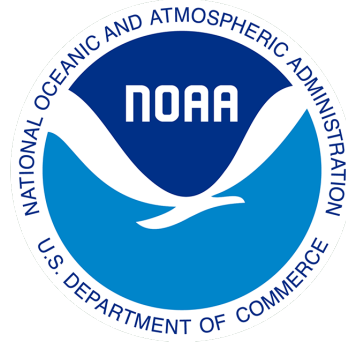




GOA Demersal Shelf Rockfish

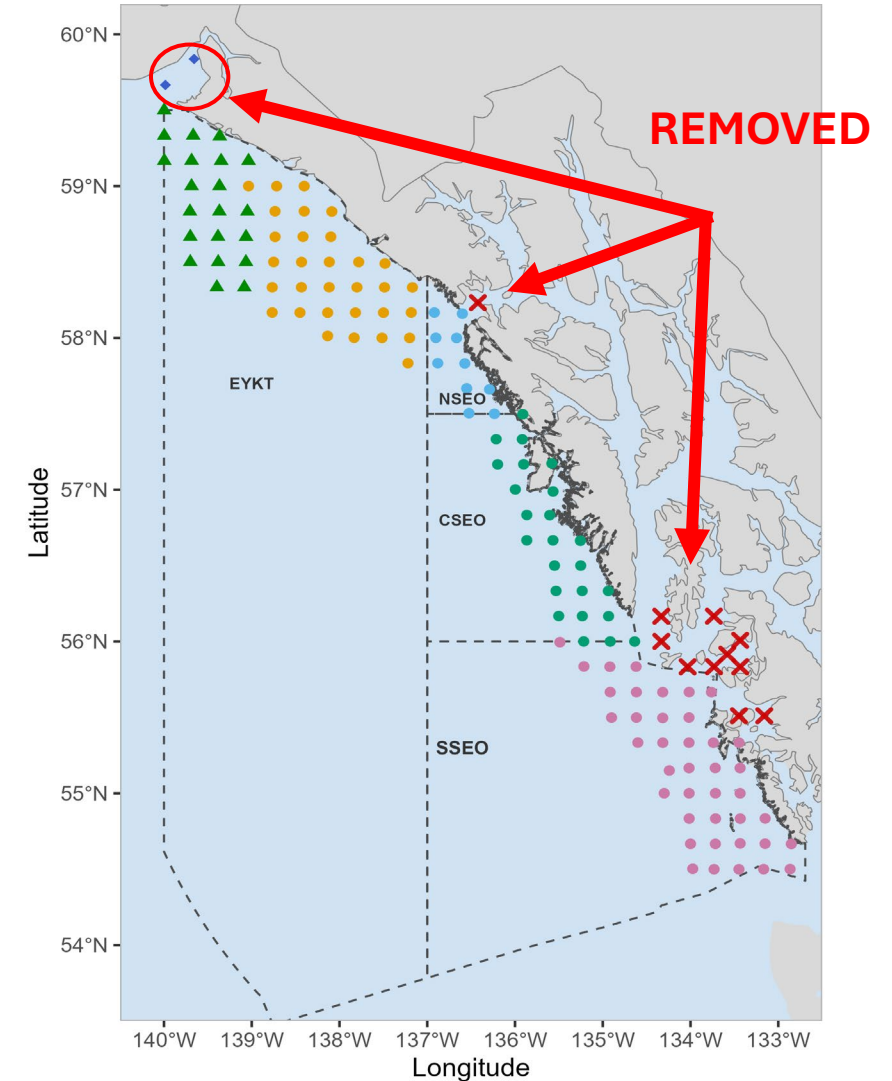
Presentation for SSC

Aaron Lambert, Caitlin Stern, Laura Coleman, Rhea Ehresmann,
Kristin Omori, Christine Hinds, and Bridget Ferriss



Changes to the input data

- IPHC survey data updated to 2025
 - **13 stations removed from SEO**
 - Found to be outside of SEO boundary
- **No new** ADFG ROV survey data
 - New ROV was purchased
 - Mechanical issues
 - Possible solutions:
 - State-wide ADF&G ROV (FY2028)
 - Semi-Autonomous Towed Camera System

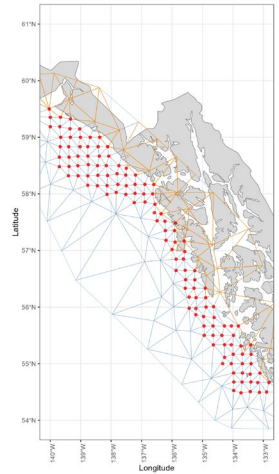


Proposed SEO Yelloweye (Tier 5) Model Changes

- IPHC CPUE Spatiotemporal Standardization
- Motivated by 2024 GOA GPT comments and reduced IPHC survey stations in SEO in 2024 and 2025
 - All 4 management units below average
 - No EYKT in 2024, only 3 stations in 2025
 - No NSEO in 2025
 - Share information across time and space
 - May produce more stable index of abundance

Year	CSEO	EYKT	NSEO	SSEO
1998	15	48	8	37
1999	18	47	8	36
2000	18	46	6	34
2001	16	47	8	34
2002	19	49	8	33
2003	19	46	8	34
2004	18	47	8	34
2005	17	48	7	36
2006	19	49	8	33
2007	19	50	8	34
2008	18	48	7	35
2009	18	47	7	35
2010	18	44	8	35
2011	18	48	6	31
2012	16	48	8	34
2013	16	45	8	35
2014	17	47	6	35
2015	17	48	5	32
2016	18	47	8	34
2017	18	48	7	34
2018	20	44	6	41
2019	20	41	9	37
2020	22	49	8	40
2021	20	41	7	39
2022	21	27	5	16
2023	21	47	9	39
2024	14	NA	4	28
2025	6	3	NA	24
Mean	17.7	44.4	7.2	33.9

Spatiotemporal Standardization



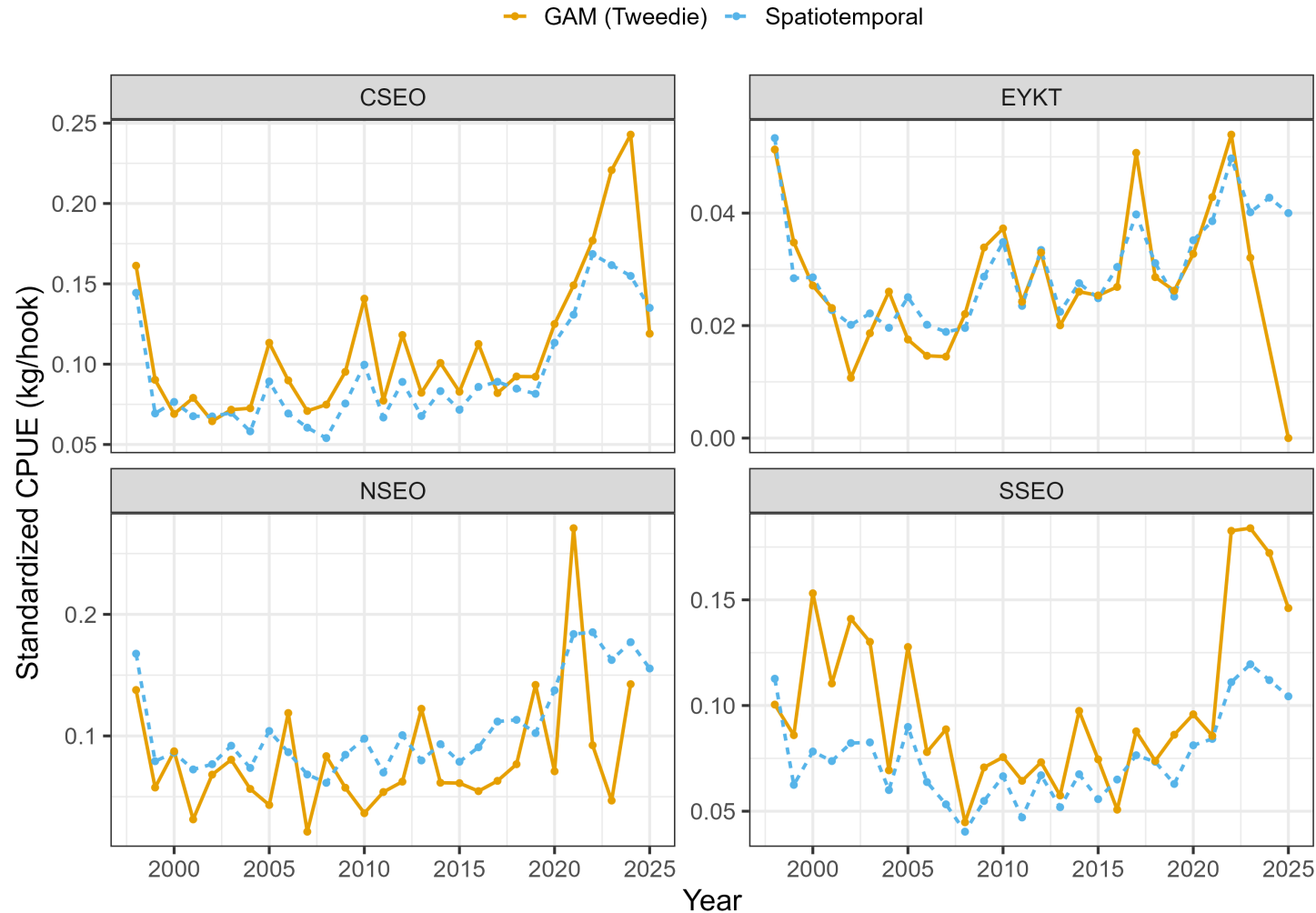
- 7 Candidate models
- Tweedie error distribution
- Either AR1 or IID spatiotemporal structure
- One model with no spatiotemporal component
- All with combination of depth and/or soak time (or neither)
- Fit to entire SEO area
- Model selection using cross-validation and AIC
- Predicted to each management area separately to get indices

Model	Spatiotemporal structure	Depth smooth	Soak smooth
M1	IID	Yes	Yes
M2	AR(1)	Yes	Yes
M3	None	Yes	Yes
M4	IID	Yes	No
M5	IID	No	Yes
M6	AR(1)	No	No
M7	AR(1)	Yes	No

Parameter	Estimate	SE	Lower 95 pct	Upper 95 pct
Spatial range (km)	44.933	6.957	33.172	60.862
Tweedie dispersion (phi)	0.134	0.009	0.117	0.154
Spatial SD (sigma_O)	2.435	0.261	1.973	3.005
Spatiotemporal SD (sigma_E)	0.316	0.043	0.243	0.412
Tweedie power (p)	1.246	0.012	1.223	1.269
AR(1) correlation (rho)	0.616	NA	0.203	0.842
Depth smooth SD	15.138	NA	5.332	42.977
Soak smooth SD	0.001	NA	0.000	NA

sdmTMB vs. GAM Indices

- Highly correlated with GAM index
 - CSEO ($r=0.94$); EYKT ($r=0.91$); SSEO ($r=0.78$)
- Weaker agreement in NSEO ($r=0.53$)
 - GAM shows greater interannual volatility from small sample sizes
- EYKT: GAM index collapses to zero in 2025 (3 stations, all zero-catch)
- **We recommend the sdmTMB standardization for 2026 assessment**

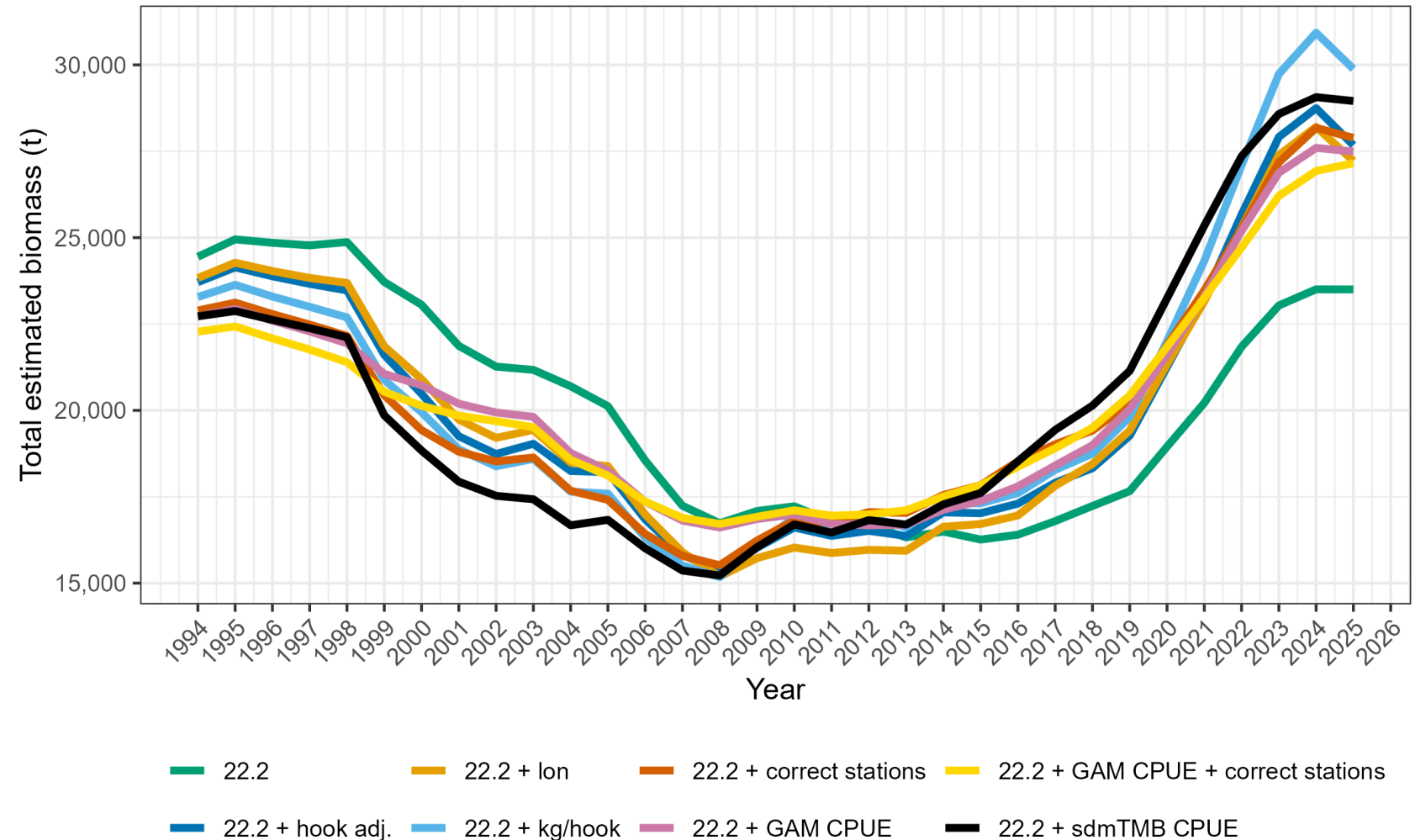


Bridging Analysis: Changes to IPHC Index

Step Number	Step	Station set	CPUE units	Hook adj.	EYKT boundary
1	22.2 (2022 Accepted Model)	Non-zero	numbers/ hook	No	137°W
2	+ hook adj.	Non-zero	numbers/ hook	Yes	137°W
3	+ lon	Non-zero	numbers/ hook	Yes	140°W
4	+ kg/hook	Non-zero	kg/hook	Yes	140°W
5	+ GAM CPUE (2024 Accepted Model)	All ≤ 250 fm	kg/hook	Yes	140°W
6	+ 2026 corrected stations	Non-zero	kg/hook	Yes	140°W, 59.5°N
7	+GAM CPUE + 2026 corrected stations	All ≤ 250 fm	kg/hook	Yes	140°W, 59.5°N
8	+ sdmTMB CPUE (2026 recommended)	All ≤ 250 fm	kg/hook	Yes	140°W, 59.5°N

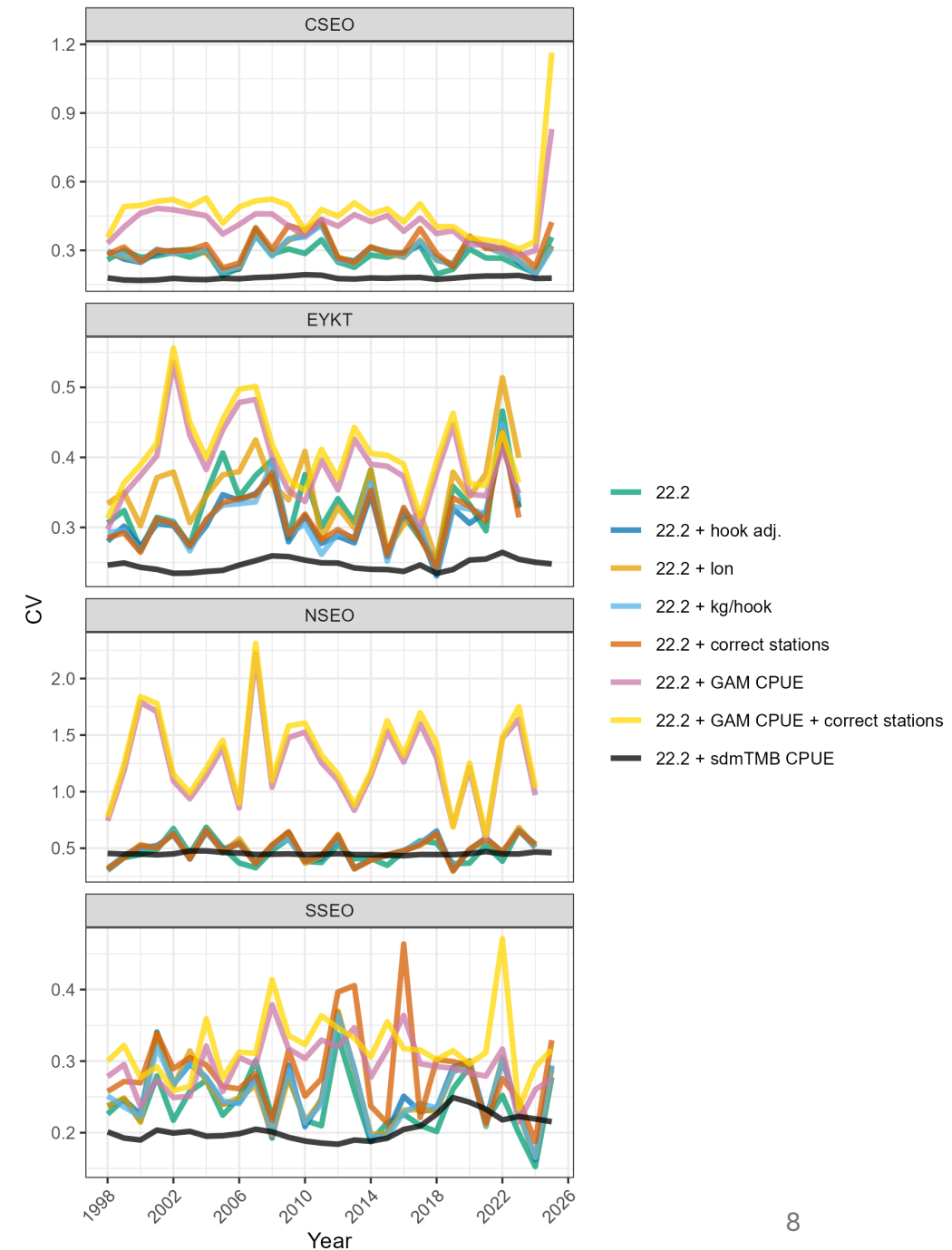
Bridging Results: Total SEO Biomass

- All updated methods increase biomass relative to the 2022 model (22.2; **Green**)
- Largest change: hook adjustment + kg/hook conversion (23,501 → 29,881; **Blue**)
- Station correction reduces biomass relative to the kg/hook step – removed productive stations (**Yellow** and **Red**)
- Differences most pronounced 2022–2025, coinciding with reduced IPHC survey effort



CV Sensitivity Analysis

- sdmTMB CVs (SE/mean across prediction grid cells) are smaller and less variable across years than bootstrap- or GAM-derived CVs
- Increased index precision is an expected property of spatiotemporal standardization (Fuster-Alonso et al. 2024)
- Does this added precision appropriately inform the REMA fit, or over-weight the CPUE index relative to the ROV survey?
- To see the effect:
 - scaled sdmTMB CVs by multipliers of 1–5
 - Mean CV of all non-sdmTMB bridging indices



CV Sensitivity Analysis: Results

CV Scenario	Biomass (t)	YE OFL (t)	YE maxABC (t)
sdmTMB CV ×1 (base, recommended)	28,955	579	434
sdmTMB CV ×2	24,518	490	368
sdmTMB CV ×3	21,111	422	317
sdmTMB CV ×4	20,122	402	302
sdmTMB CV ×5	19,801	396	297
CV = mean of other indices	27,052	541	406

We recommend CV (×1) but request SSC guidance on whether it is appropriate for harvest specifications, or whether a more conservative assumption is warranted

Tier 5 and 6 questions for **future assessments**

- No new ROV survey since 2023
- Reduced IPHC survey
- Example criteria:
 - 3+ consecutive years with no IPHC survey in a specific management unit
 - A reduction below 50% of the current station historical average across the SEO for three consecutive years
 - REMA model convergence issues related to IPHC index fit (Hessian or gradient failures)

Quantity	Tier 5 (recommended)	Tier 6	% change
Yelloweye OFL	579 t	256 t	-56%
Yelloweye maxABC	434 t	192 t	-56%

Year	CSEO	EYKT	NSEO	SSEO
1998	15	48	8	37
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