

# Skillful multiyear prediction of the Kuroshio and Gulf Stream jets and eddies with an initialized eddy-resolving ocean general circulation model



Shoichiro Kido\*, Masami Nonaka, and Yasumasa Miyazawa  
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)



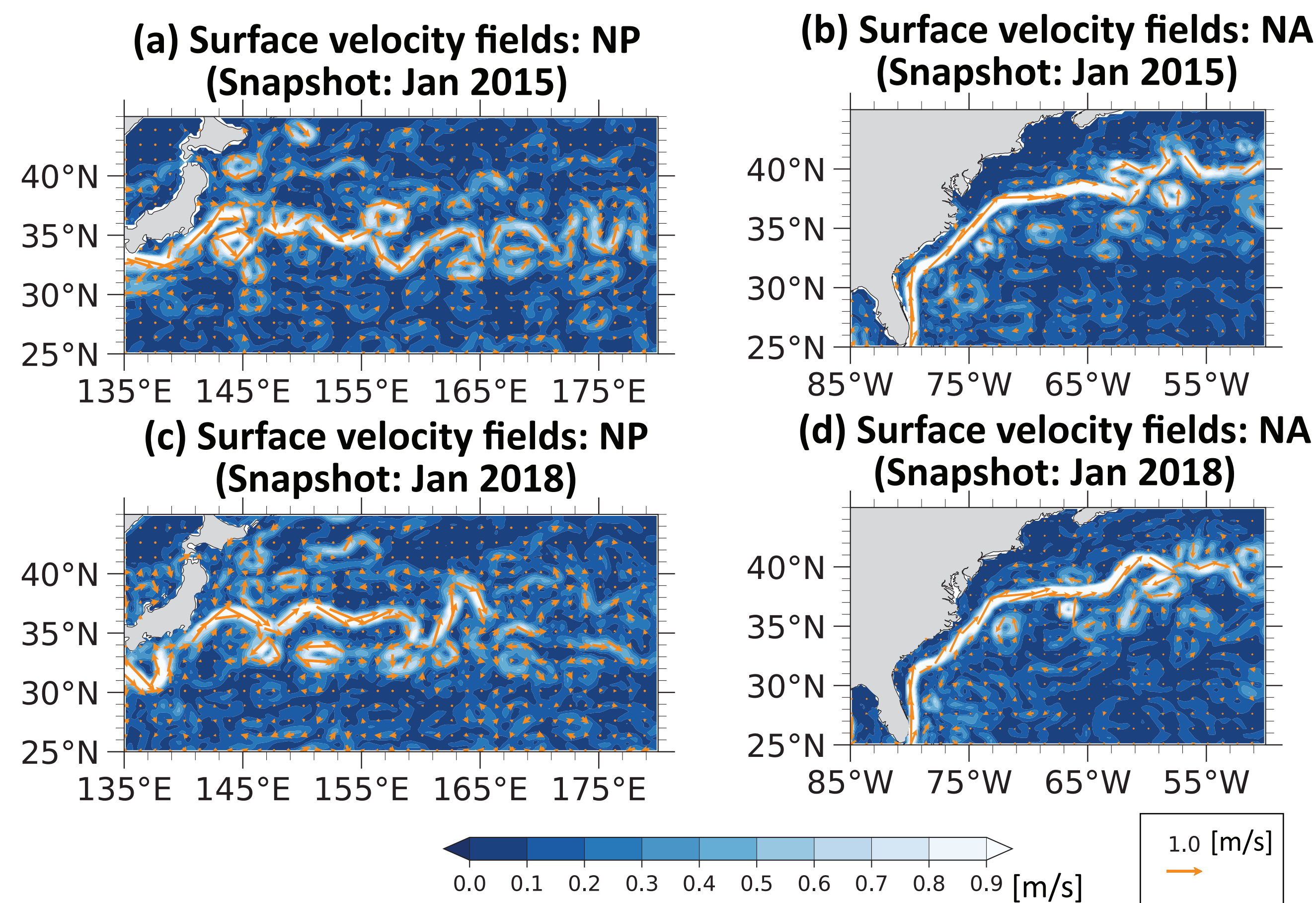
## Quick summary of this work:

A newly developed eddy-resolving dynamical ocean nowcasting/forecasting system is skillful at predicting multiyear variations in intensity of jets and eddies in the Kuroshio and Gulf Stream regions

## 1. Introduction

### Background

- The Kuroshio and Gulf Stream are characterized by strong inertial jets and vigorous meso-scale eddies, and serve as a key component of the wind-driven circulation in the extratropical oceans
- Intensities of jets and eddy fields in both regions exhibit distinct interannual-to-decadal variation



### The goal of this work

- Assess operational predictability of spatiotemporal variations in the Kuroshio Extension (KE) and Gulf Stream (GS) jets and eddy fields

## 2. Experimental design

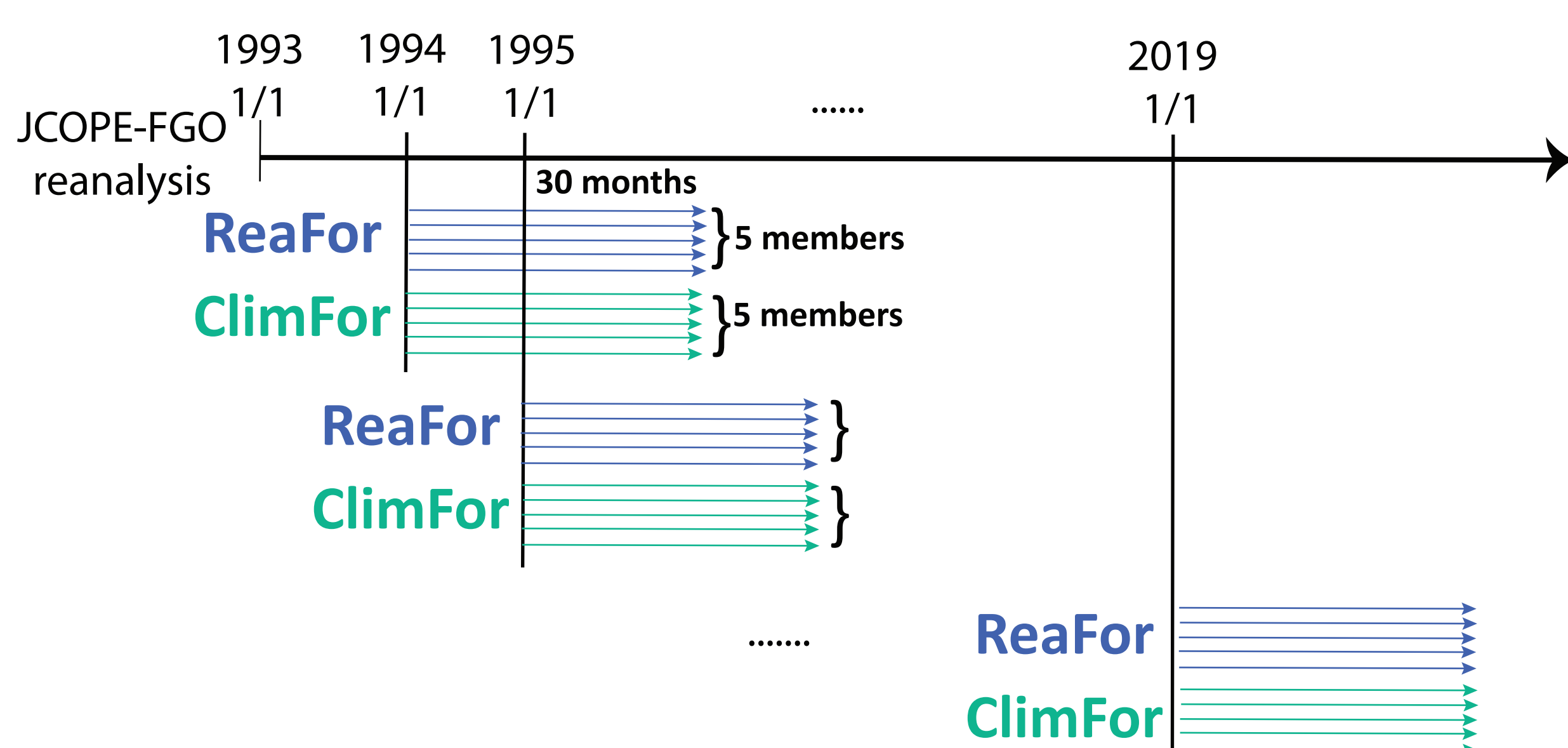
### JCOPE-FGO (Kido et al., 2021)

→ A semi-global ocean dynamical nowcasting/forecasting system covering the global ocean with a horizontal resolution of  $0.1^\circ \times 0.1^\circ$

- The reanalysis fields of COPE-FGO are used as initial conditions for forecasting experiments

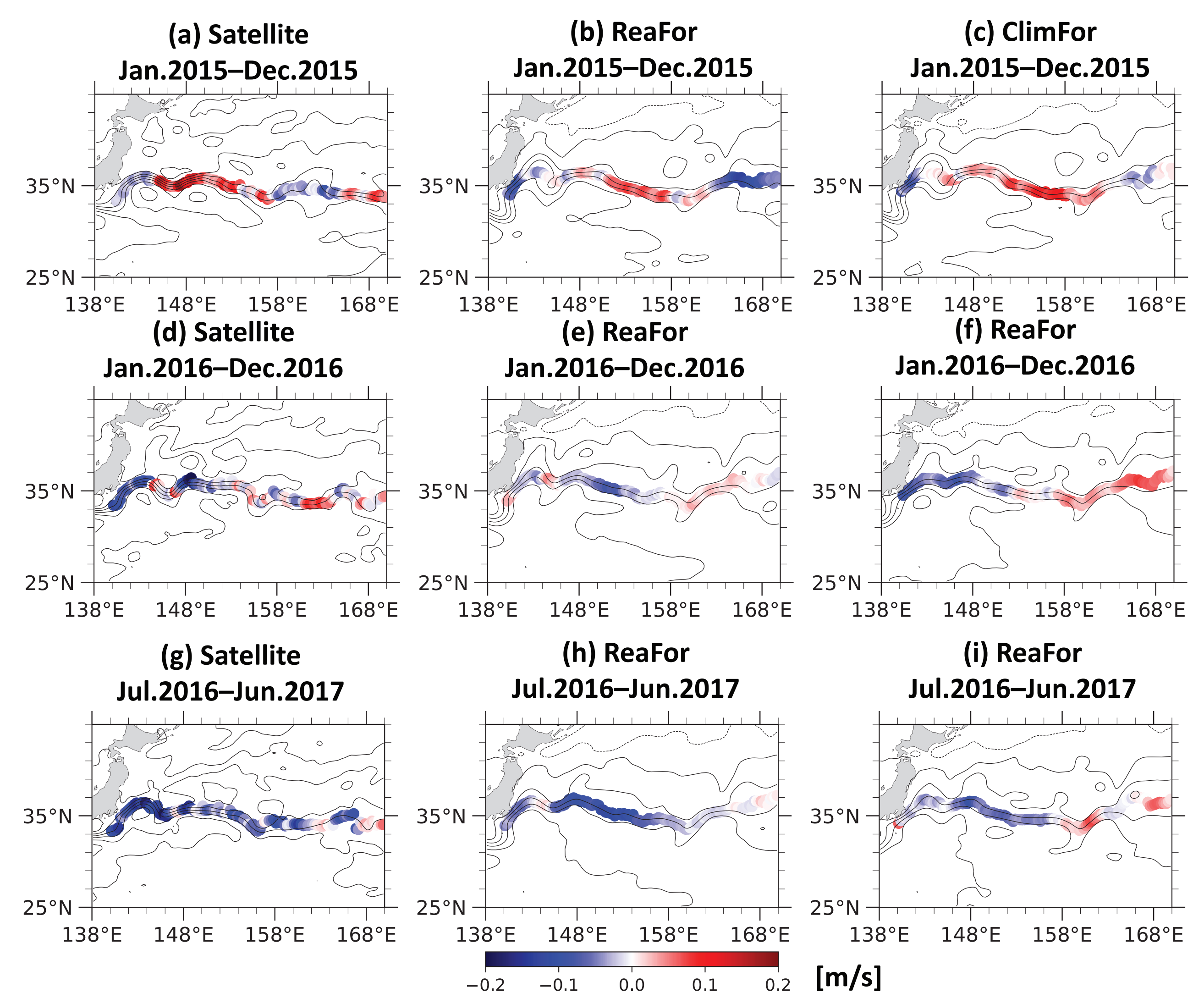
### Two sets of forecasting experiments

- Integrations with the same interannually varying atmospheric forcing as the reanalysis run: **ReaFor**
- Integrations with climatological forcing: **ClimFor**

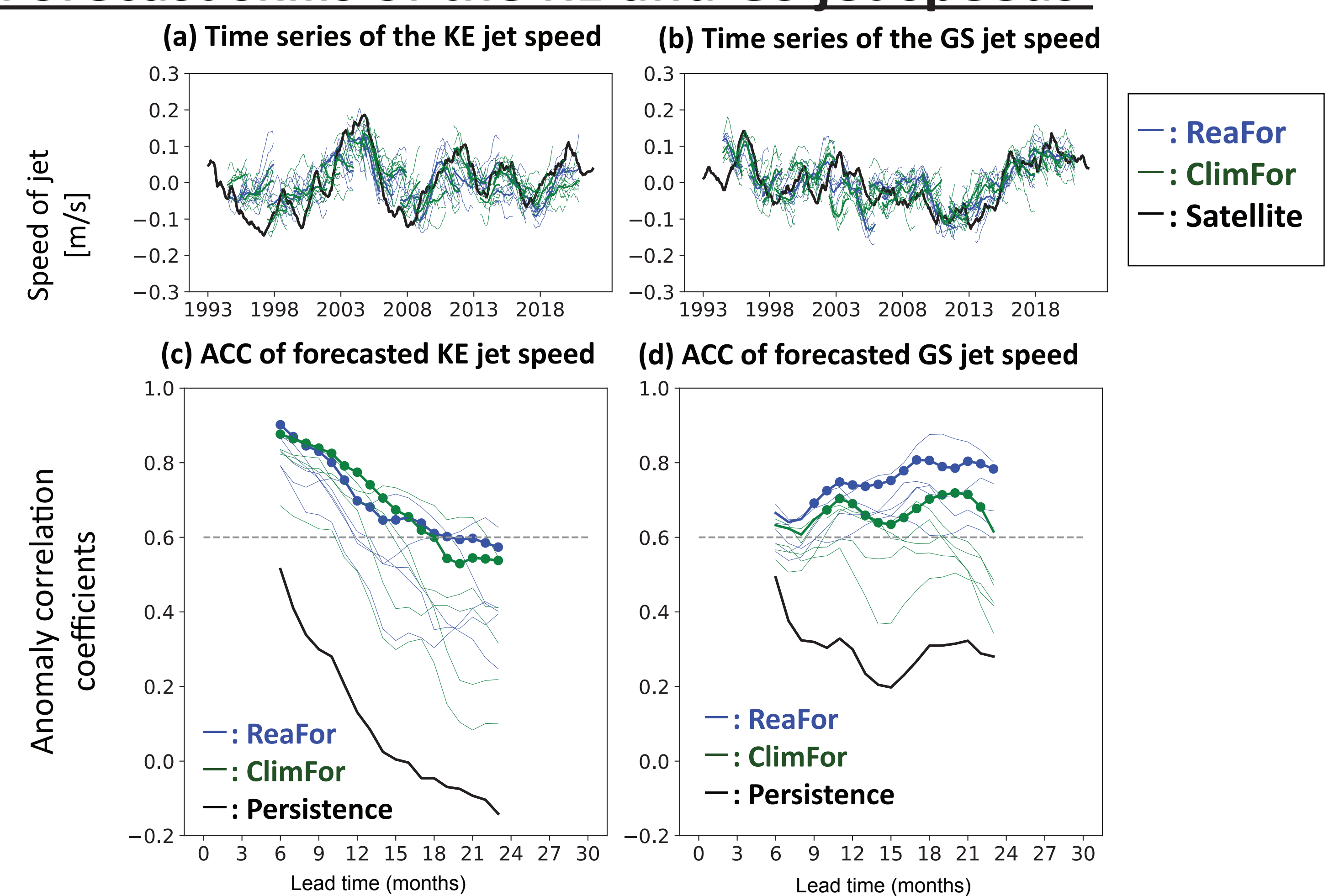


## 3. Results

### An example for skillful forecast of the KE jet speed



### Forecast skills of the KE and GS jet speeds



### Forecast skills of low-frequency modulations in the mesoscale eddy fields

