Observation impact on the medium and the long-term range forecast on an eddy-resolving ocean forecast system based on ROMS

*瀬藤 聡[1]、黒田 寛[5]、高橋 大介[5]、東屋 知範[5]、奥西 武[2]、長谷川 大介[2]、筧 茂穂[2]、金子 仁[2]、清水 勇吾[1]、日高 清隆[1]、廣江 豊[1]、山崎 恵市[1]、亀田 卓彦[1]、青木 一宏[1]、種子田 雄[3]、森永 健司[4]、岡崎 誠[4]、増島 雅親[4]、西本 篤史[1]

*Takashi Setou[1], Hiroshi Kuroda[5], Daisuke Takahashi[5], Tomonori Azumaya[5], Takeshi Okunishi[2], Daisuke Hasegawa[2], Shigeho Kakehi[2], Hitoshi Kaneko[2], Yugo Shimizu[1], Kiyotaka Hidaka[1], Yutaka HIroe[1], Keiichi Yamazaki[1], Takahiko Kameda[1], kazuhiro aoki[1], Takeshi Taneda[3], Kenji Morinaga[4], Makoto Okazaki[4], Masachika Masujima[4], Atsushi Nishimoto[1]

1. 国立研究開発法人水産研究・教育機構中央水産研究所、2. 国立研究開発法人水産研究・教育機構東北区水産研究所、3. 国立研究開発法人水産研究・教育西海区水産研究所、4. 国立研究開発法人水産研究・教育機構国際水産資源研究所、5. 国立研究開発法人水産研究・教育機構北海道区水産研究所

1. National Research Institute of Fisheries Science, Japan Fisheries Research and Education Agency, 2. Tohoku National Fisheries Research Institute, Japan Fisheries Research and Education Agency, 3. Seikai National Fisheries Research Institute, Japan Fisheries Research and Education Agency, 4. National Research Institute of Far Seas Fisheries, Japan Fisheries Research and Education Agency, 5. Hokkaido National Fisheries Research Institute, Japan Fisheries Research and Education Agency

Japan domestic fisheries research institutions constitute a horizontally close-arranged monitoring system around the coastal and the offshore region of Japan in the western North Pacific. Most of these hydrographic data (hereafter FRDATA) have been introduced for an eddy-resolving ocean forecast system, named by the FRA-ROMS (Kuroda et al. 2016, Ishii et al., 2016, Kodama et al. 2015), which developed by Japan Fisheries Research and Education Agency and is based on ROMS (Regional Ocean Modeling System) assimilated with satellite SSH/SST and hydrographic data such as GTSPP and FRDATA. The assimilation scheme, which is founded on the MOVE system developed by the Japan Meteorological Research Institute, is characterized by the following three steps; (1) minimizing the nonlinear cost functions by using a pre-conditioning method, (2) analyzing temperature-salinity profiles by using vertical coupled EOF modes, and (3) assimilating the data analyzed into an ocean model, namely, making reliable reanalysis data by using the Incremental Analysis Updates method. We assessed the relative impact of FRDATA by comparing modeled fields with assimilated and withheld FRDATA. The coastal FRDATA enabled to finely represent hydrographic structures in the coastal region and to remarkably improve the coastal forecast on the medium range forecast (about 1-month). On the other hand, the offshore FRDATA contributed to improve the accuracy not only on the long-term forecast (about 2-months) of some synoptic phenomena (e.g. the Kuroshio) but also of some coastal changes caused by such the phenomena.