

海軍大氣海洋局 作業化海流模式

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108年天氣分析與預報研討會

簡報內容

- 前言
- 模式簡介
- 作業程序與模式設定
- 模式結果與討論
- 結論與未來展望

前言

- **海軍大氣海洋局**負責海軍所有有關大氣與海洋戰場環境資料蒐集、分析、運用、預報、兵要統計及研究發展等工作。為增強對大氣與海洋戰場環境的掌握，以「**高速數值預報模式運算系統建置**」計畫**重新建構其大氣與海洋數值模式之作業環境**，藉以提升數值模擬預報能量，包含縮短運算時間、提高解析度與增進預報時間等，期能更快速提供戰場指揮官細微且長期的預報產品，更有效率支援建軍備戰任務。

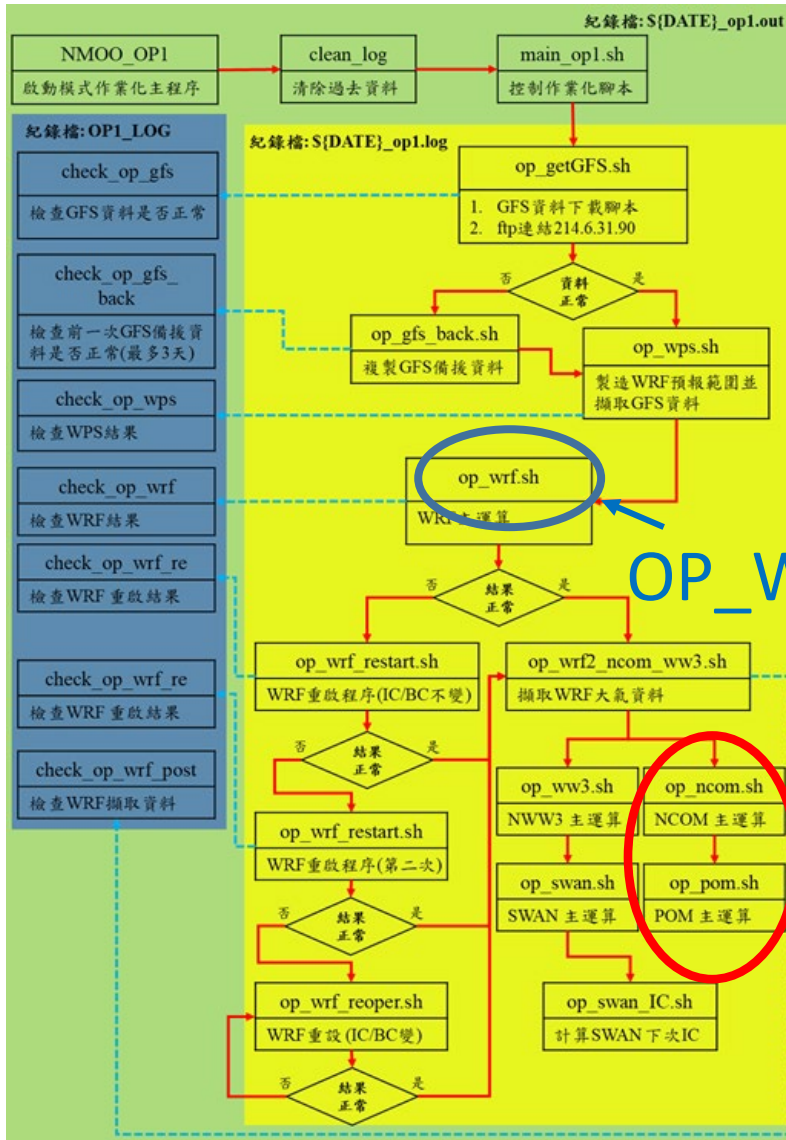
模式簡介：POM

- Princeton Ocean Model
- Sigma垂直座標
- Turbulent closure submodel
- Mode-splitting method

模式簡介：NCOM

- Naval Research Laboratory發展
- Sigma-Z垂直座標
- Naval Oceanographic Office作業化維護
 - 1/8 degree全球
 - 1/30-1/36 degree區域
- Navy Coupled Ocean Data Assimilation System
 - SSH
 - SST
 - In situ

作業程序與模式設定



每日2報：00Z, 12Z

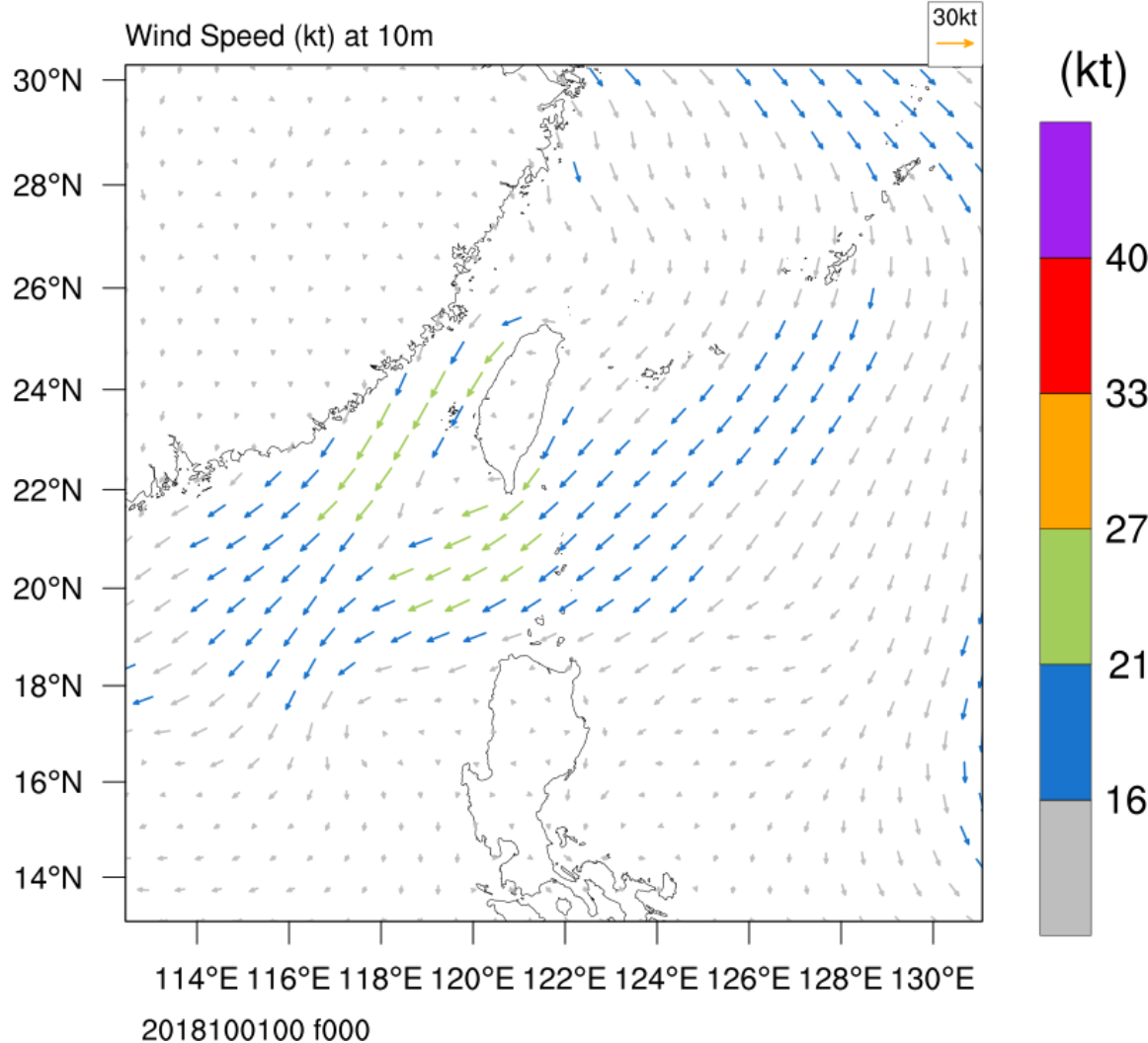
00Z為例：
13:00 Get data

16:30 Ocean model

作業化流程圖

WRF風場

2018-10-01_00:00:00



13.1-30.3°N

112.4-131.0°E

解析度 : 3 km

預報8天

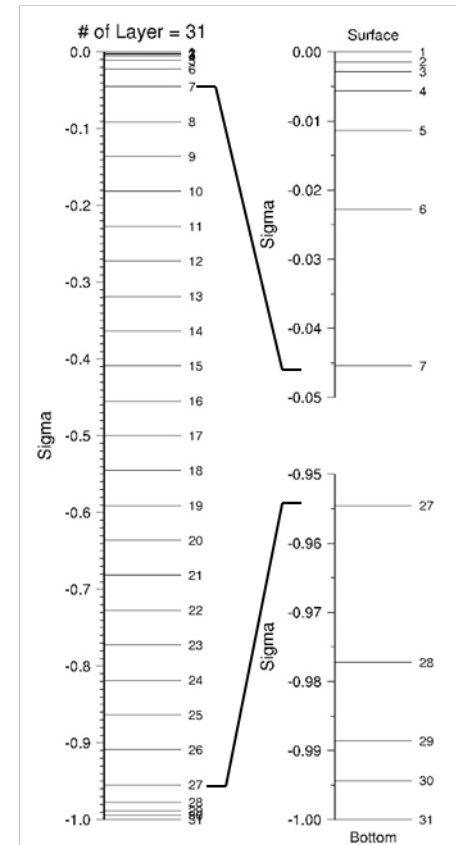
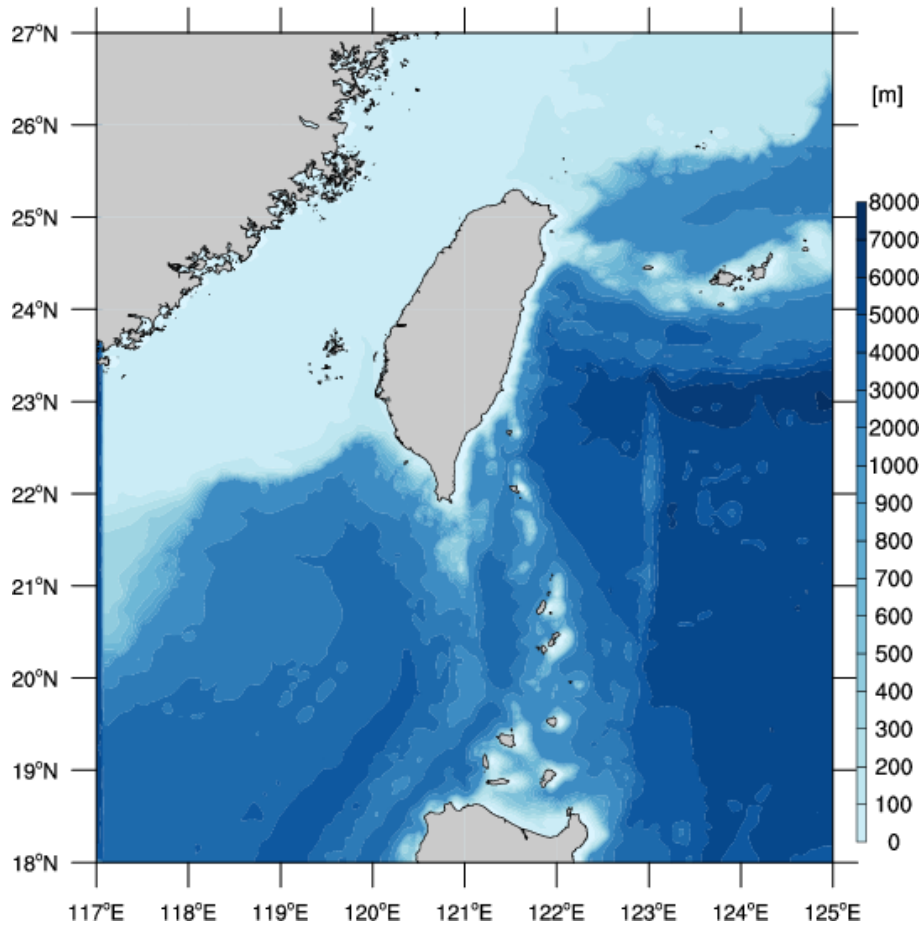
提供海洋模式 :

- 風應力
- 氣壓
- 熱通量

OP_POM模式範圍

18-27°N, 117-125°E

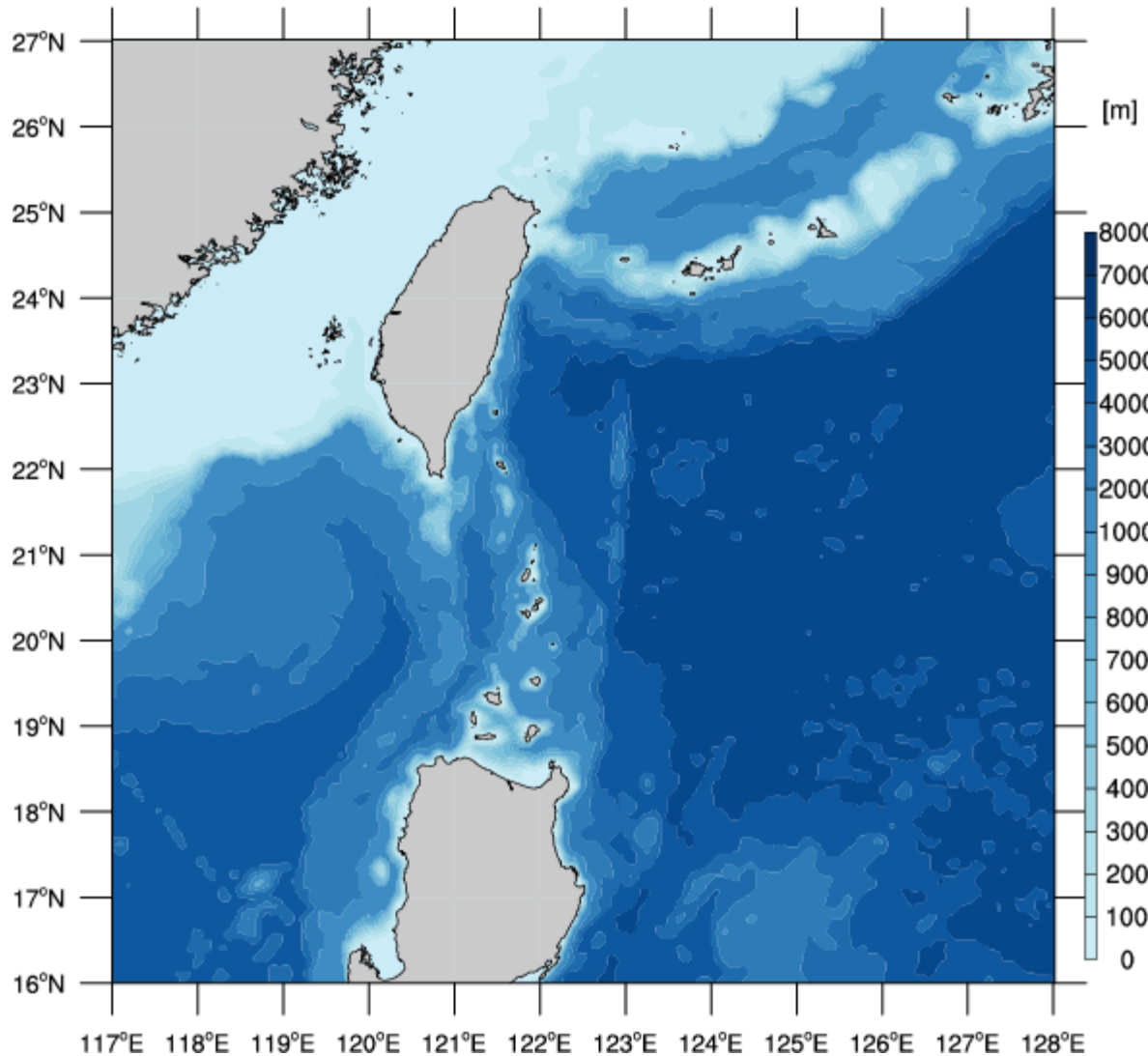
水平網格間距：1/24°(~4.5km)，
垂直分層：Sigma座標，31層。



OP_POM系統架構

- 2009建置
- East Asian Seas Ocean Nowcast / Forecast System (EASNFS)
 - 2003-2008年每5天氣候平均值
- Tide : 11分潮
 - (M2, S2, N2, K2, K1, O1, P1, Q1 MF, MM, M4)
- 4天前開始計算，預報未來7天
- DTE=3s, DTI=90s
- 1 CPU, 45分鐘
- 逐時輸出Z-level 33 層

OP_NCOM模式範圍



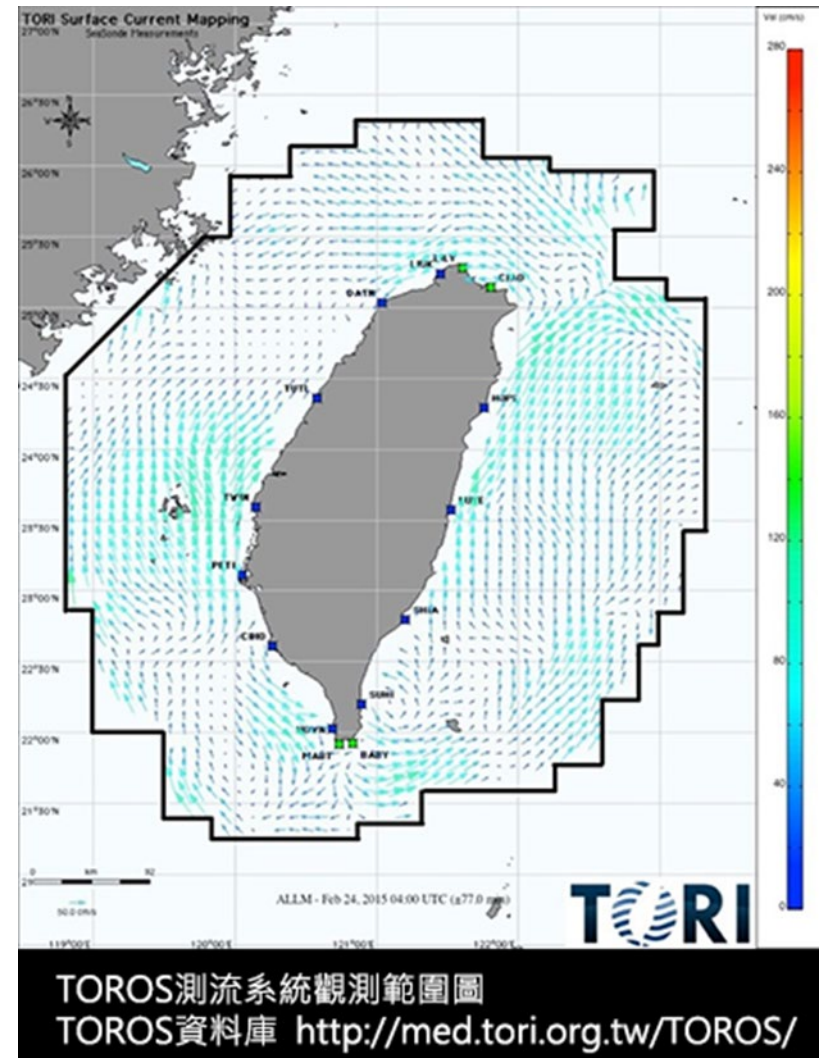
- 16-27°N, 117-128°E
- 解析度：0.027°
- Sigma-Z座標
 - < 550m, Sigma level : 35
 - > 550m, Z level : 15

OP_NCOM系統架構

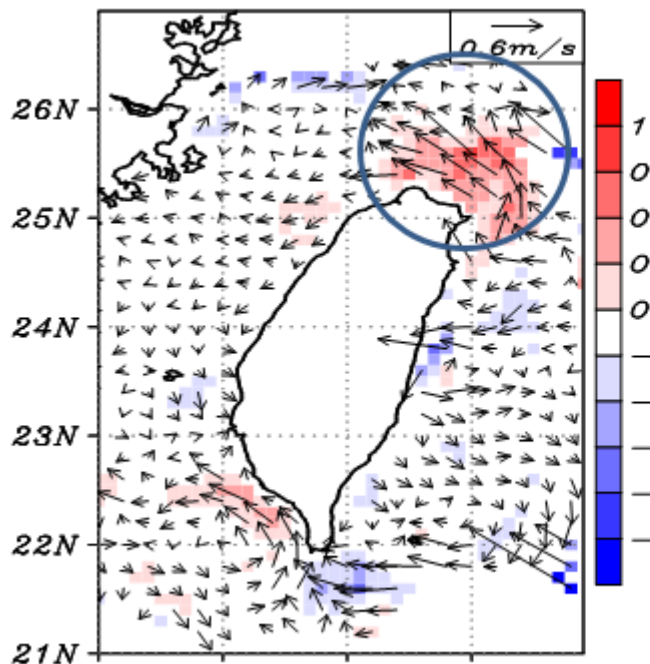
- 2017建置
- Real-Time Ocean Forecast System (RTOS)
 - 逐日更新，預報6天
- Tide : 8分潮
 - M2, S2, N2, K2, K1, O1, P1, Q1
- 4天前開始計算，預報未來7天
- Time step = 30s
- 256 CPU, 15分鐘
- 逐時輸出Z-level 40 層

模式結果與討論

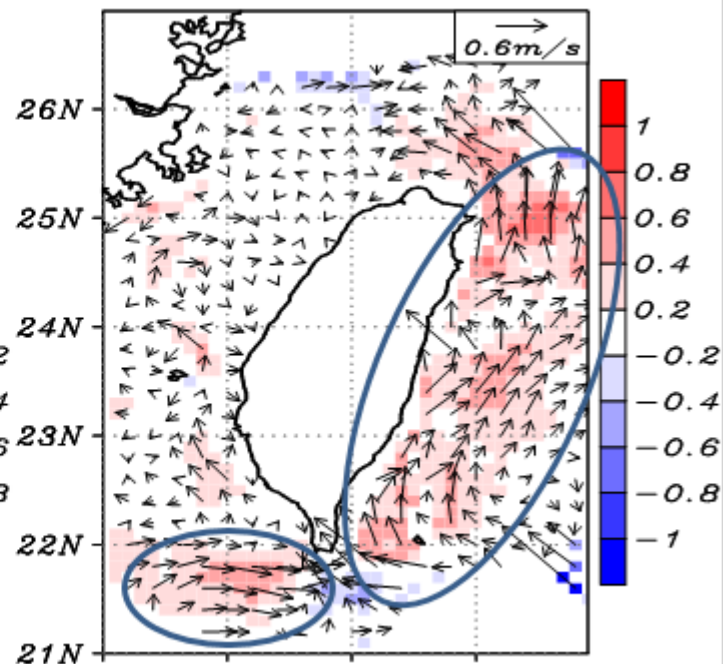
- 模擬結果與觀測資料比對
- 2018年1-10月各月平均值
 - TOROS：逐時
 - OP_POM：00Z, 12Z
 - OP_NCOM：00Z, 12Z



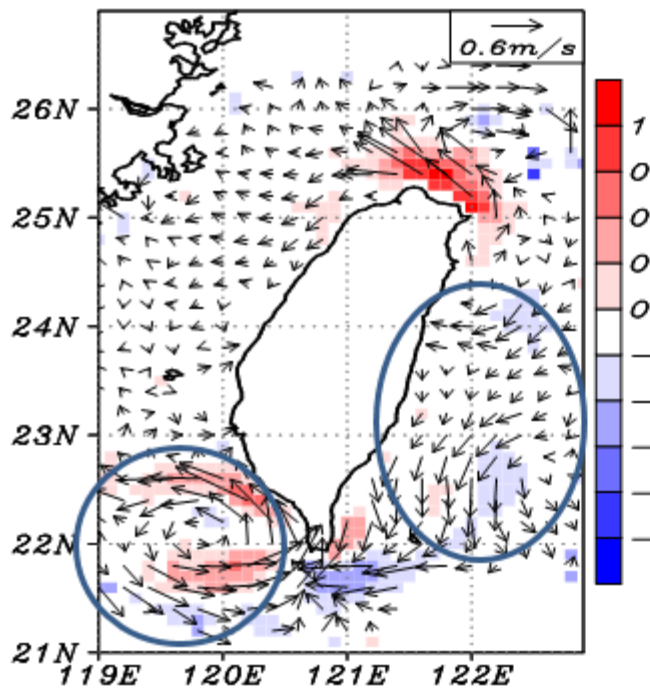
NCOM-TOROS 201801



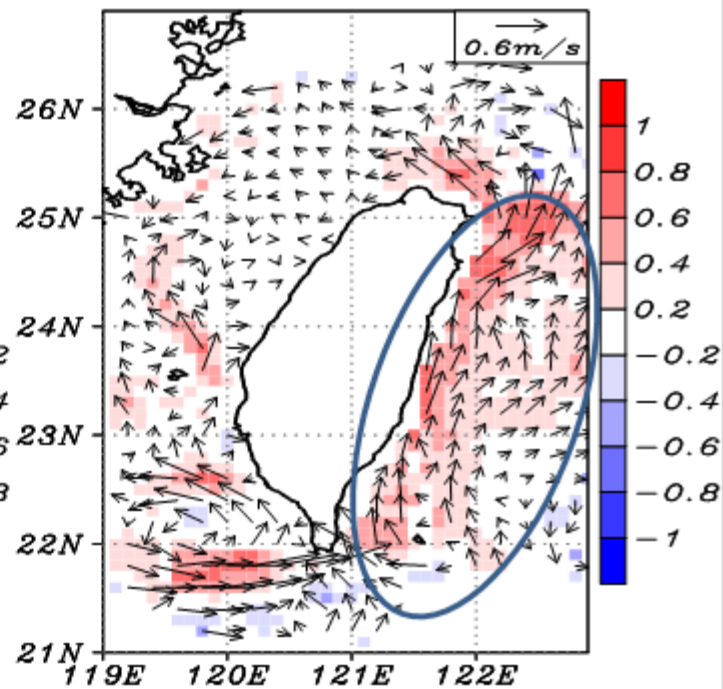
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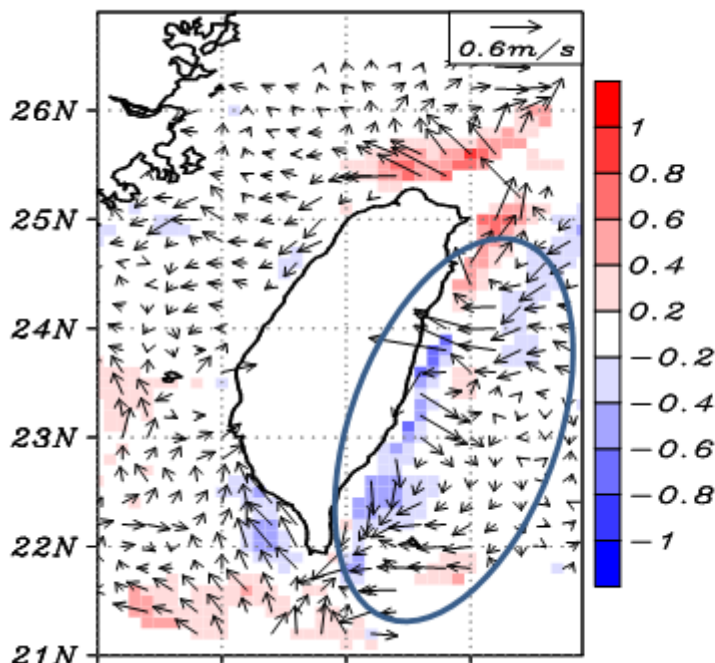
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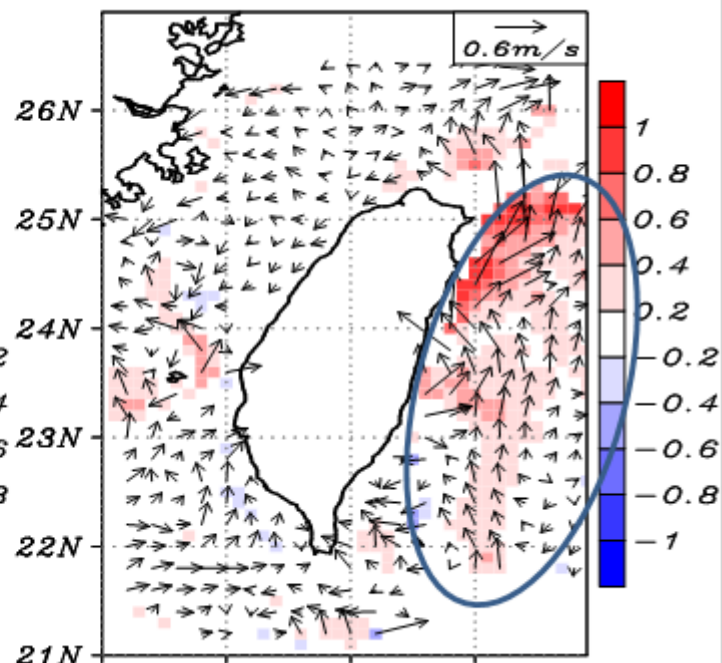
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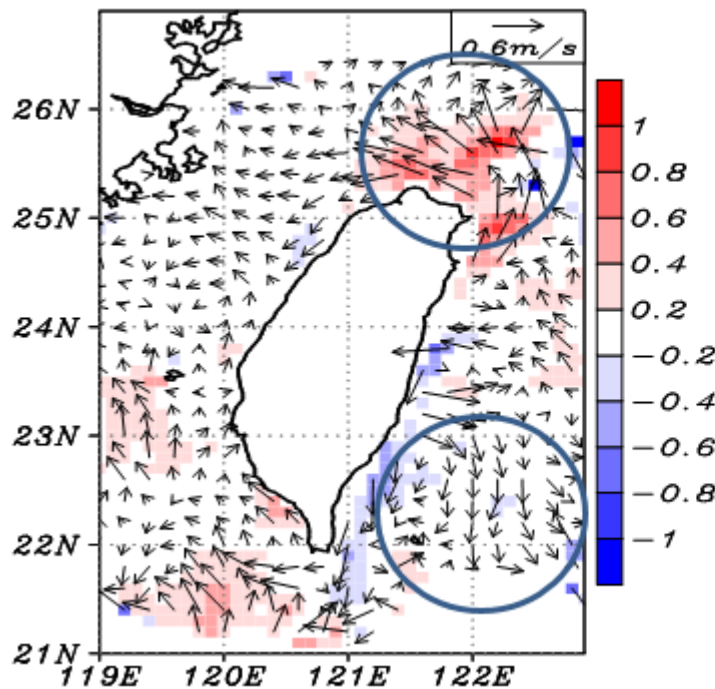
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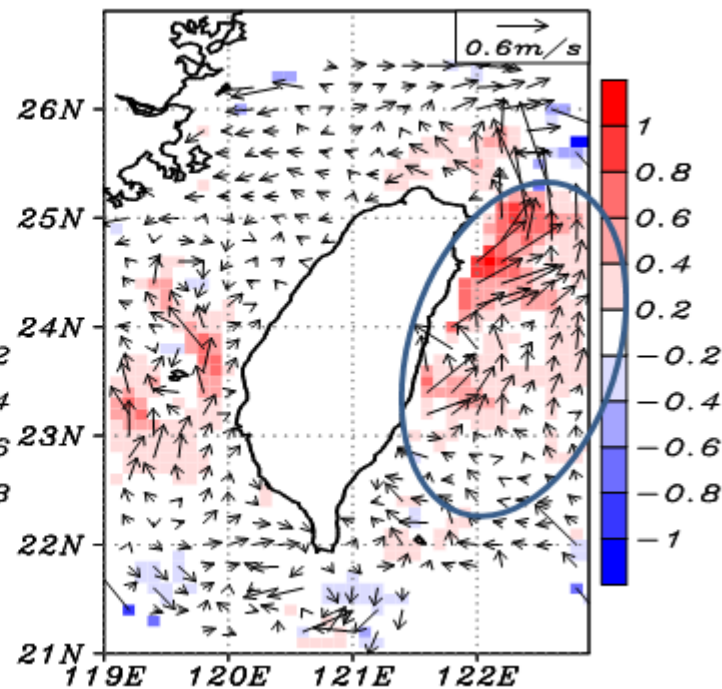
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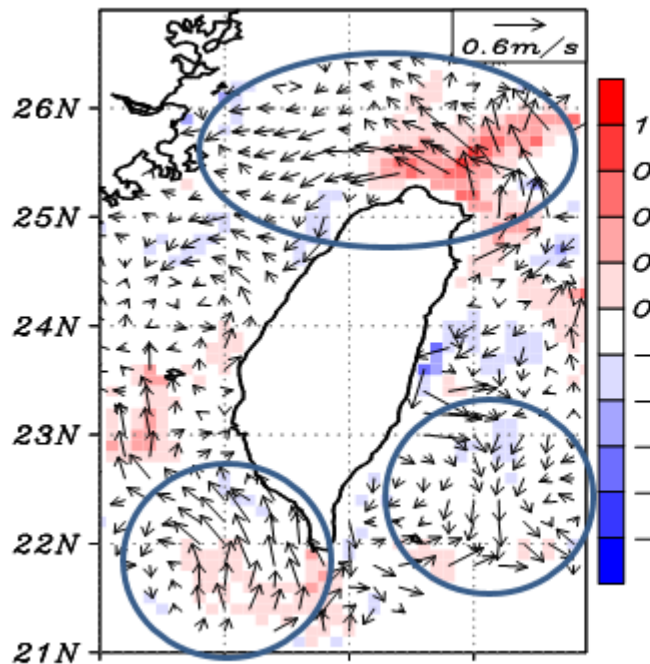
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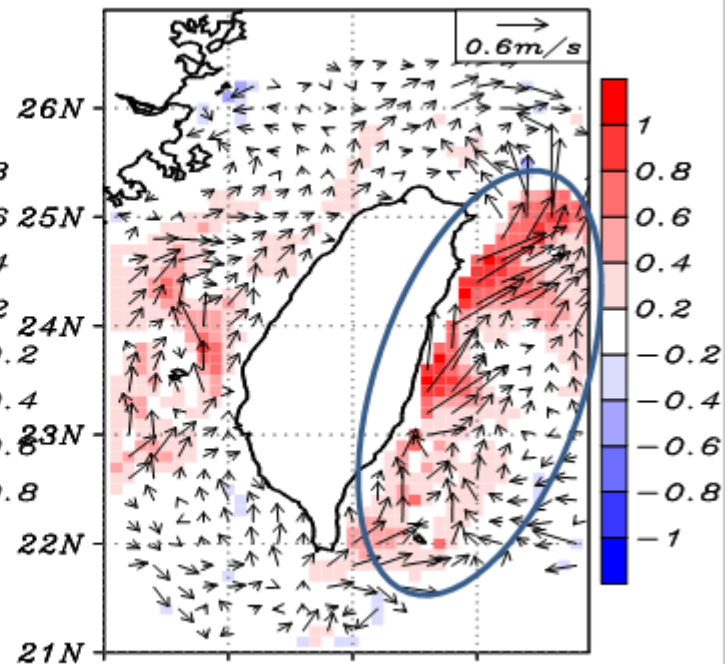
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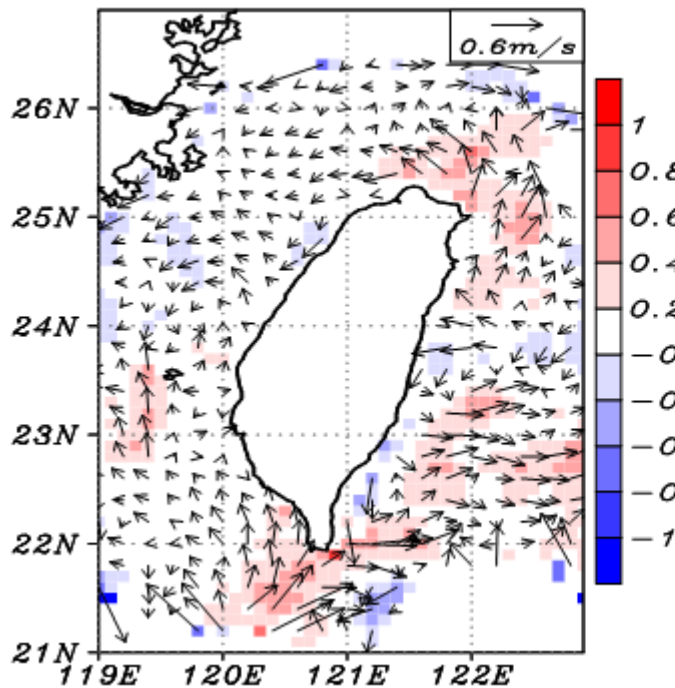
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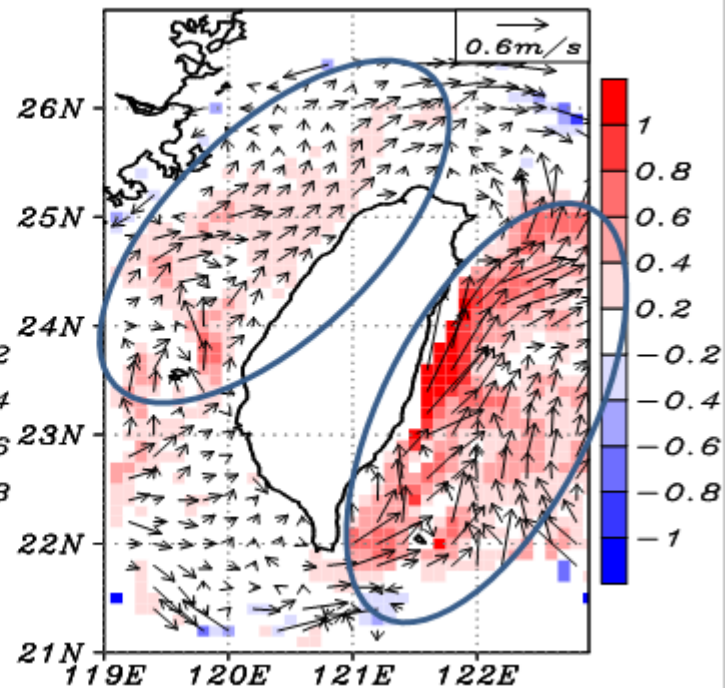
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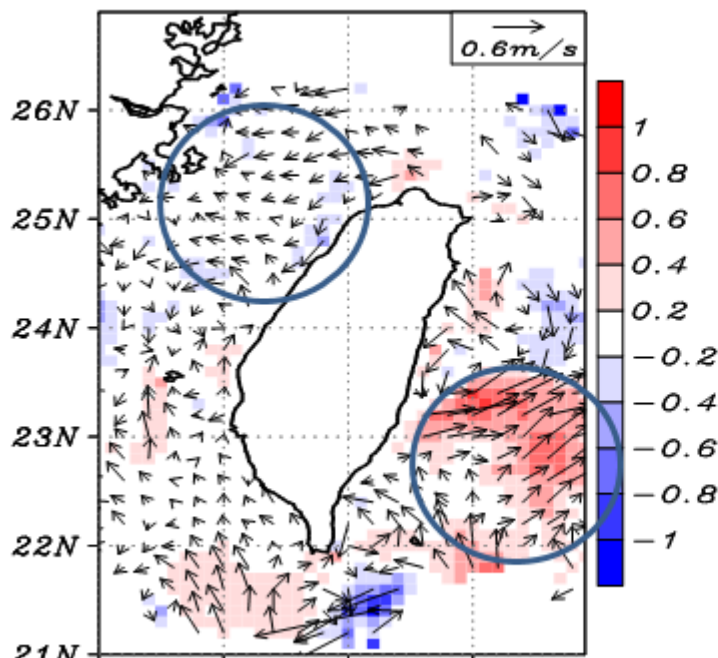
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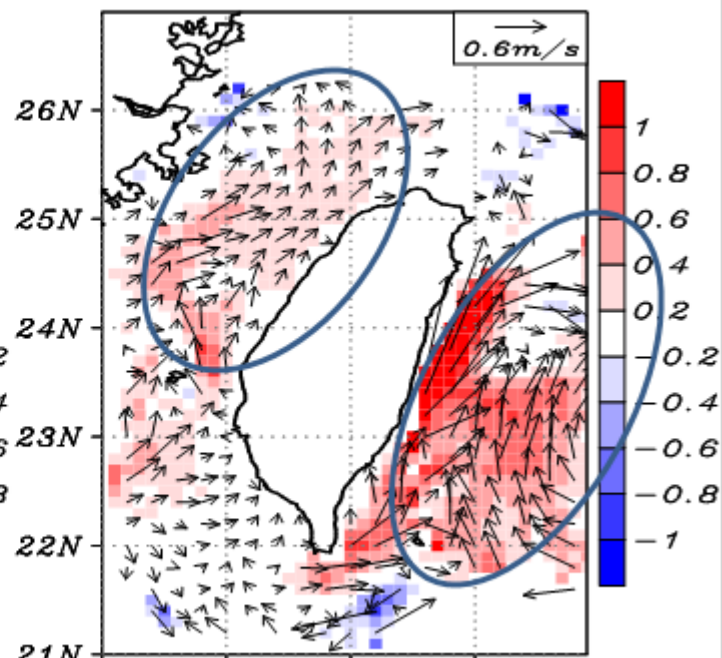
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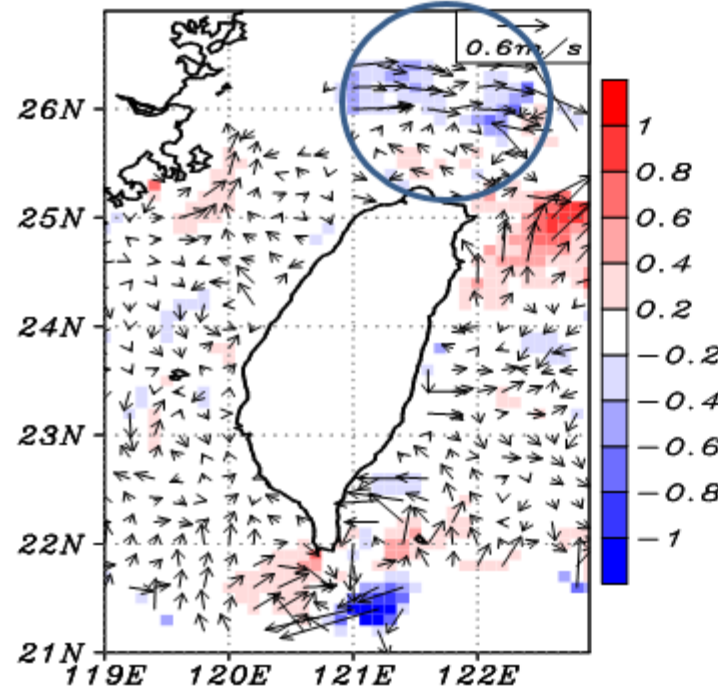
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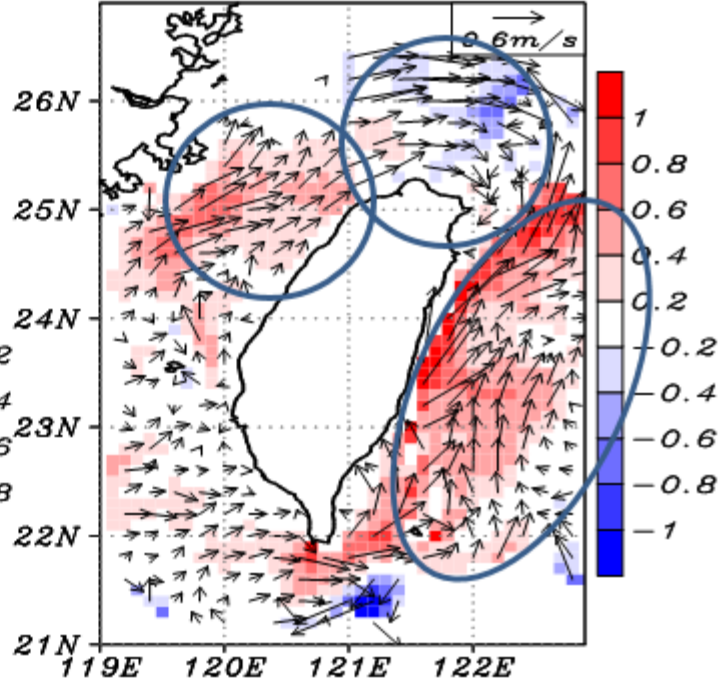
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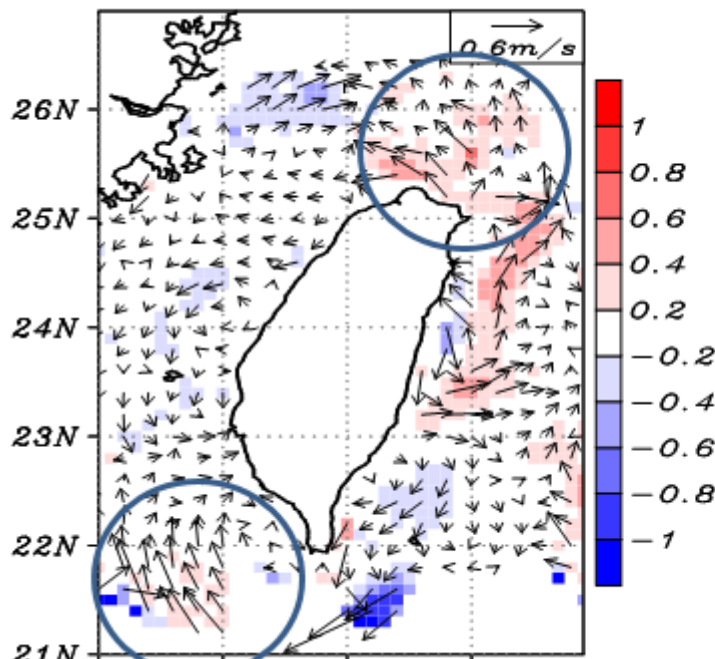
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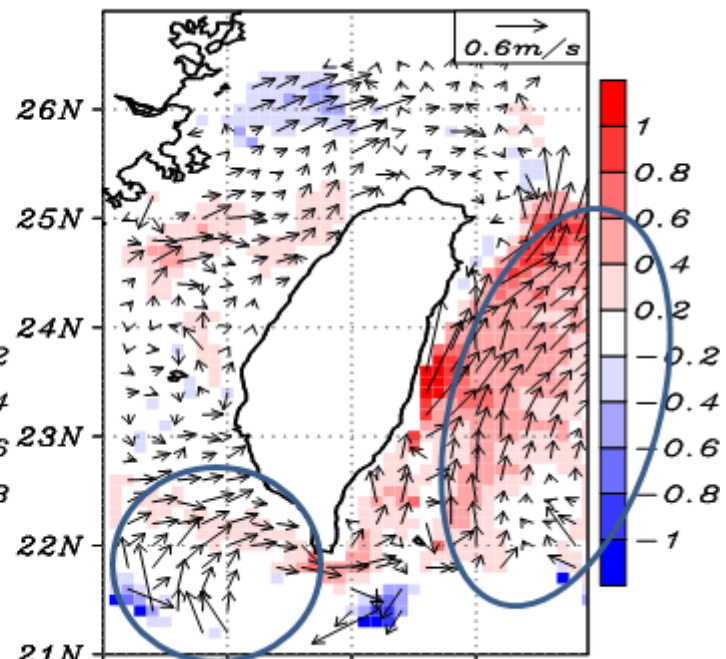
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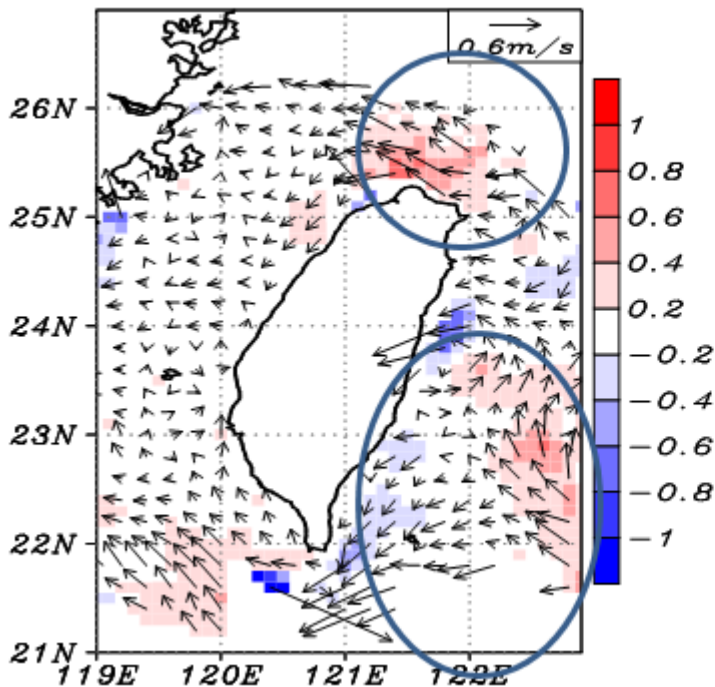
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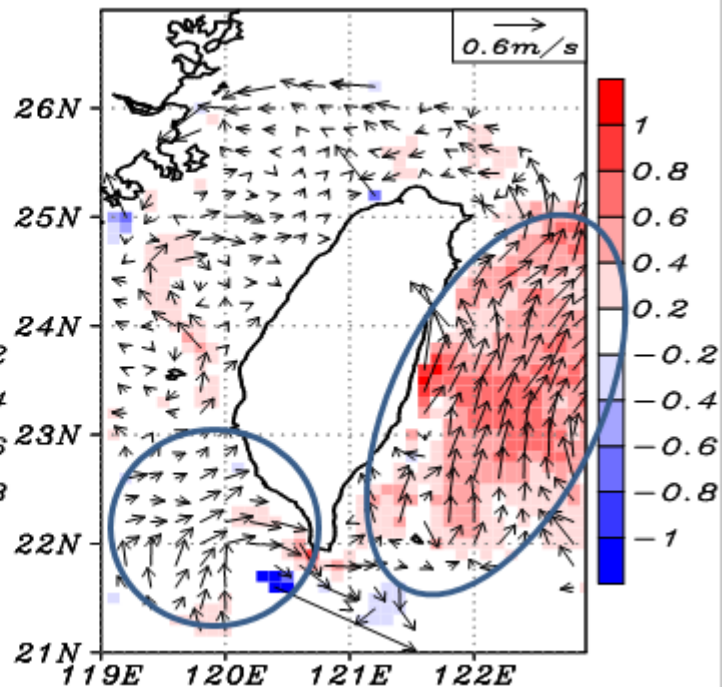
POM-TOROS 201809



NCOM-TOROS 201810



POM-TOROS 201810



結論與未來展望

- 定性比對TOROS結果，OP_NCOM結果較佳於OP_POM
- 預報準確度定量分析
- 更新OP_POM海洋開口邊界值
- 啟動OP_POM, OP_NCOM資料同化功能

簡報結束

敬請指教