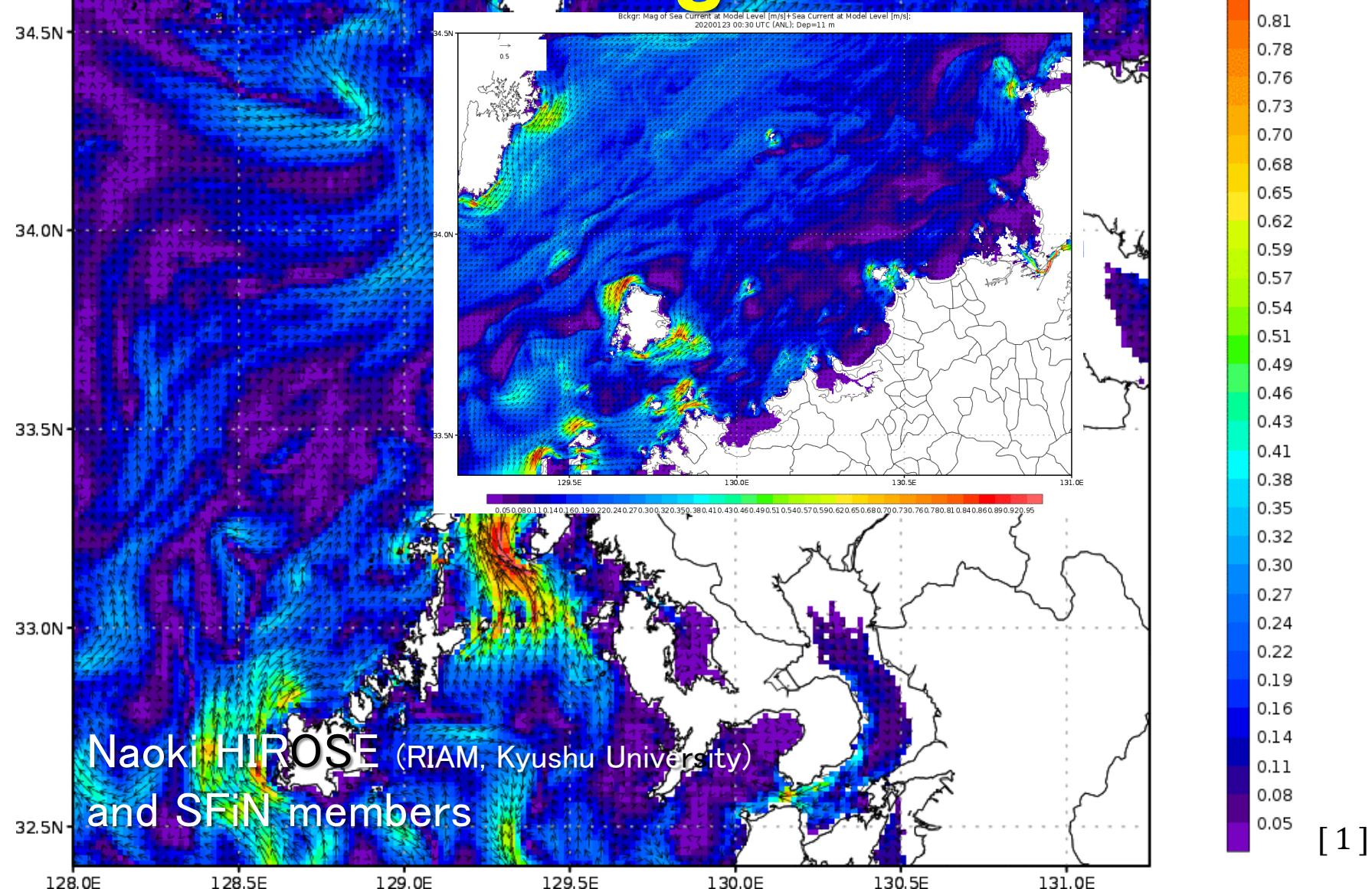


Coastal ocean prediction corrected

Bckgr: Mag of Sea Current at Model Level [m/s]+Sea Current at Model Level [m/s];
20200123 00:30 UTC (FRC 1H); Dep=11 m

by in-situ measurement data
from fishing vessels



Regional Ocean Prediction

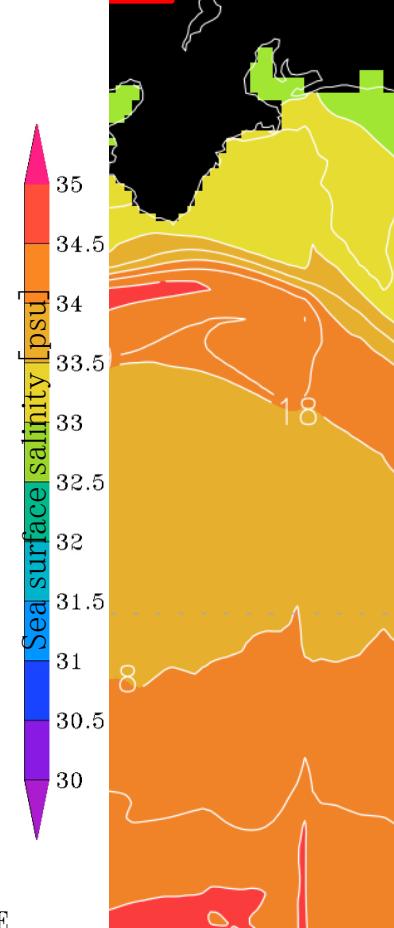
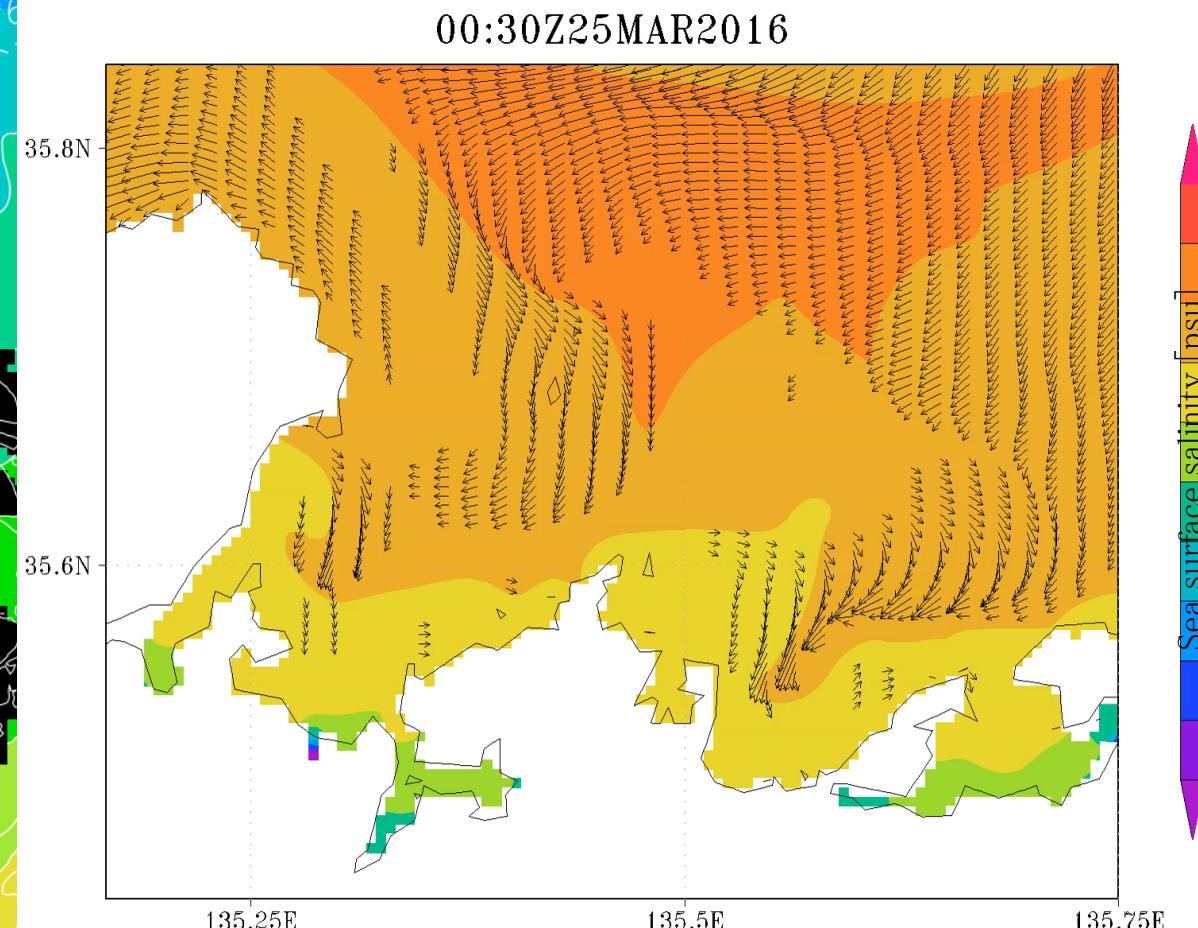
JADE/DREAMS

- ✓ JSNFR(FRA)+RIAM(KU)
- ✓ Since 2008 (JADE1→JADE2)
- ✓ For fisheries oceanography (squid, amberjack, queen crab, ...)
- ✓ Also for material transport (red tide, giant jellyfish, marine litter, ...)

SST prediction
2016-03-25

DREAMS_Wakasa

- ✓ MAFF project (2012-2014)
collaborated with prefectoral FESs
- ✓ Prediction of rapid current (Kyucho)
helps evacuation of fixed net (\sim km)



Our Strategy

Revival of small fisheries



Improving budget



ICT “smart” fishery



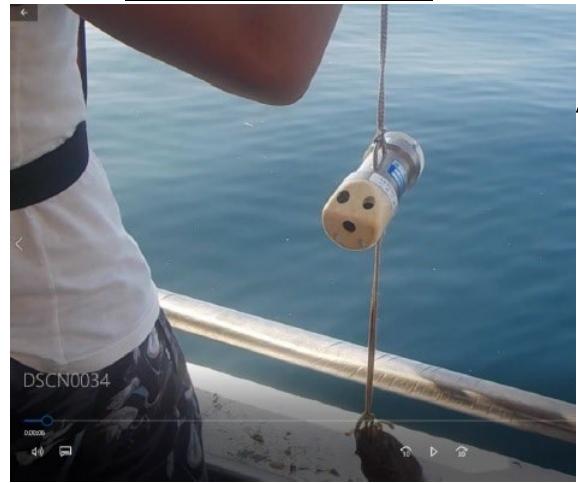
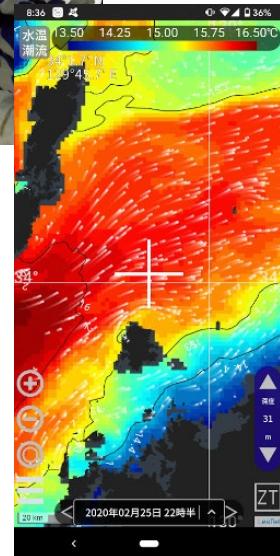
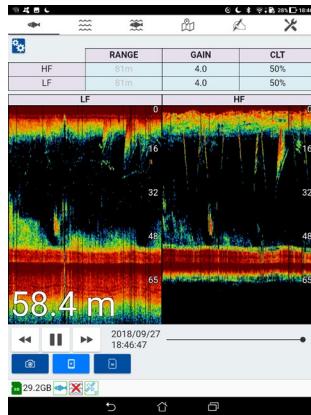
Fishing prediction

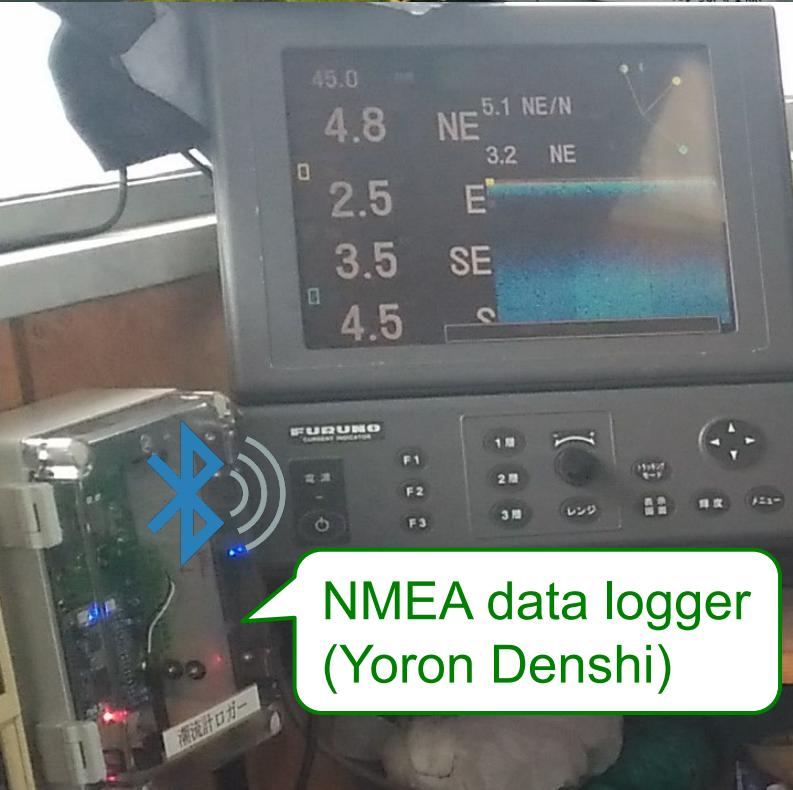


Accurate ocean forecast



Dense measurement







スマートCTD

HOME > 製品一覧 > 海洋・河川事業部 > スマートCTD



今まで培ってきたCTD技術により汎用精度の安価型CTDを開発しました。

500mlペットボトルサイズまで小型化し、煩わしい観測設定は不要としました。

観測データはBluetooth®無線技術でペアリングされたスマートフォンやタブレットにワンタッチで転送され、鉛直グラフや時系列グラフをその場で見ることができます。

特長：

- ①マグネットで簡単に電源ON-OFF操作が可能
- ②Bluetooth®無線技術で観測データをスマートフォンやタブレットに転送※1
- ③非接触充電採用
- ④独自のセンサーへッド形状により、降下方向に制約なし
- ⑤漁業の合間でも観測できる簡単操作
- ⑥漁具に取付可能な堅固な構造

※1 OSはAndroid™6.0以上が必要です。



海洋・河川事業部

▶ お問い合わせフォーム

▶ 事業部ニュース

▶ スマートCTD

▶ 10筒採水器／4筒採水器

▶ 水中カメラ

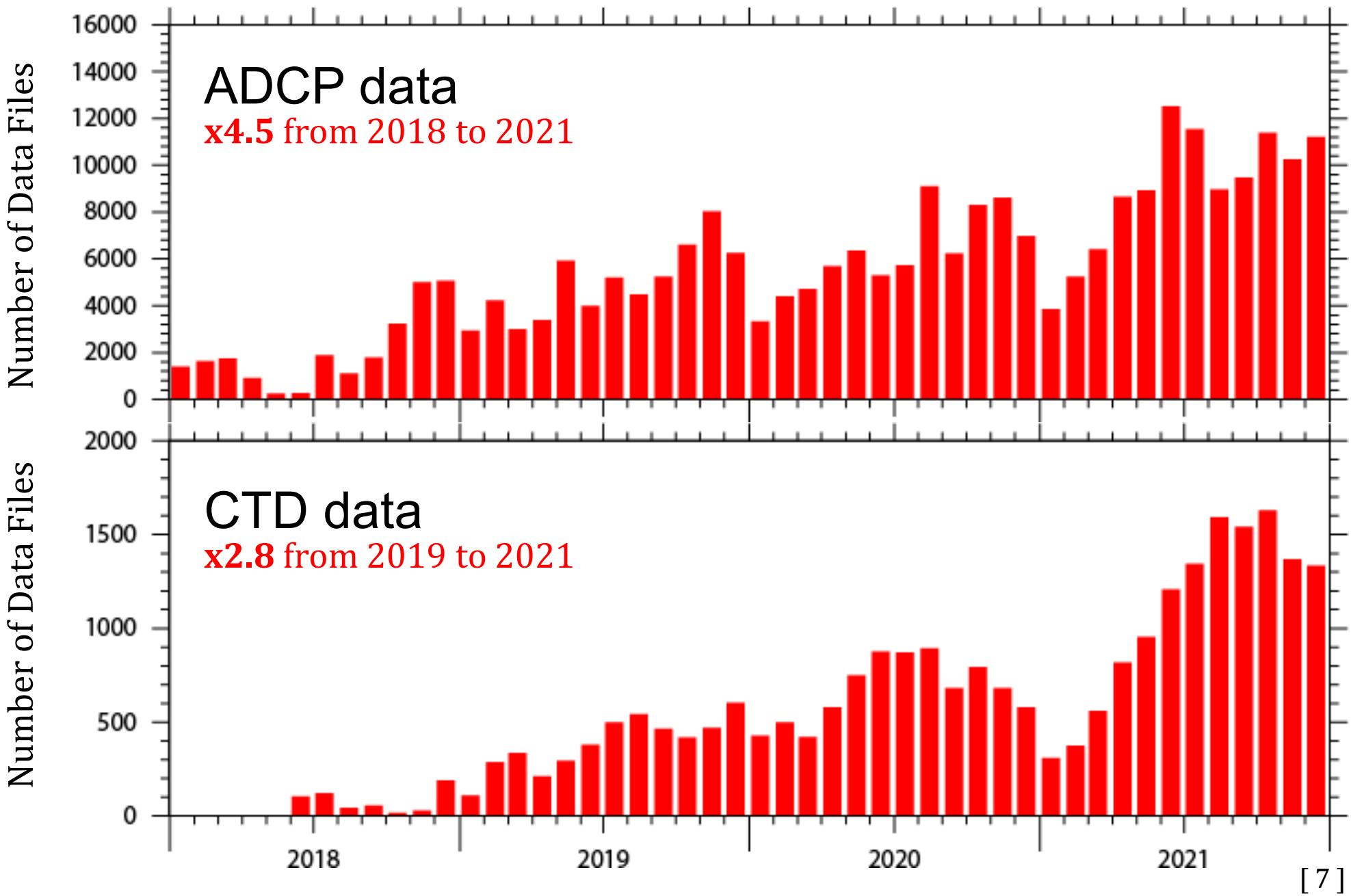
▶ DEFIシリーズ

▶ RINKOシリーズ

▶ INFINITYシリーズ

▶ 多波長励起蛍光光度計

Increasing Number of Data



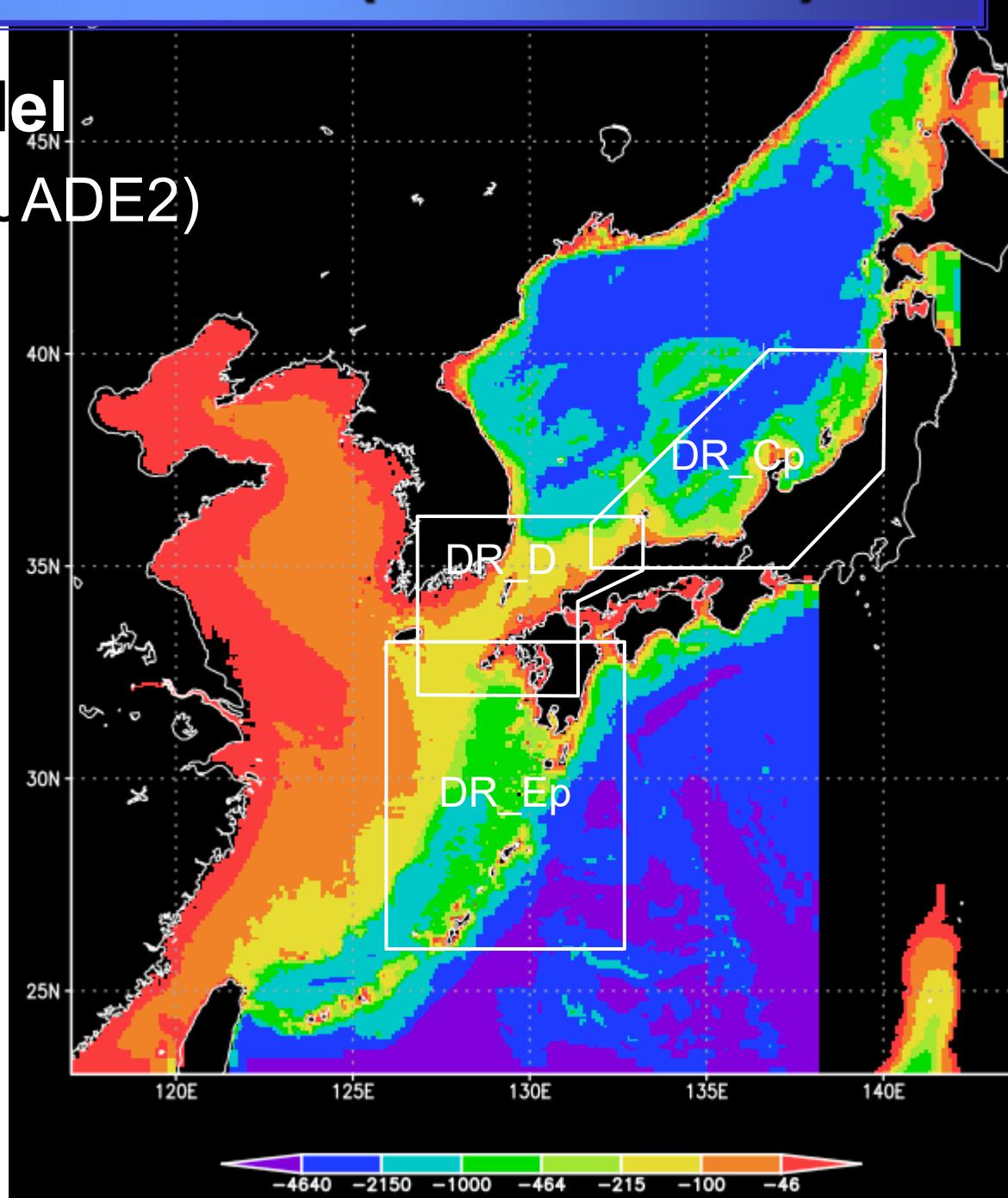
DR coastal models ($\Delta x \sim 1.5\text{km}$)

□ RIAM Ocean Model

- ✓ Nested in DR_M (JADE2)

□ RoKF DA

- ✓ F/V CTD, ADCP
- ✓ Satellite altimeter



Inverse estimation of tidal motion

□ Observation data: F/V ADCP data

- ✓ N=6348 from 7 vessels in Mar 2019

□ Correction parameters: 4 major tide as OBC

(Matsumoto et al., 2000, Moon et al., 2012)

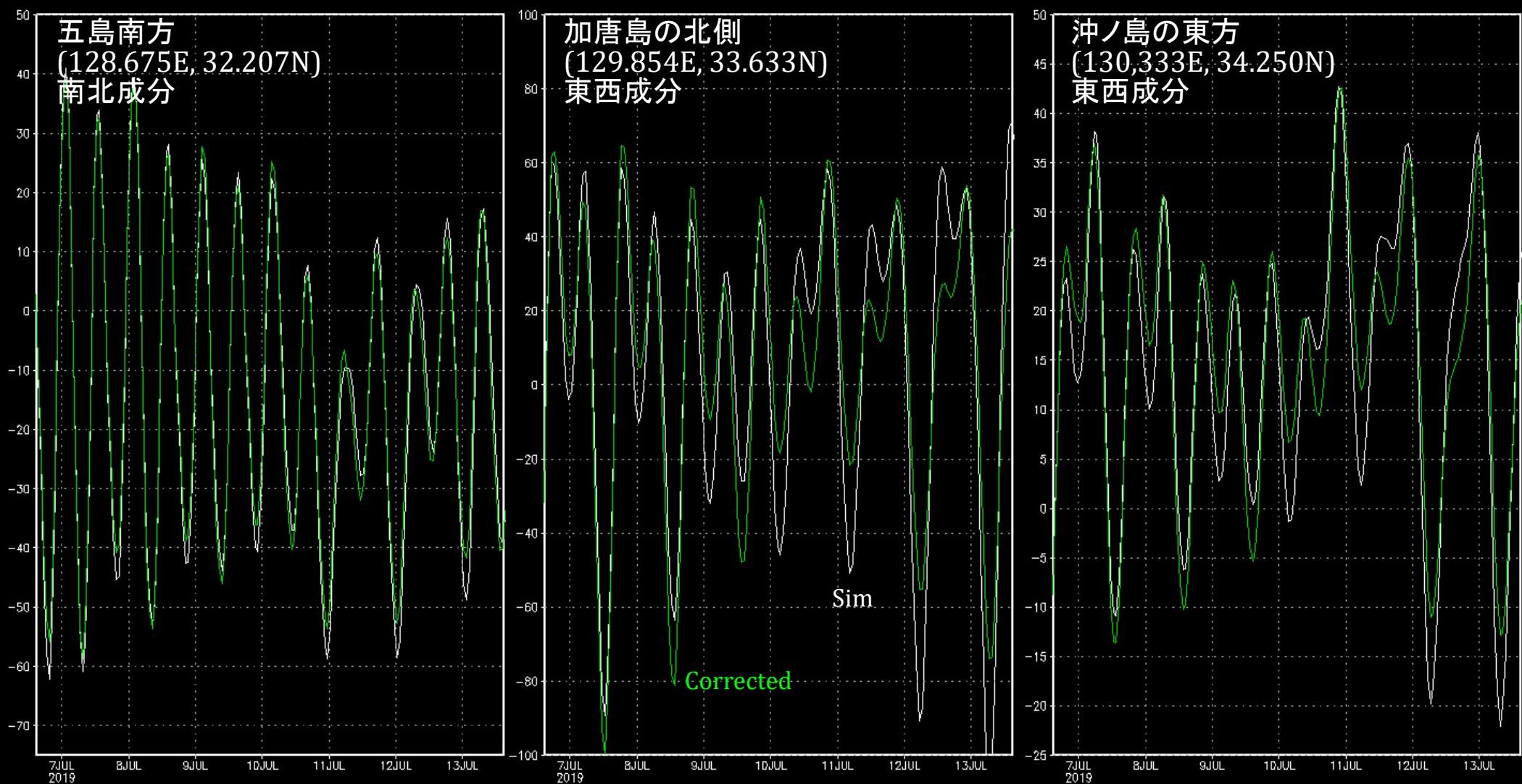
- ✓ M2: Amp×0.099, Phs–10.69°
- ✓ S2: Amp×0.093, Phs+71.38°
- ✓ K1: Amp×0.297, Phs+90.00°
- ✓ O1: Amp×0.466, Phs–130.17°

□ Statistics (Mar 2019)

- ✓ r (R^2): 0.922 (0.841) → 0.944 (0.891)
- ✓ rmsd: 8.6cm/s → 7.1cm/s

Time Series of Velocity

Along-shore component at 10m depth

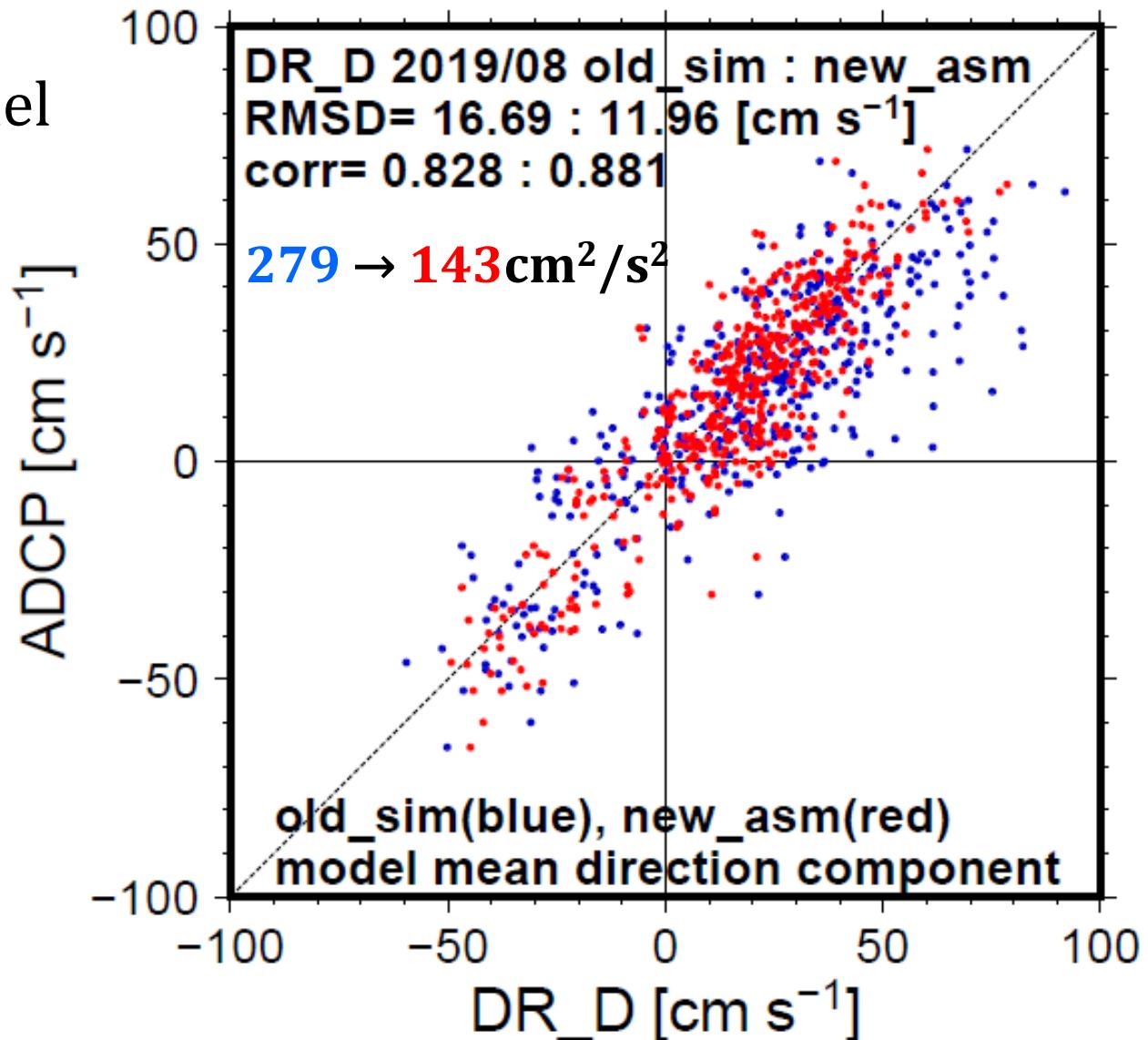


Ocean Model + Data Assimilation

1.5km RIAM Ocean Model
+ S-CTD and ADCP data
by sparse KF

Temperature
Corr: 0.899 → 0.931
Rmsd: 1.137 → 0.944
Residual Var.: -31%

Salinity
corr: 0.770 → 0.858
rmsd: 0.363 → 0.285
Residual Var.: -38%



< Previous Article Next Article >



Journal of Atmospheric and Oceanic Technology

☰ Volume 38: Issue 6

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Editorial Type: Article

o Vertical Viscosity Coefficient Increased for High-Resolution Modeling of the Tsushima/Korea Strait

Naoki Hirose¹, Tianran Liu¹, Katsumi Takayama¹, Kats... [View More +](#)

Published-online: 24 Jun 2021

Print Publication: 01 Jun 2021

DOI: <https://doi.org/10.1175/JTECH-D-20-0156.1>

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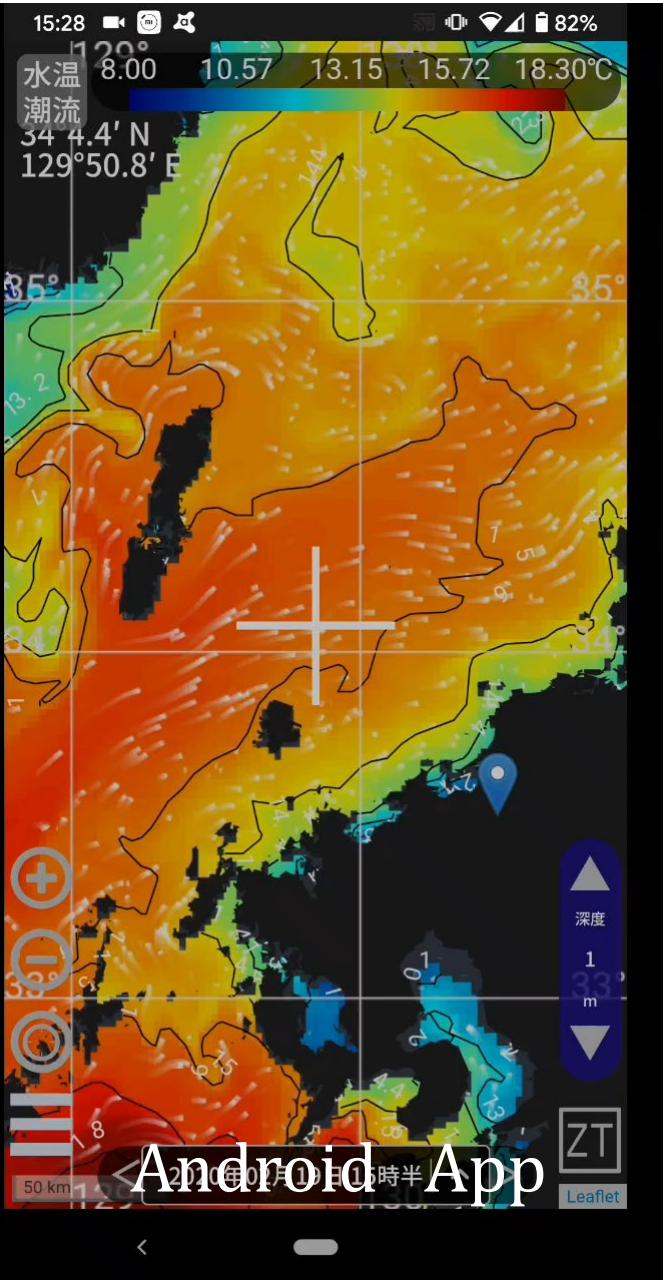
Abstract

This study clarifies the necessity of an extraordinary large coefficient of vertical viscosity for dynamical ocean modeling in a shallow and narrow strait with complex bathymetry. Sensitivity experiments and objective analyses imply that background momentum viscosity is on the order of $100 \text{ cm}^2 \text{ s}^{-1}$, while tracer diffusivity estimates are on the order of $0.1 \text{ cm}^2 \text{ s}^{-1}$. The physical interpretation of these estimates is also discussed in the last part of this paper. To obtain reliable solutions, this study introduces cyclic application of the dynamical response to each parameter to minimize the number of long-term sensitivity experiments. The recycling Green's function method yields weaker bottom friction and enhanced latent heat flux simultaneously with the increased viscosity in high-resolution modeling of the Tsushima/Korea Strait.





Comments from local fishermen



“Through the CTD castings, I found the range of bottom temperature for good catches.”

“Prediction of high-frequency changes of ocean current is quite accurate on this app. I can choose the moderate condition for the best behavior of my fishing gear.”

“Visualization of ocean environment helps to teach fishing conditions for beginners.”

“I do not have to look around the fishing grounds anymore and thus 15% cut of fuel oils. It makes me so relaxed that I can take a nap on site.”

13 fishermen reached “smart effect 15%”!

- ✓ Longline fishing, Beach seine, single-pole fishing, trawling, Octopus trap, ...

Smart effect: original measure of reduction of fuel oil, work hours, etc.

SFiN: Smart Fisheries Network

□ Succeeding the 5Y JFA project

- ✓ Estimated profit: Several hundreds of millions of yen/year in northern Kyushu
 - ~(500-1000 fishermen using our ocean prediction)
 - × (spend 6-8MYen) × (2-5% reduction)

□ Originally 8 QSF members (2017)

→ Currently 22 SFiN members (2022)

産	官	学	
いであ JFEアドバンテック 漁業情報サービスセンター	佐賀県 福岡県 長崎県	島根県 鳥取県 石川県	九州大学(事務局) 長崎大学 鹿児島大学
古野電気	熊本県	富山県	福井県立大学
環境シミュレーション研究所 オーシャンアイズ	鹿児島県 山口県	秋田県 千葉県	