- **Analysis Years: 2030, 2050**
- **Global Climate Models: GFDL-ESM2M, IPSL-CM5A-LR (2 models)**
- **Fisheries Model: BOATS (*2)**
- **Resource volumes were predicted by dividing adult fish into three categories based on total length: ① 30cm or less, ②30cm to 90cm, ③90cm or more, with total weight per unit area (unit: gC/m²). Values were determined visually from color gradations on respective maps.**
- **Cooperation: Weathernews Inc.**

*1: ISIMIP (Inter-Sectoral Impact Model Intercomparison Project) - An international project investigating climate change impacts across various sectors including agriculture, fisheries, biodiversity, and water cycles

*2: BOATS - A fish distribution model that analyzes and evaluates total catch and resource volume per unit area according to the three body length categories mentioned above

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1.-1） Sea Surface Temperature Changes in 2050 Compared to 2030 Below 2°C Scenario

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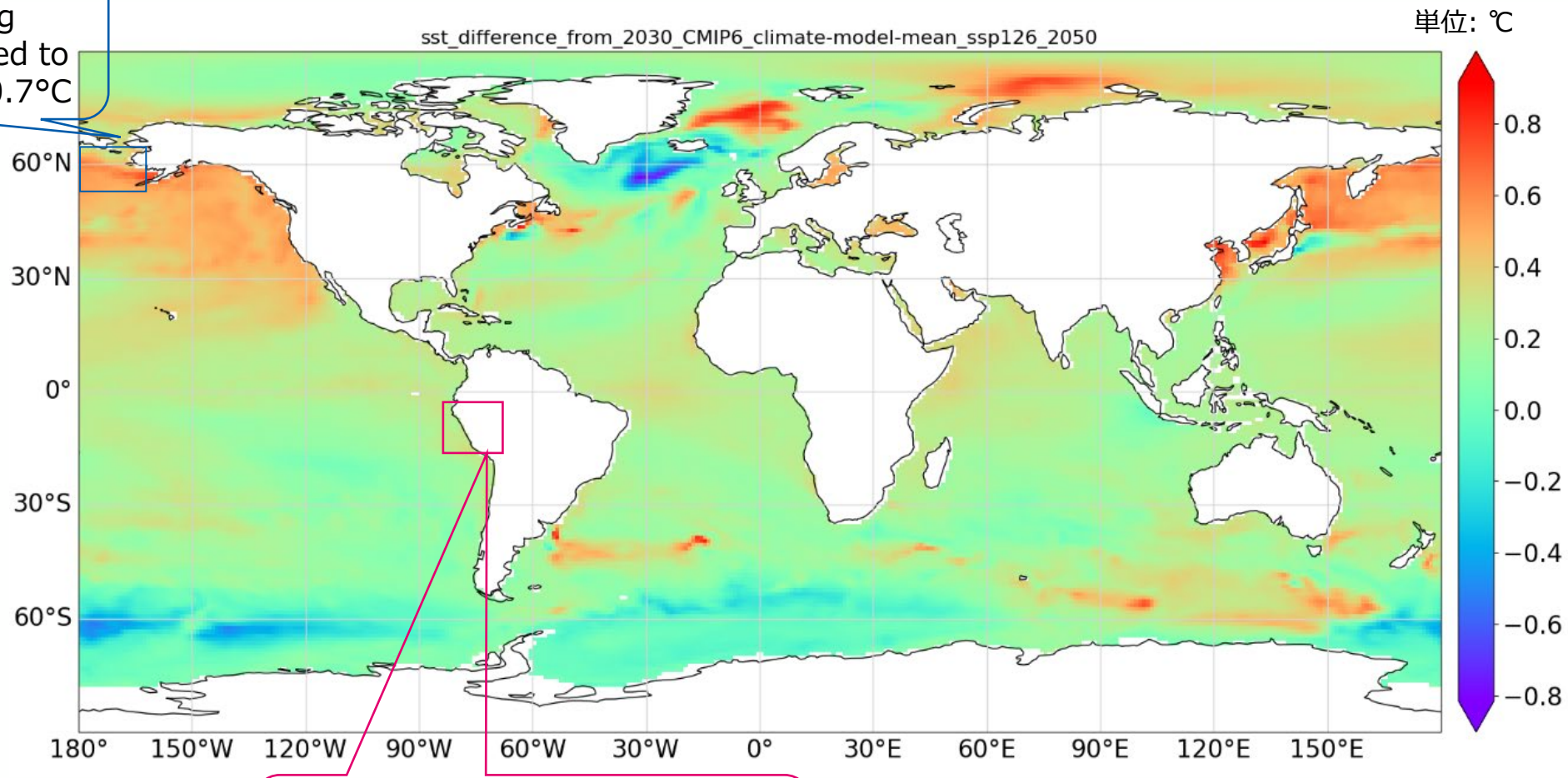
Bering Sea Alaska Pollock Fishing Grounds: Analyzed to increase by 0.5-0.7°C



Peru Coast Anchovy Fishing Grounds: Analyzed to increase by 0.2-0.4°C

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1.-2） Sea Surface Temperature Changes in 2050 Compared to 2030 4°C Scenario

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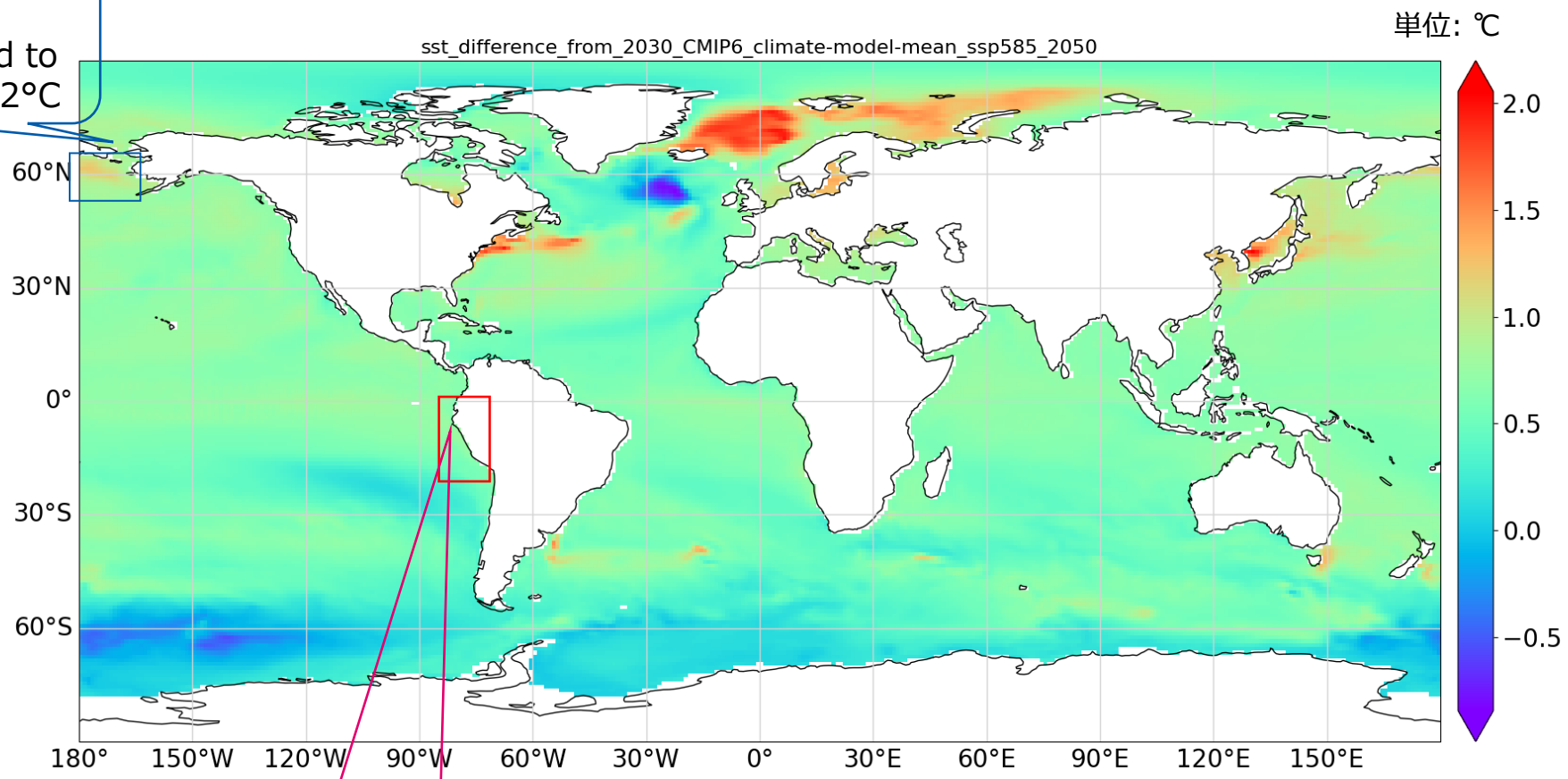
Bering Sea Alaska Pollock Fishing Grounds: Analyzed to increase by 0.8-1.2°C



Peru Coast Anchovy Fishing Grounds: Analyzed to increase by 0.6-1.0°C

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2. -1）Alaska Pollock Resource Volume Changes in 2050 Compared to 2030 Below 2°C Scenario / With Fishing

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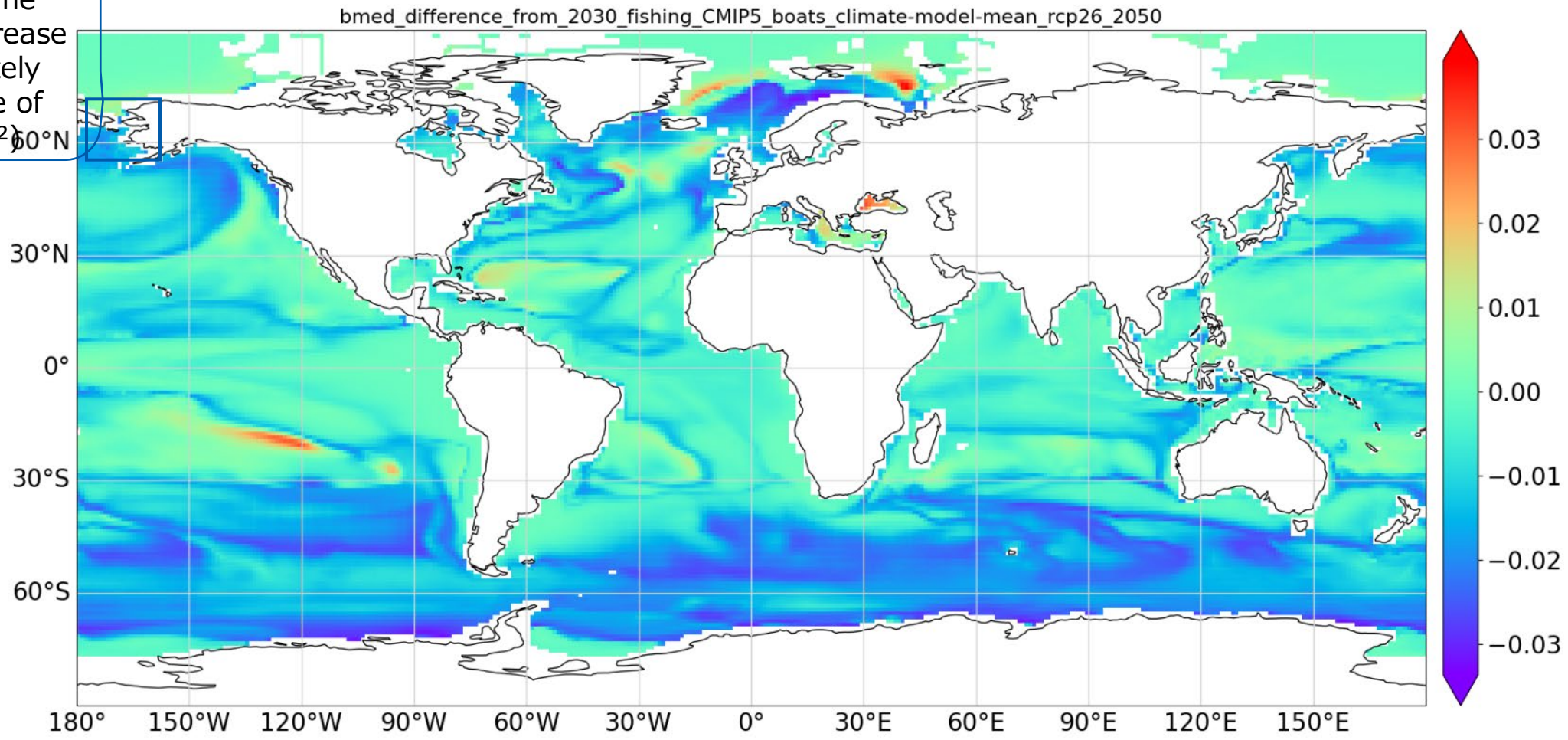
Alaska Pollock resource volume analyzed to decrease by approximately 11% (decrease of 0.0075gC/m²)

単位: gC/m²



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2. -2) Alaska Pollock Resource Volume Changes in 2050 Compared to 2030
4°C Scenario / With Fishing

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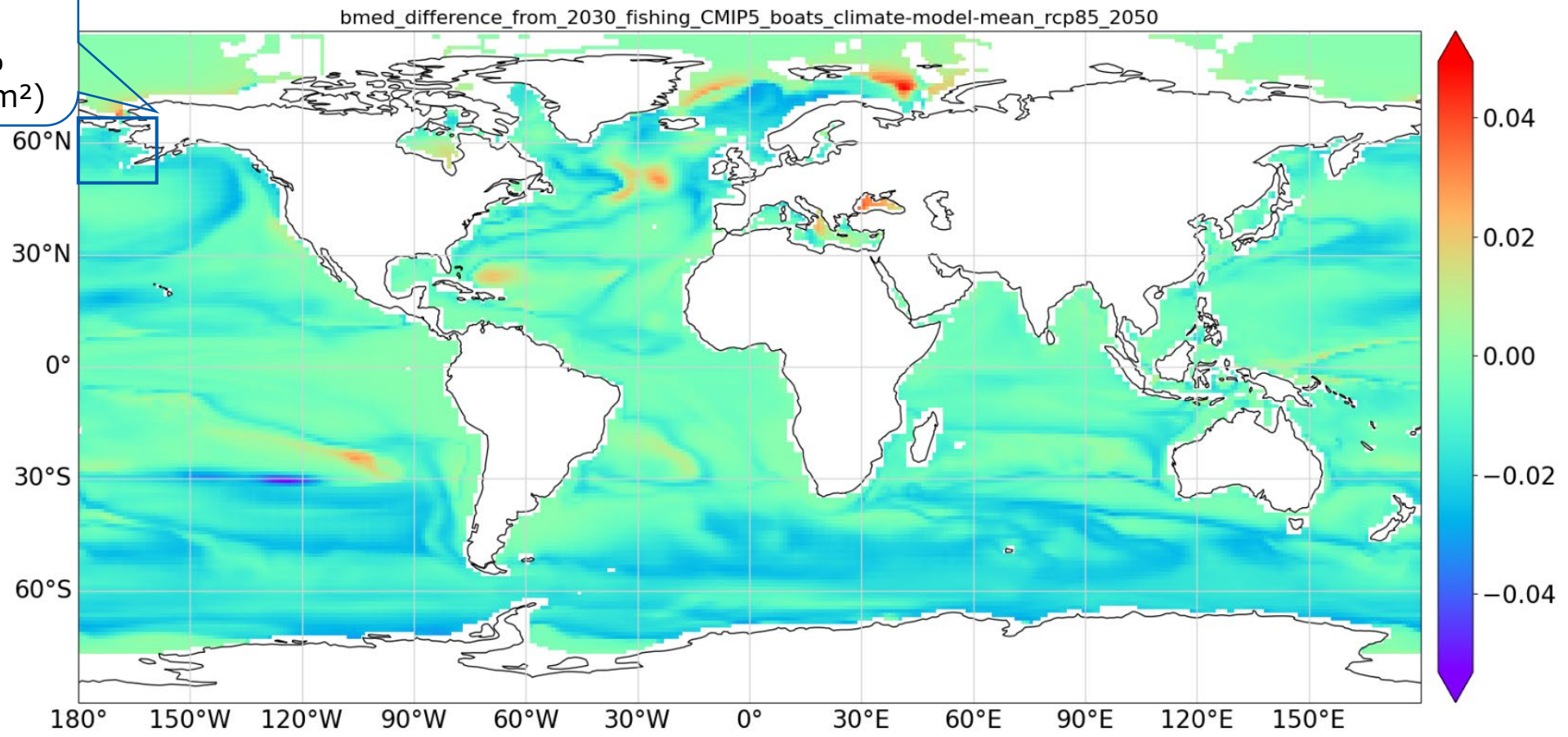
Alaska Pollock resource volume analyzed to decrease by approximately 13% (decrease of 0.01gC/m²)

単位: gC/m²



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2. -3）Peru Anchovy Resource Volume Changes in 2050 Compared to 2030 Below 2°C Scenario / With Fishing

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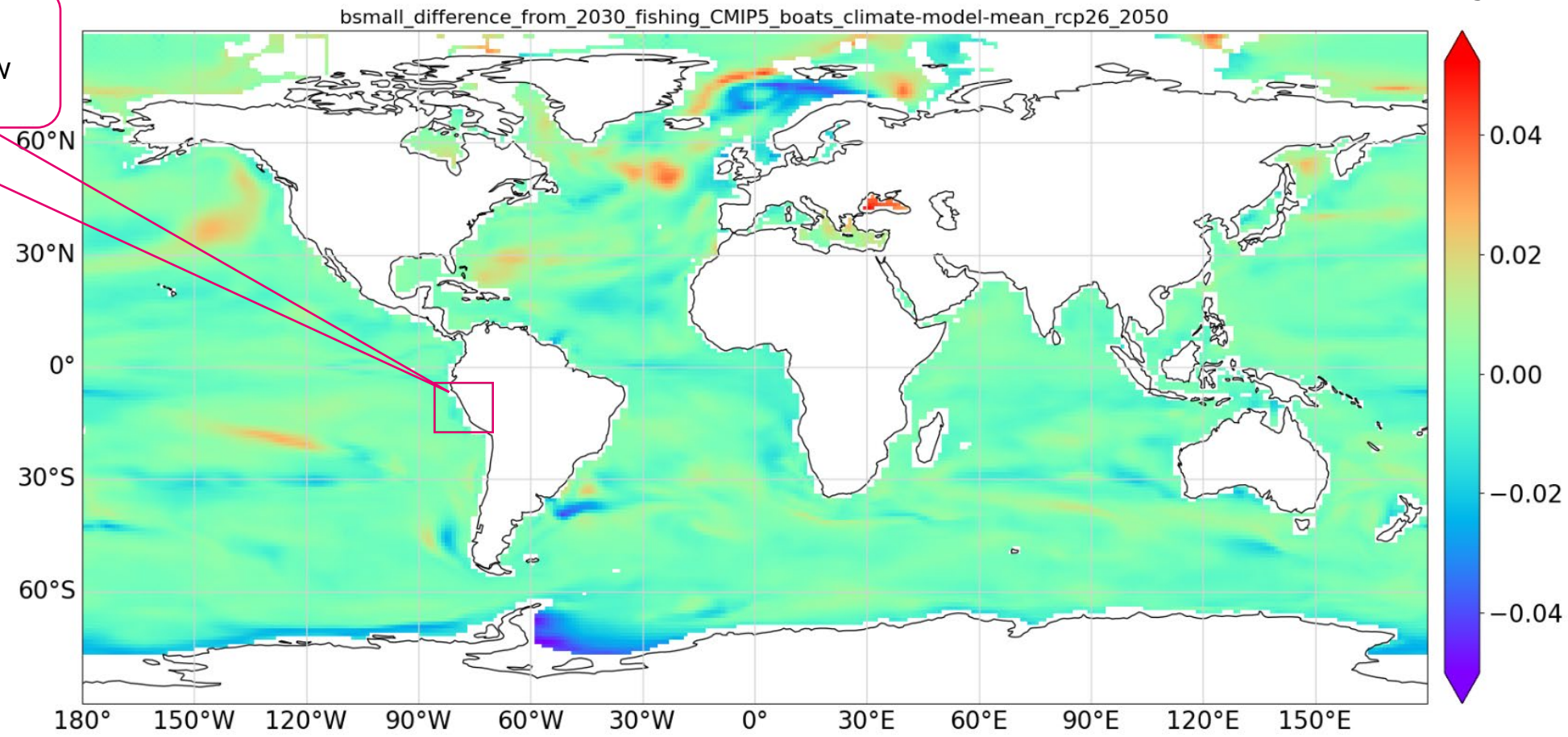
Peru Anchovy resource volume analyzed to show virtually no change

単位: gC/m²



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2. -4）Peru Anchovy Resource Volume Changes in 2050 Compared to 2030
4°C Scenario / With Fishing

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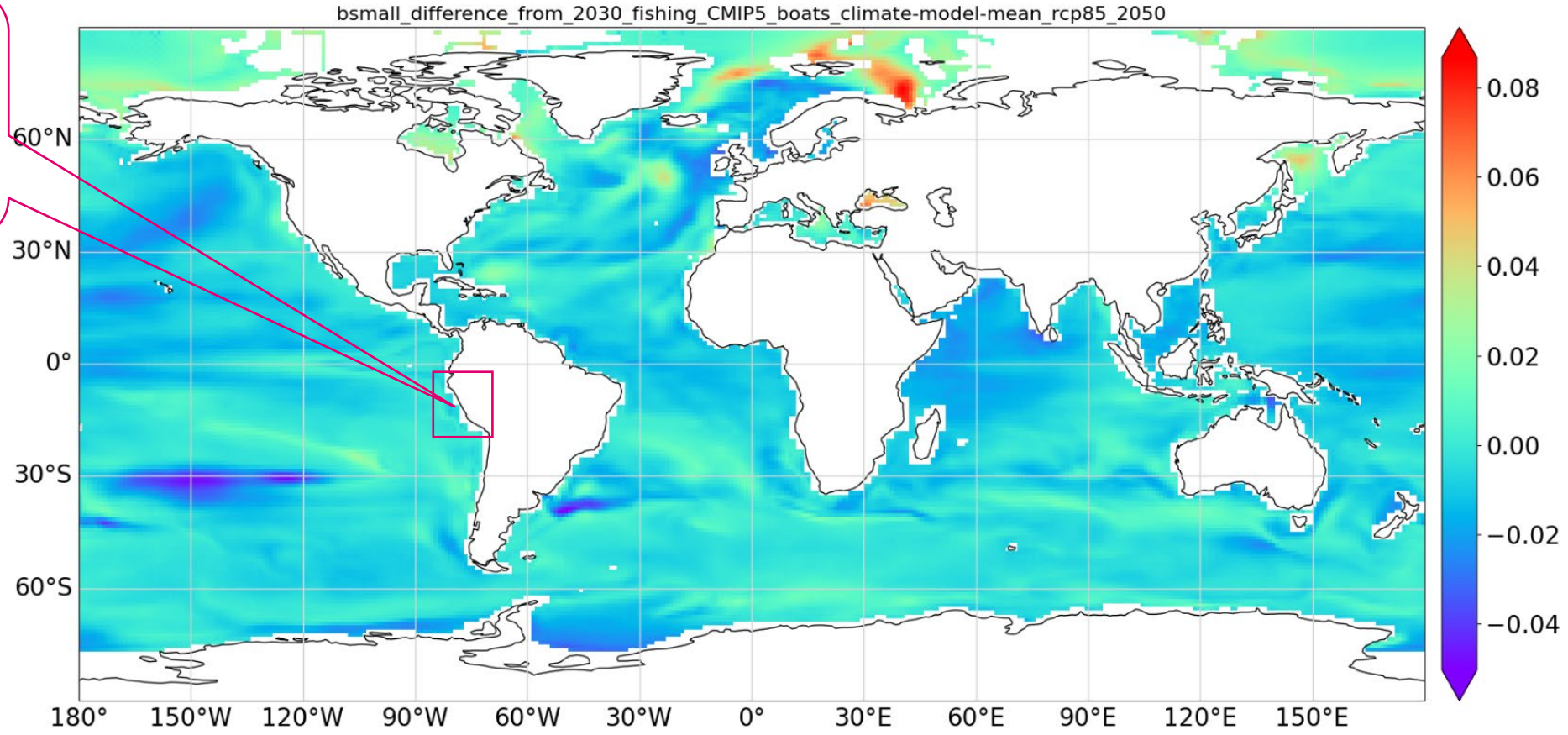
Peru Anchovy resource volume analyzed to show virtually no change, similar to the below 2°C scenario, even in the 4°C scenario

単位: gC/m²



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3. Resource Volume Changes and Financial Impact Estimation

Sea Area/Species	Scenario	海面水温	2030年→2050年 資源量変化	財務的影響 (億円)	
				項目	金額
Bering Sea Alaska Pollock	Below 2℃ scenario	0.6℃ increase	11% decrease	Revenue	**51**
	4°C scenario	1.1℃ increase	13% decrease		**60**
Peru Coast Anchovy	Below 2℃ scenario	0.3℃ increase	No change	Procurement cost	**0**
	4℃ scenario	0.8℃ increase	No change		**0**

- The resource volume change maps 2-1) through 4) are predictions of future changes using BOATS, incorporating fishing volumes from economic activities and dividing fish into three size categories.
- Alaska Pollock resource volume analysis shows approximately 11% decrease in the below 2-degree scenario and approximately 13% decrease in the 4-degree scenario. Financial impact analysis indicates revenue decreases of approximately 5.1 billion yen in the below 2-degree scenario and approximately 6.0 billion yen in the 4-degree scenario.
- **However, Alaska fisheries management sets allowable catch quotas significantly below biological allowable catch levels, so resource volume decreases may not directly translate to catch volume decreases.**
- Anchovy resource volume shows no change in both below 2-degree and 4-degree scenarios, resulting in no financial impact.

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4. Resource Volume Changes and Financial Impact Estimation (Summary)

- This investigation analyzed that Alaska Pollock in the Bering Sea will experience resource volume decreases of over 10% in both below 2°C and 4°C scenarios.
- Peru Anchovy showed no resource volume changes in both below 2°C and 4°C scenarios.
- Based on these results, we will consider countermeasures while expanding scenario analysis to other areas and fish species.

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Thank You

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