

INTERNATIONAL PACIFIC



HALIBUT COMMISSION

# Space-time modelling of survey data

Agenda item: 5.1

IPHC-2023-IM099-09 Rev\_1

(R. Webster)



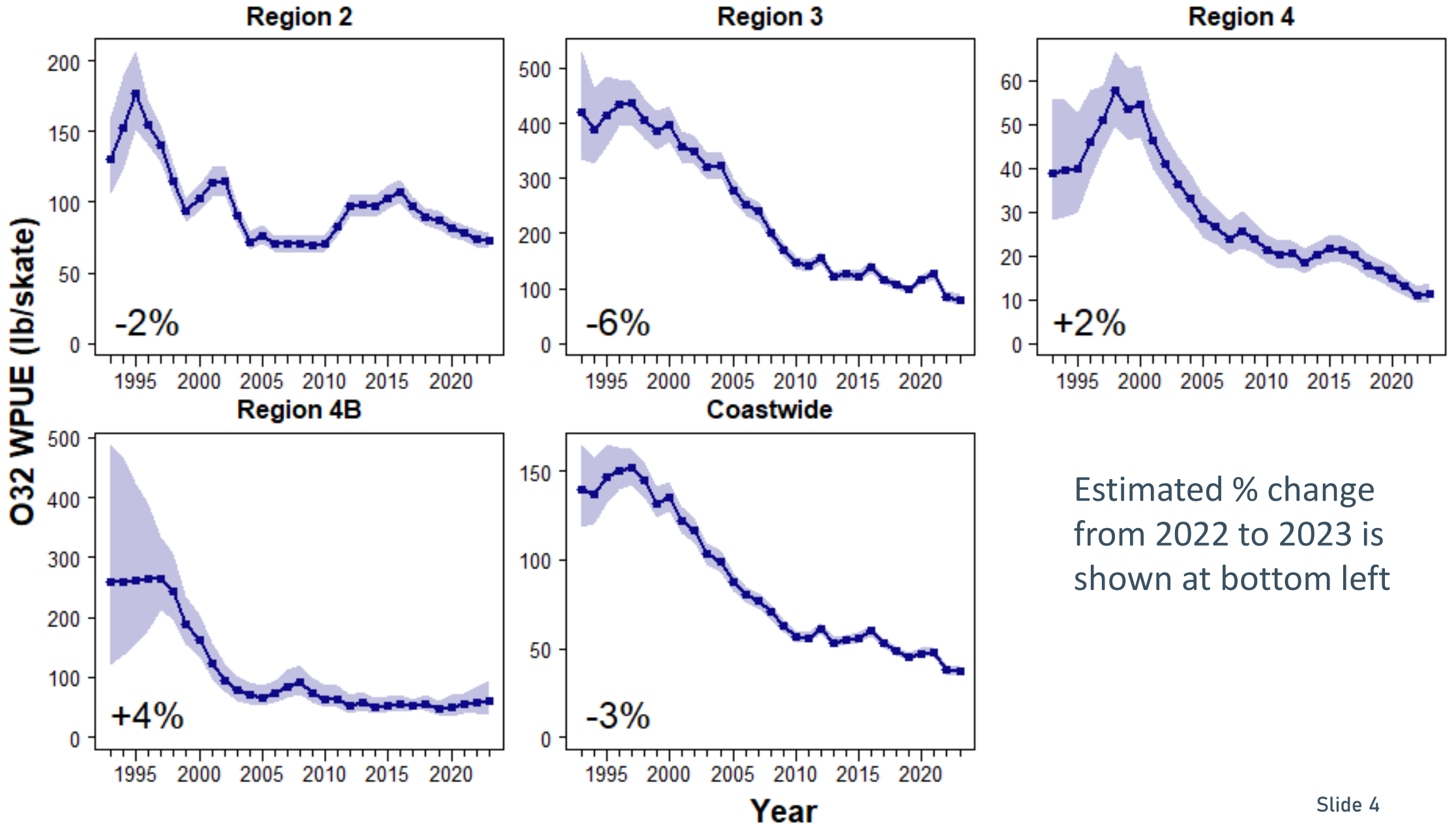
# Space-time model estimates of WPUE and NPUE

- As in 2016-22, space-time modelling was used to estimate O32 and all sizes WPUE, and all sizes NPUE indices from 1993 onwards
  - For IPHC Regulatory Areas 4A and 4CDE, modelling uses data from the FISS and agency trawl surveys (NMFS, ADFG)
    - A calibration is used to convert trawl data to FISS equivalent
  - Other areas use FISS data only
  - Raw station data are adjusted for hook competition and timing of FISS relative to the fishery

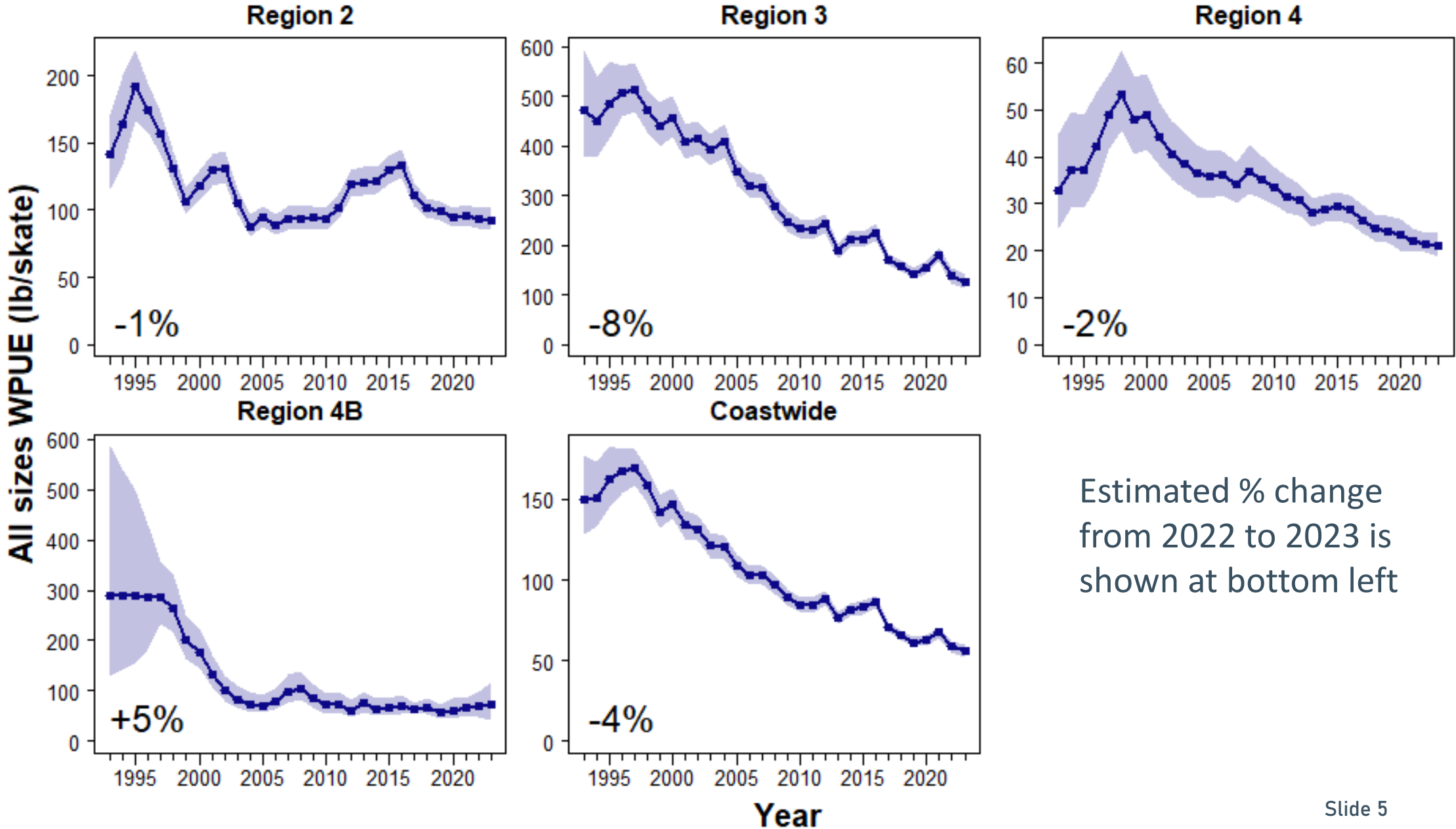
# Space-time model estimates of WPUE and NPUE

- The models predict WPUE and NPUE at all grid stations, whether they were surveyed in a given year or not
  - Estimates are calculated as averages across station predictions
  - Lack of sampling or reduced sampling is reflected in greater uncertainty (higher variances, CVs)
- Official estimates are computed for:
  - Biological Regions
  - IPHC Regulatory Areas
  - Coastwide IPHC Convention waters, from San Francisco Bay to Bering Strait
- Station-level output is supplied to the online IPHC Space-time Explorer tool

# O32 WPUE by biological region

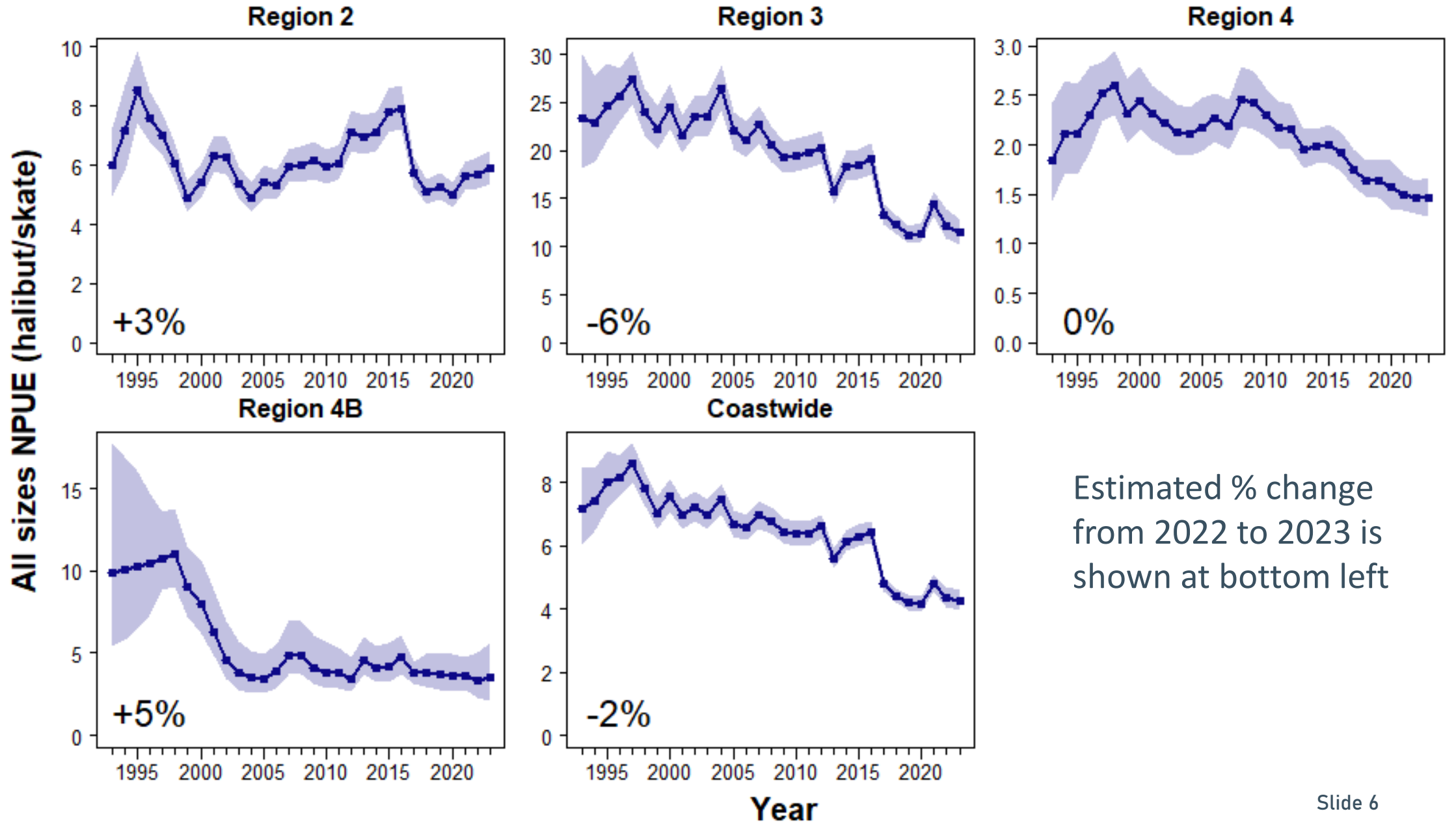


# All sizes WPUE by biological region



Estimated % change from 2022 to 2023 is shown at bottom left

# All sizes NPUE by biological region



Estimated % change from 2022 to 2023 is shown at bottom left

# Snap gear in IPHC Regulatory Area 3A

- In 2023, one vessel fished snap gear in two charter regions in IPHC Regulatory Area 3A
- These data are included in the space-time modelling along with data from a 2021 gear comparison experiment in a different charter region fished by a different vessel.
- The additional data have allowed us to revise estimates of the ratio of catch rates between the two gear types in IPHC Regulatory Area 3A and reduced uncertainty in those estimates.

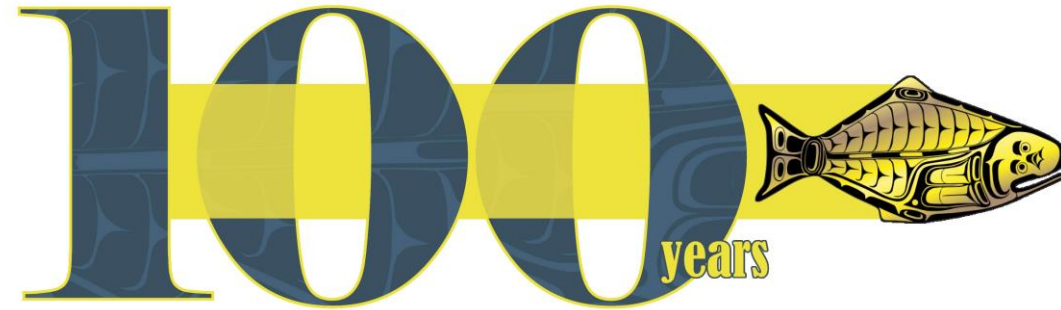
Variable	Ratio of snap to fixed catch rate			
	2021 study		2023 modelling	
	Posterior mean	95% credible interval	Posterior mean	95% credible interval
<b>O32 WPUE</b>	1.28	0.96 – 1.72	0.97	0.81 – 1.17
<b>All sizes WPUE</b>	1.18	0.89 – 1.56	1.08	0.90 – 1.30
<b>All sizes NPUE</b>	1.43	1.08 – 1.89	1.15	0.95 – 1.39



# Recommendation

That the Commission **NOTE** paper IPHC-2023-IM099-09 Rev\_1 which provides results of the space-time modelling of Pacific halibut survey data for 1993-2023.

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