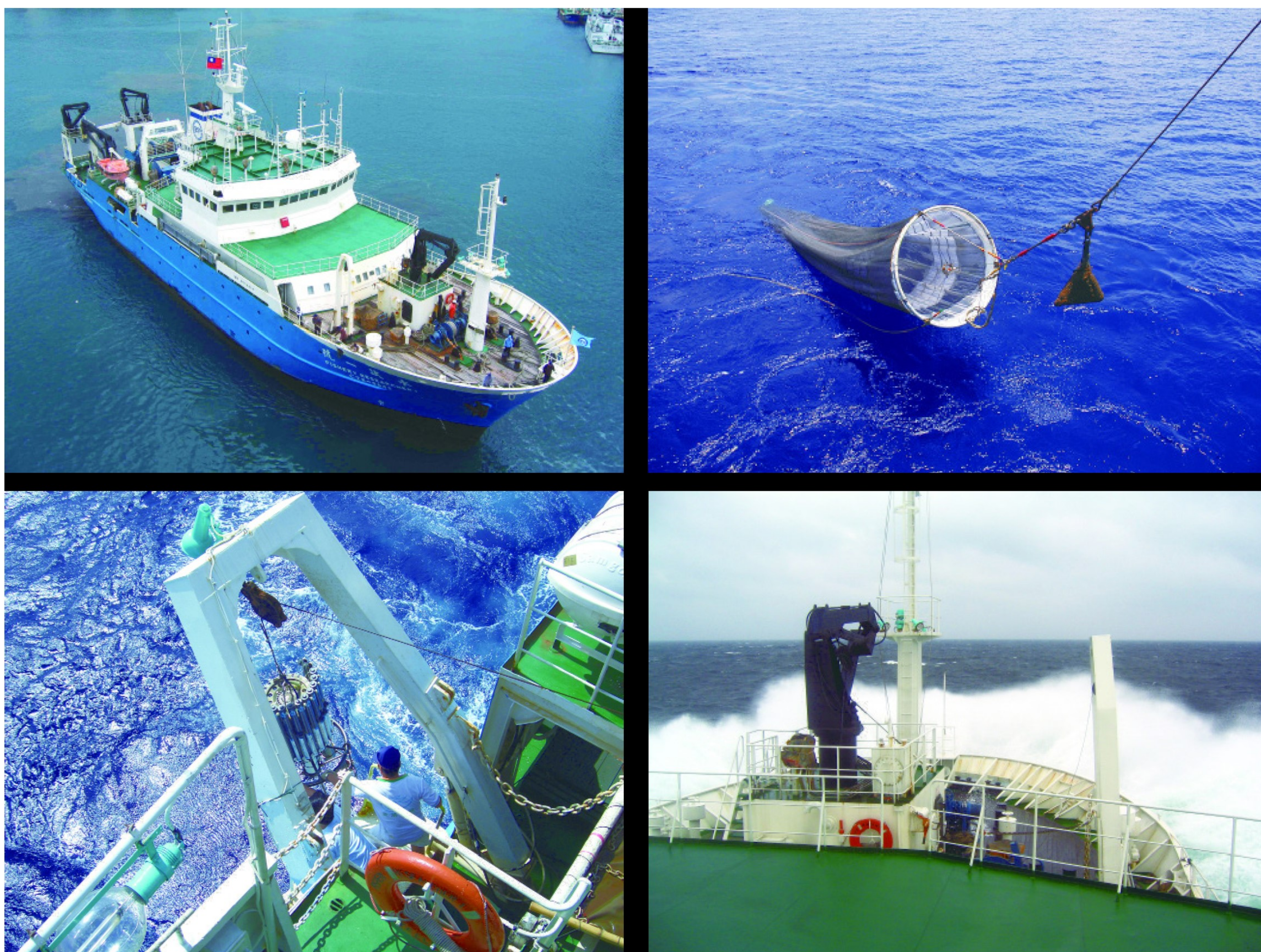




Cruise Report of TaiCOFI Surveys in 2012

2012年台灣周邊海域漁場環境監測航次報告



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序

藍色經濟為當前全球所重視的議題，強調與海洋的調和共生以發展永續性的海洋經濟。台灣每年漁業產值可達農業生產約四分之一，在糧食自給率上領先其他農糧生產部門，在國際貿易上更是長年的出超國，故漁業乃台灣重要的海洋產業，不論在優良蛋白質來源及帶動總體經濟發展均提供了重要貢獻。因此，如何透過試驗研究以增進漁業資源永續利用為本所重要的關鍵性任務。

台灣周邊海域擁有豐沛的海洋資源與生物多樣性，具有得天獨厚的沿近海漁業環境，然而面對全球氣候變遷、海域生態環境破壞及漁業資源過度利用等各項挑戰之下，導致沿近海漁業資源與產量呈現衰退的趨勢。水產試驗研究乃漁業永續發展的重要基礎工作，台灣周邊海域的基礎調查、漁業資源評估及漁場創新乃本所責無旁貸的必要性工作。

本所自 2003 年起執行「台灣周邊海域漁場環境監測計畫」，運用漁業試驗船「水試一號」與「水試二號」及其配備的各項科儀設備，持續於周邊海域各測站蒐集水溫、營養鹽、葉綠素及浮游生物等漁場環境資訊，以提供學術研究及永續漁業管理作為重要參考依據。此外，本計畫並出版航次報告以雙語方式記載彙錄同仁們辛苦出海採樣調查的成果，希冀將所獲得之各項漁場環境資訊作為接軌國際、漁業管理與學術應用之橋梁，進而為周邊海域漁業發展奠定良好之基礎，作為達成資源永續利用的重要基石。

所長

郭慶老

謹誌

中華民國一零三年十二月

Preface

Marine economy is an important issue worldwide, emphasizing the sustainable use of the marine resources. In Taiwan, the value of annual fishery production reached one fourth of the total production of the agricultural sector and the degree of self-sufficiency of fishery was also the highest among other food items. Besides, Taiwan is a trade-surplus country in fishery products for a long time. Thus, fishery has been an important fundamental industry in Taiwan. The benefit of fishery in economy and food security is considerable. Therefore, how to utilize the resources sustainably is a crucial responsibility for fishery researchers of Fisheries research institute (FRI)

The waters of Taiwan is abundant in marine resources and biodiversity. However, marine capture fishery in Taiwan was encountering the challenge of climate change, deterioration of the marine environment, and the decline of fishery resources. Thus, FRI has dedicated to researches to achieve the goals of sustainable utilization of fishery resource. FRI implemented the Taiwan Cooperative Oceanic Fisheries Investigations (TaiCOFI) program to investigate in the hydrography and fisheries resources in the surrounding waters of Taiwan since 2003. Now a consecutive 12 years database of marine environment was established.

FRI published a series of cruise report of TaiCOFI surveys since 2008 to provide our investigation results to the public. This year we continued to publish “Cruise report of TaiCOFI surveys in 2012”, which was written bilingually, to promote international academic exchange. We hope this project will be helpful for fishery policy making and fishery researchers, contributing more to the society, and leading fisheries in Taiwan toward sustainability.

Director

A handwritten signature in black ink, appearing to read "Chin-Lau", with a stylized flourish at the end.

Fisheries Research Institute

前言

近年來由於全球氣候變遷及海洋環境污染問題日益嚴重，許多國家已致力於海洋環境及生物資源之基礎探測與資料庫之建置。然以往我國有關海洋方面之研究計畫多侷限於局部海域之短期研究，觀測線或觀測點常隨計畫主題改變而改變，缺乏長期而有系統性的調查資料，再者，多數計畫係以海洋物理化學為研究重點，漁業研究學者欲將這些資料應用在水產資源研究上，著實不易。

有鑑於此，水產試驗所於 2003 年起著手實施「台灣周邊海域漁場環境監測」計畫，於周邊海域設置 62 個測站按季蒐集水溫、鹽度、營養鹽、葉綠素、浮游動物等漁場環境資訊，嘗試透過此全面性之調查來瞭解台灣周邊海域長期水文、海況及漁業生物時空分佈資訊，進而掌握影響台灣周邊海域漁業資源變動的機制。多年來，承蒙各方提供寶貴之經驗與建議，不斷改進海洋探測科儀操作及採樣相關流程，在本所同仁與國內相關學術單位的共同努力下，無論在各項科儀操作效率、漁場環境調查技術或漁業生物研究上均已小有成果。

本專刊彙集本所於 2012 年執行「台灣周邊海域漁場環境監測」計畫（農委會科技計畫編號：101 農科-11.2.2-水-A1(1)）之調查成果，計畫執行之海上採樣作業流程、各調查項目實驗室檢測流程、各航次出海採樣及樣本分析人員均有詳述於後，此外，利用 Surfer 軟體以圖示方式刊出台灣周邊海域之水溫、鹽度、營養鹽、葉綠素、浮游動物及基礎生產力等漁場環境因子之調查成果以供各界參考。本計畫內容涉及廣泛專業領域，也由於人力及經驗的關係，雖戮力以赴亦難免有疏漏不周之處，希冀各界先進不吝賜教斧正。

Introduction

With the changing of climate and the growing of marine environmental pollutions in recent years, many countries have devoted to establishing their database for marine environment and aquatic living resources. However, in the past, marine research programs in Taiwan were mostly confined to a short time scale and of a limited region. Besides, transects or stations of surveys were usually changing with the changing of projects, resulted in a scarcity of long term and systematic observations of waters around Taiwan. Furthermore, most programs were aimed at marine chemistry and physics studies. It is hard for fishery scientists to incorporate that information into fishery stock assessment.

As a result, Fisheries Research Institute implemented 「Taiwan Cooperative Oceanic Fisheries Investigations, TaiCOFI」 program in 2003 to conduct quarterly cruises to collect water temperature, salinity, nutrients, chlorophyll-*a* and zooplankton measurements at 62 stations in the surrounding waters of Taiwan. Through this thorough investigation, we try to understand the coupling of physical, chemical and biological dynamics in the surrounding waters of Taiwan to figure out the factors associated with the fluctuation of fishery resources. For the past years, we really appreciated for the valuable advices from academic communities to improve our field sampling techniques and operation procedures of marine observation instrument. With the hardworking of our staff members and associated academic organizations, now we have preliminary achievements in the operating efficiency of marine observation instruments, fishing ground investigation techniques and fisheries biology research.

The data presented in this report were collected during four cruises in 2012 of the TaiCOFI program. Data from the cruises were collected and processed by personnel of FRI and Professor Cheng Shiue-Yuan of National Taiwan Ocean University participated in the analysis of primary productivity. Standard procedures of field program and sample analysis are described in detail and the distribution of water temperature, salinity, nutrients, chlorophyll-*a*, zooplankton and primary production are illustrated in figures for each cruise. Finally, we will extent our special thanks for your advices to improve this cruise report.

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海上採樣作業流程

在台灣周邊海域選定 62 個測站，利用水試一號試驗船及其裝備，按季節別於 2012 年 1 月、4 月、8 月及 10 月，進行下列之工作項目：

1. CTD 溫鹽調查：

採用 Seabird SBE-911PLUS 溫鹽深儀 (CTD)，每測站均投放至 1000 m (水深不足之測站則以實際水深少 10 m 為原則)，取得溫深鹽之連續資料。

2. 分層採水：

利用 General Oceanics 之自動採水瓶，採取 5、25、50、75、100、150 m 等水層之海水各 2000 ml。

3. 葉綠素甲測定：

取各層海水 1000 ml，利用 Millipore 濾紙過濾後，以 -20°C 急速冷凍保存，再攜回實驗室檢測。

4. 營養鹽類測定：

分別收集各層海水 100 ml，以液態氮(-196°C)急速冷凍保存後，再攜回實驗室檢測。

5. 浮游動物採集：

以 ORI 網下放至 200 m 深(水深不足之測站則以實際水深少 5 m 為原則)，以 1 m/s 速度上揚，取得之樣本以 5% 福馬林海水溶液保存，再攜回實驗室測定生物量及分類。

Field Observations

The survey was carried out in the waters surrounding Taiwan by *Fishery Researcher I* during quarterly cruise in January, April, August and October in 2012. The following procedures were conducted at each station.

1. Temperature and salinity:

CTD, Seabird SBE-911PLUS, was lowered from the surface to 1000 m (or 10 m above the bottom for shallow areas).

2. Water sampling for chlorophyll-*a* and nutrients:

The Rosette (GO-1015), mounted on the frame of CTD, were sequentially closed and collected 2 liter water sample at specific target depths (5, 25, 50, 75, 100, 150 m) as the CTD was raised.

3. Chlorophyll-*a* concentration measurement:

One liter of sea water samples were immediately filtered through Whatman GF/F filter papers and then put in -20°C refrigerator for chlorophyll-*a* concentration measurement in the laboratory.

4. Nutrients concentration measurement:

100 ml of sea water samples for each depth were collected and then put in liquid nitrogen (-196°C) for nutrients concentration measurement in the laboratory.

5. Sampling gear and methods for zooplankton:

The ORI net, with a 1.6 m diameter mouth opening, 6 m in length and 0.333 mm meshes, was towed obliquely to 200 m (for shallow areas, 10 m above the bottom) at each station. The net opening is fastened with a short 3-lead bridle connected to several meters of line which attached to the towing cable by a clamp. A General Oceanic flowmeter is suspended across the center of the net mouth to measure the amount of water filtered during each tow. The net was towed at a ship speed of 1.0 knots for about 10 minutes. After the net was on board, samples were pouring into the PVC bottle and preserved immediately in 5 % formalin buffered with sodium borate.

樣本實驗檢測流程

壹、營養鹽、葉綠素及基礎生產力之測定流程

取各水層水樣急速凍結保存後，分析各水層之硝酸（nitrate）、磷酸（phosphate）、矽酸（silicate）等營養鹽，另外將濾畢各層海水之濾紙以丙酮溶解萃取出葉綠素分析其葉綠素甲濃度；利用光暗瓶溶解氧法，分析台灣周邊海域之基礎生產力（primary productivity）。

1. 硝酸測定：

硝酸以 Wood-Armstrong-Richard 法測定，將過濾之試水通過銅-鎘還原管，使硝酸還原成亞硝酸，然後加入 Sulfanilamide 及 NED 溶液，於分光光度計上以 542 nm 測定吸光值並計算其濃度，另取同樣試水不經銅-鎘還原管，直接測定水中之亞硝酸濃度，將經過銅-鎘還原管之數值扣除水中亞硝酸之濃度後，依銅-鎘還原管之還原率計算水中硝酸之濃度。

2. 磷酸測定：

磷酸以 molybdenum blue (ascorbic acid) 法測定，將過濾後之試水加入以 Ammonium molybdate、Sulfuric acid、Ascorbic acid 及 Potassium antimonyl tartrate 所配製的還原溶液，待其成色後在分光光度計以波長 885 nm 測定吸光值並計算待測物之濃度。

3. 矽酸測定：

矽酸以 silicon molybdenum blue 法測定，將過濾之試水先後添加 50 % HCl、10 % Ammonium molybdate 及 10 % Oxalic acid 後，加入以 1-amino-2-naphthol-4-sulfonic acid、Na₂SO₃ 及 NaHSO₃ 所配製的還原試劑，混合完成後於分光光度計上以波長 815 nm 測定其吸光值，由各波長之吸光值並計算待測物之濃度。

4. 葉綠素甲測定：

葉綠素甲以 Trichromatic 法測定，將各水層過濾後的濾紙，分別加入丙酮研磨後，放入恆溫培養箱（4 °C）24 小時之後，將樣品置於冷凍離心機 4 °C、轉速 3000 rpm 離心 15 秒後，分別取出上清液，使用分光光度計測其各波長之吸光值後由公式(Jeffrey and Humphrey, 1975)計算葉綠素甲濃度。

5. 基礎生產力測定：

將試水分別裝入錫箔紙包覆之暗色溶氧及透明瓶中，分別進行光度恆溫培養，經 24 小時後，測定溶氧瓶中水樣始末之溶氧差，換算成碳生產力即得。

貳、浮游動物鑑種及計數流程

返航後先將樣品靜置，以便後續分量。

分樣：

取一瓶樣品，將其上部的澄清液先用小塊 100 目網布過濾直至網布上有浮游動物出現為止，然後先將樣品瓶中的動浮液倒入小燒杯中，再利用洗滌瓶將樣品瓶中及網布上的浮游動物完全沖洗至小燒杯內，再將採樣回來的樣品瓶上標籤撕下，貼在一個 150 ml 的標本瓶上。接著，將小燒杯中的動浮液倒入分樣器中，將分樣器左右擺動約十次，然後站在分樣器前方目測左右數量是否一致，若一致再將其倒出，倒出後會分為兩部分，將其中一部分裝入剛才貼有標籤的 150 ml 的標本瓶（該瓶分量为 1/2），將剩下的那一部分再倒入分樣器內進行分樣，重複上述步驟。直到目測該分量的樣品中約有 1000 隻左右浮游動物為止。

鑑種及計數：

將該測站的最小分量樣本瓶中的動浮液倒入培養皿，將裝有動浮液的培養皿擺上顯微鏡的載物台計數及鑑種，計數時以 Z 字的方法依序計數，一個方格內的動浮算完再算下一個方格，鑑一隻就按一下該種的計數器，緩慢移動培養皿，該培養皿算完後，將其倒入 250 ml 的燒杯中，再算第二盤直到將該最小分量樣本瓶中的動浮液全數算完，此時確認計數器的值全部加起來是否有超過 2000 隻，若超過 2000 隻，該測站即計算完畢；若尚未超過 2000 隻，則將另一瓶還未計算的最小分量樣本瓶的動浮液全數算完，若仍然小於 2000 隻，就再將上一分量的樣本瓶的動浮液全數算完，直到計數器全部加起來有超過 2000 隻，該測站樣本才算計數完畢。

生物沉澱量、排水容積、濕重：

1. 生物沉澱量：取 100 ml 沉澱管，將管中的水位都標定到 100，靜置一個晚上後，目視生物沉澱量刻度，在記錄沉澱管上的數值時需要往下數一格，以減少誤差。
2. 濕重：將一測站之樣本倒入沉澱管中，並注意沉澱管中樣本之容積之刻度，在將沉澱管中之樣品倒入吸引器中，將其樣本浮游動物與樣本液分開，吸至浮游動物沒有多餘之樣本液後，將其浮游動物放入秤中量其重量，即為其濕重。
3. 排水容積：濕重測量完畢時，剩下的澄清液倒入沉澱管中觀察其刻度。

Laboratory procedures

Seawater samples were collected at discrete depths (from 5 to 150 m) for inorganic nutrients (NO_3^- 、 PO_4^{3-} 、 SiO_2^{2-})、chlorophyll-*a* (chl-*a*) and primary productivity (PP) and then were analyzed with standard methods depending on variable chemical properties in the laboratory.

1. Nitrate

Nitrate (NO_3^-) was measured by reducing nitrate to nitrite (NO_2^-) and then determining the nitrite by employing the pink azo dye method. Sulfanilamide and NED solutions were added to seawater samples and then measured by using a spectrophotometer analyzer at 542 nm for final determination of concentrations.

2. Phosphate

Phosphate (PO_4^{3-}) was determined by the molybdenum blue method. Ammonium molybdate、Sulfuric acid、Ascorbic acid and Potassium antimonyl-tartrate mixed solutions at room temperature were added to seawater samples and then measured by using a spectrophotometer analyzer at 885 nm for final determination of concentrations.

3. Silicate

Silicate (SiO_2^{2-}) was measured by the molybdenum blue method. Seawater samples were immediately acidified with 50 % Hydrochloric acid、10 % Ammonium molybdate and 10 % Oxalic acid and then 1-amino-2-naphthol-4-sulfonic acid、 Na_2SO_3 and NaHSO_3 mixed solutions was added to the samples. For final determination of concentrations, samples were measured by using a spectrophotometer analyzer at 815 nm.

4. Chlorophyll-*a*

Chlorophyll-*a* (chl-*a*) was measured by the Trichromatic method. Pigments were extracted in cold acetone (90%) for 24 hours. The samples were centrifuged at 3000 rpm under 4°C for 15 seconds and then transfer the samples extracts from the centrifuge tube to the cuvette by careful pipeting. The final determination of chlorophyll-*a* samples were measured by using a spectrophotometer.

5. Primary productivity

Primary productivity (PP) were measured by the Dissolved Oxygen method. Seawater samples were cultured in the light and dark tanks for 24 h and then measured by using a DO meter analyzer on board.

6. Zooplankton

Each plankton sample was repeatedly divided with a Folsom splitter until its subsample contained 2000 specimens of zooplankton. Zooplanktons were then sorted and classified into 30 categories. The number of each category was recorded and the abundance of each category was expressed as the number of individuals per cubic meter (inds/ m^3).

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浮游動物分類	林芝仔、潘佳怡

略語表

Abbreviations

Date	作業日期
SMT	作業開始時間
Lati.	緯度(°N)
Long.	經度(°E)
Depth	深度(m)
SST	表層水溫(°C)
Air T.	氣溫(°C)
Air P.	氣壓(mb)
Wind D.	風向
Wind F.	風速(節)
O.N.D.	作業水深(m)
Fl. Ct.	濾水器讀數
V.W.S.	濾水體積(m ³)

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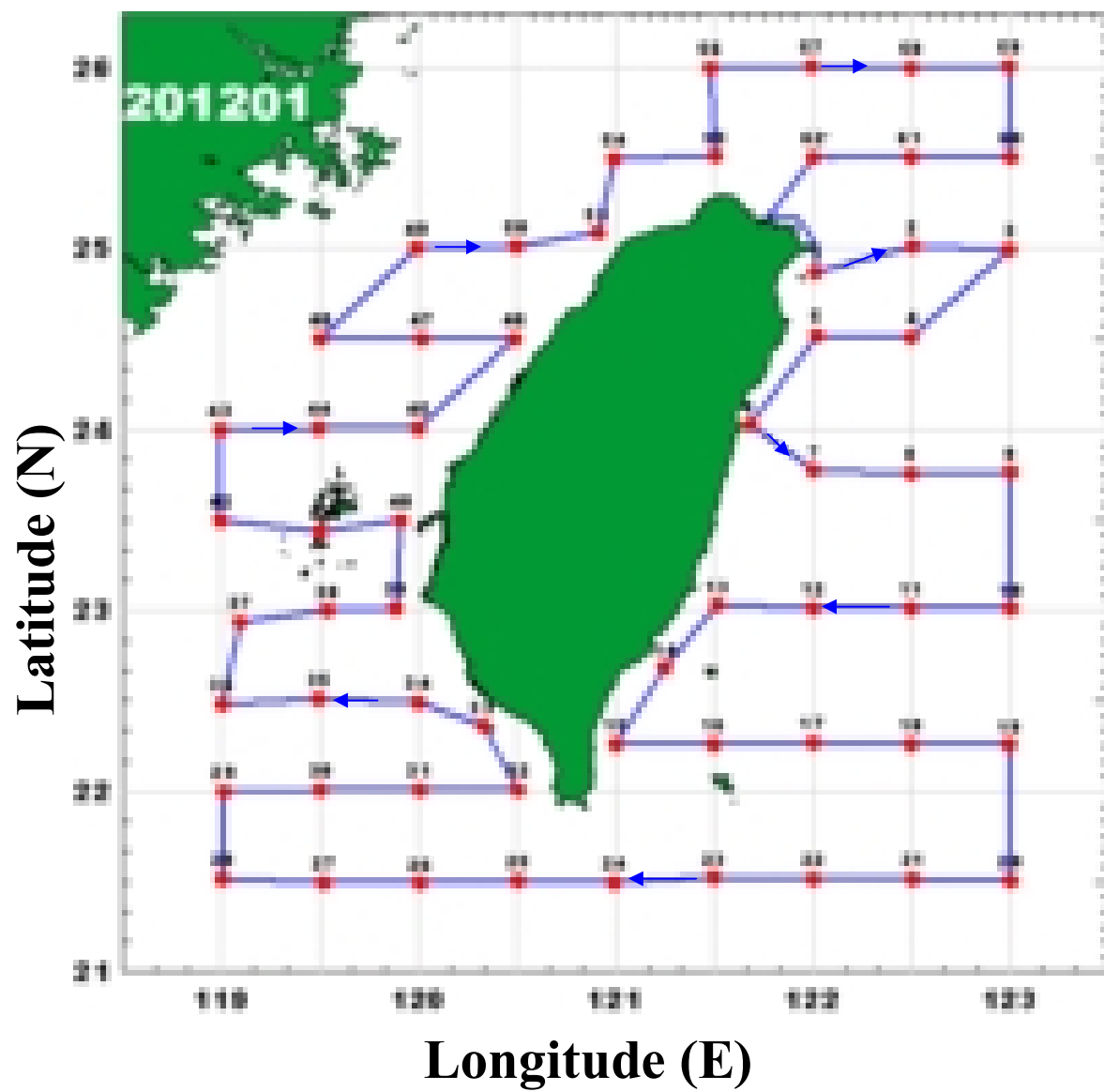


圖 01. 2012-01 航次航跡圖

Fig. 01. Stations and Cruise tracks for TaiCOFI Survey in Jan. 2012.

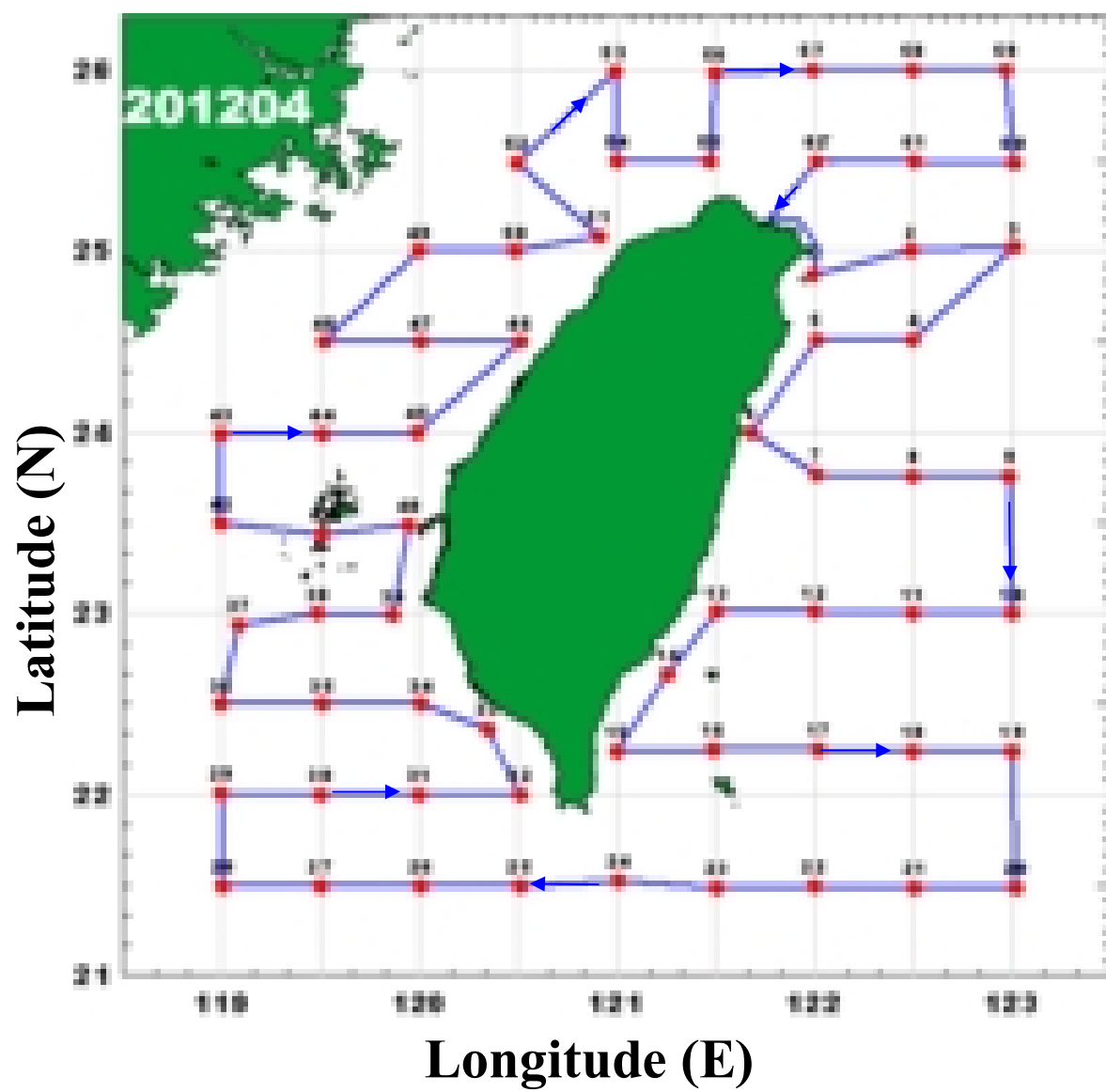


圖 02. 2012-04 航次航跡圖

Fig. 02. Stations and Cruise tracks for TaiCOFI Survey in Apr. 2012.

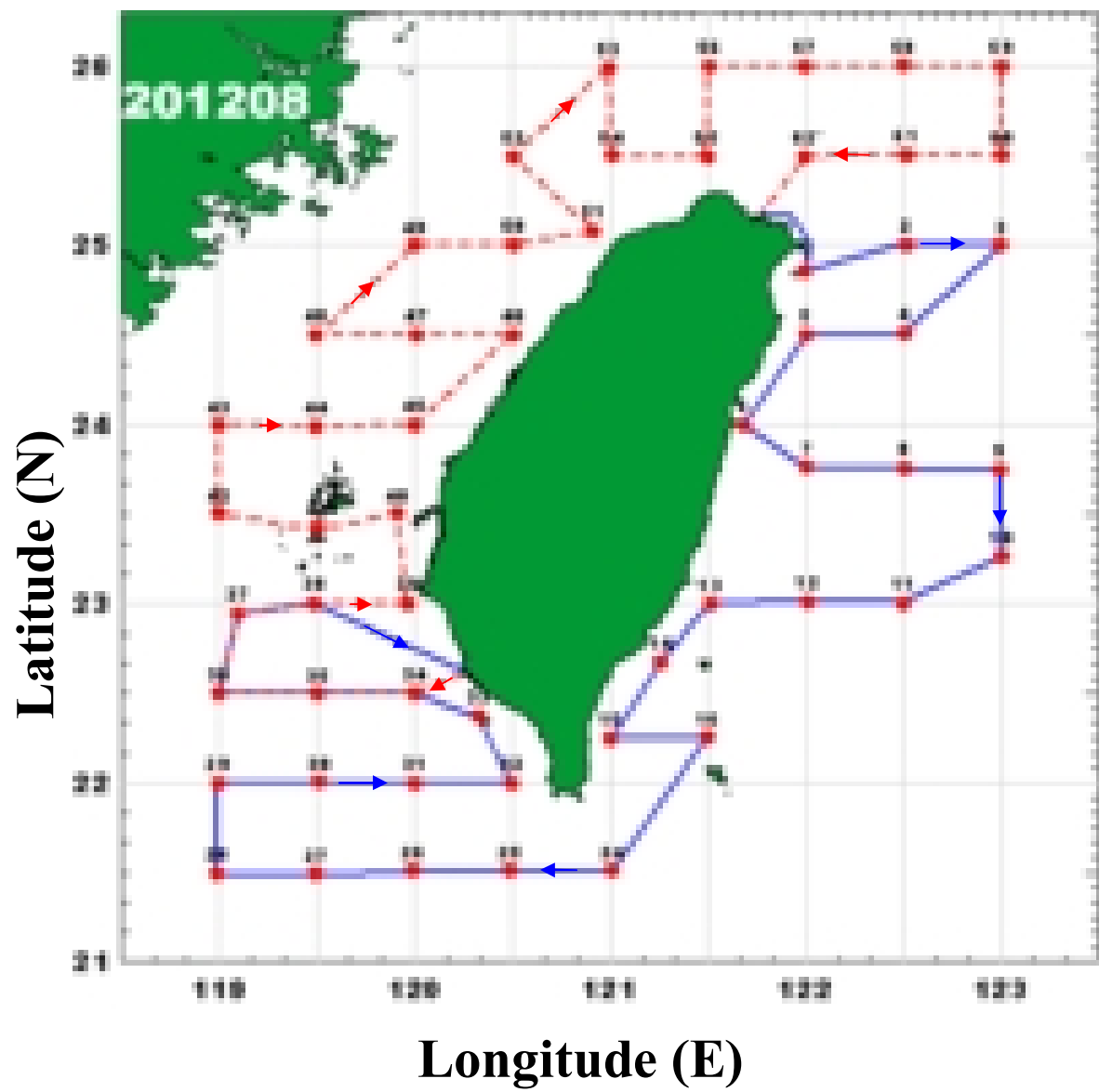


圖 03. 2012-08 航次航跡圖

Fig. 03. Stations and Cruise tracks for TaiCOFI Survey in Aug. 2012.

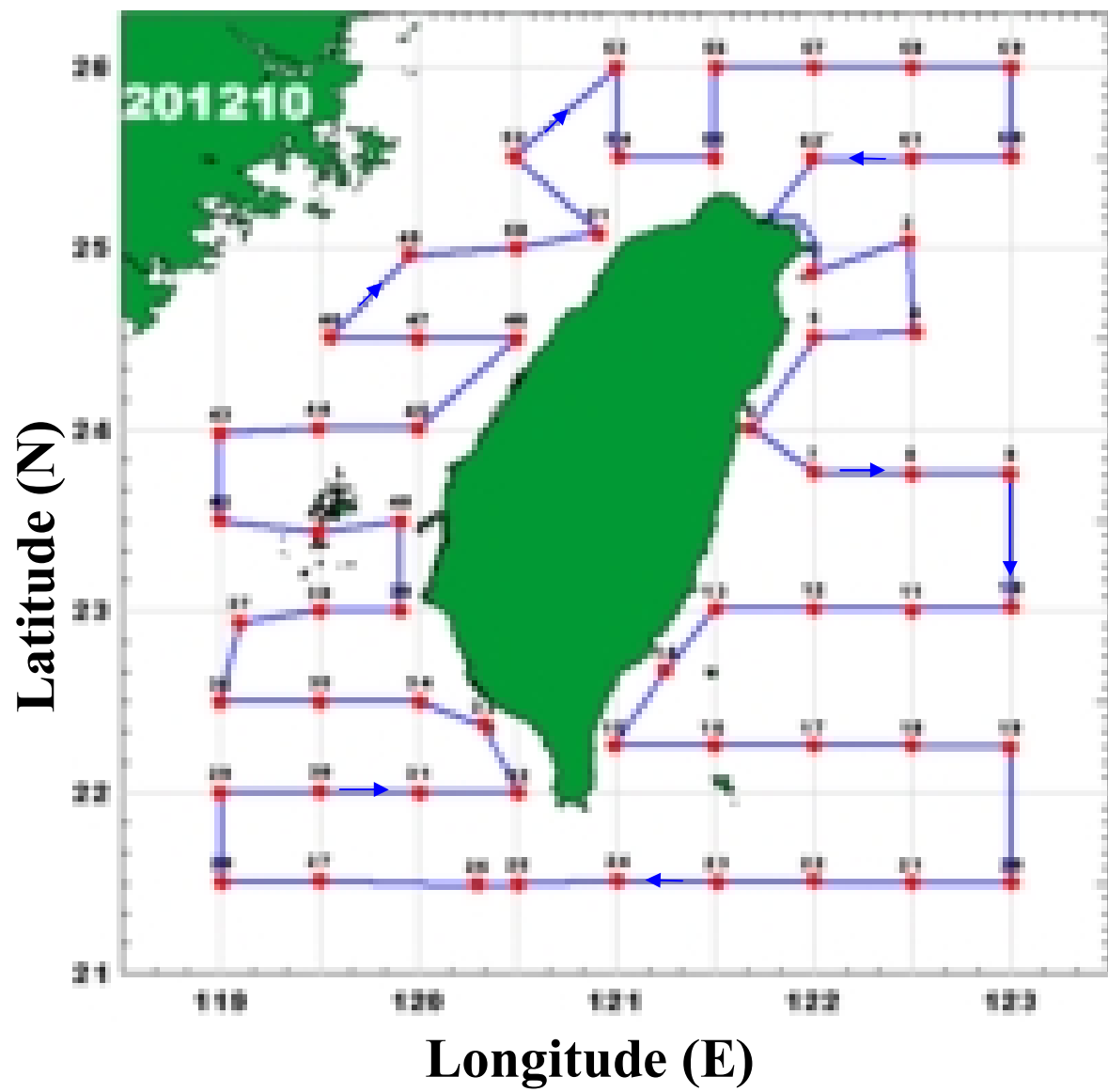


圖 04. 2012-10 航次航跡圖

Fig. 04. Stations and Cruise tracks for TaiCOFI Survey in Oct. 2012.

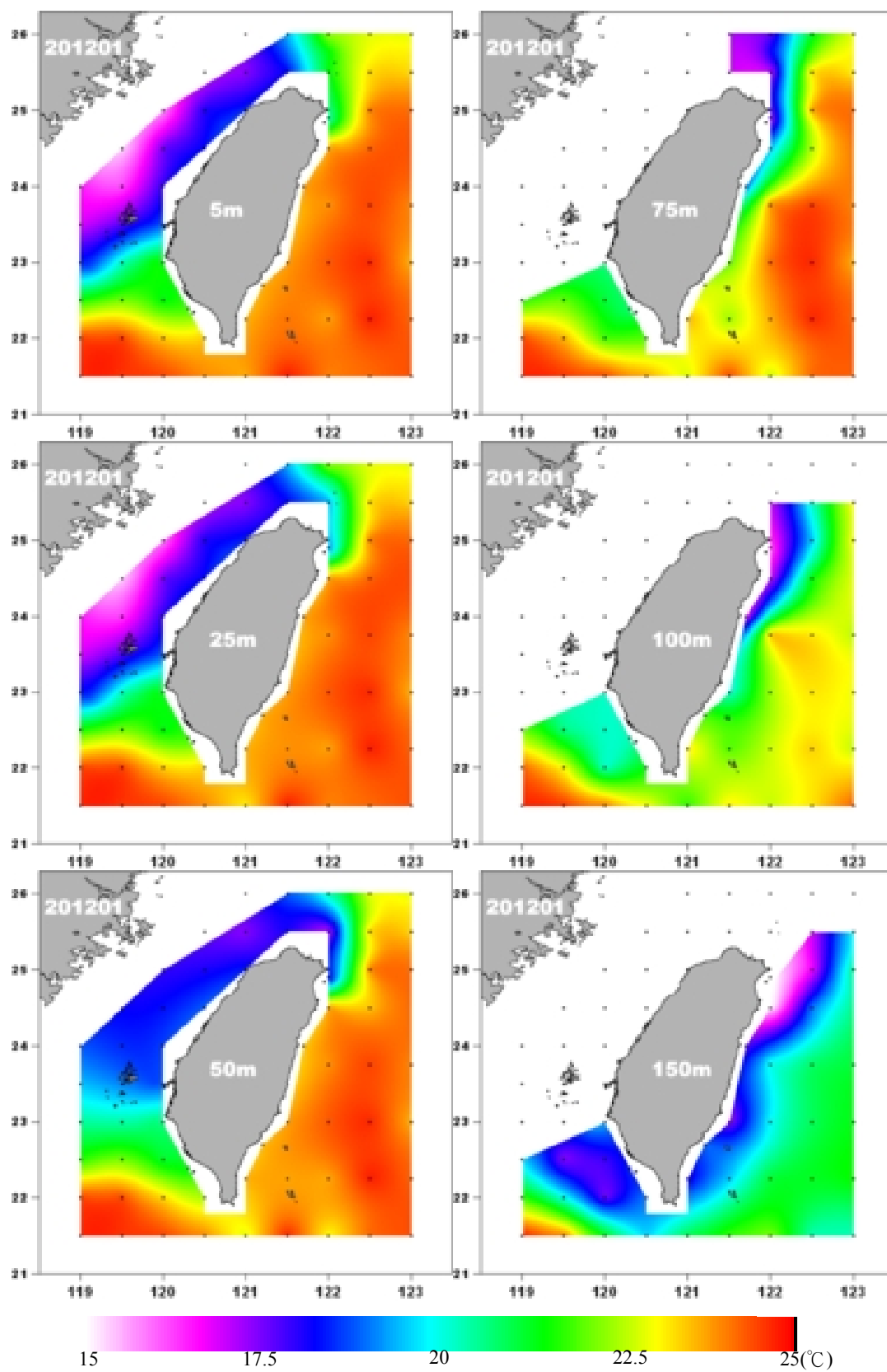


圖 05. 2012-01 航次水溫分布

Fig. 05. Temperature distribution in Jan. 2012.

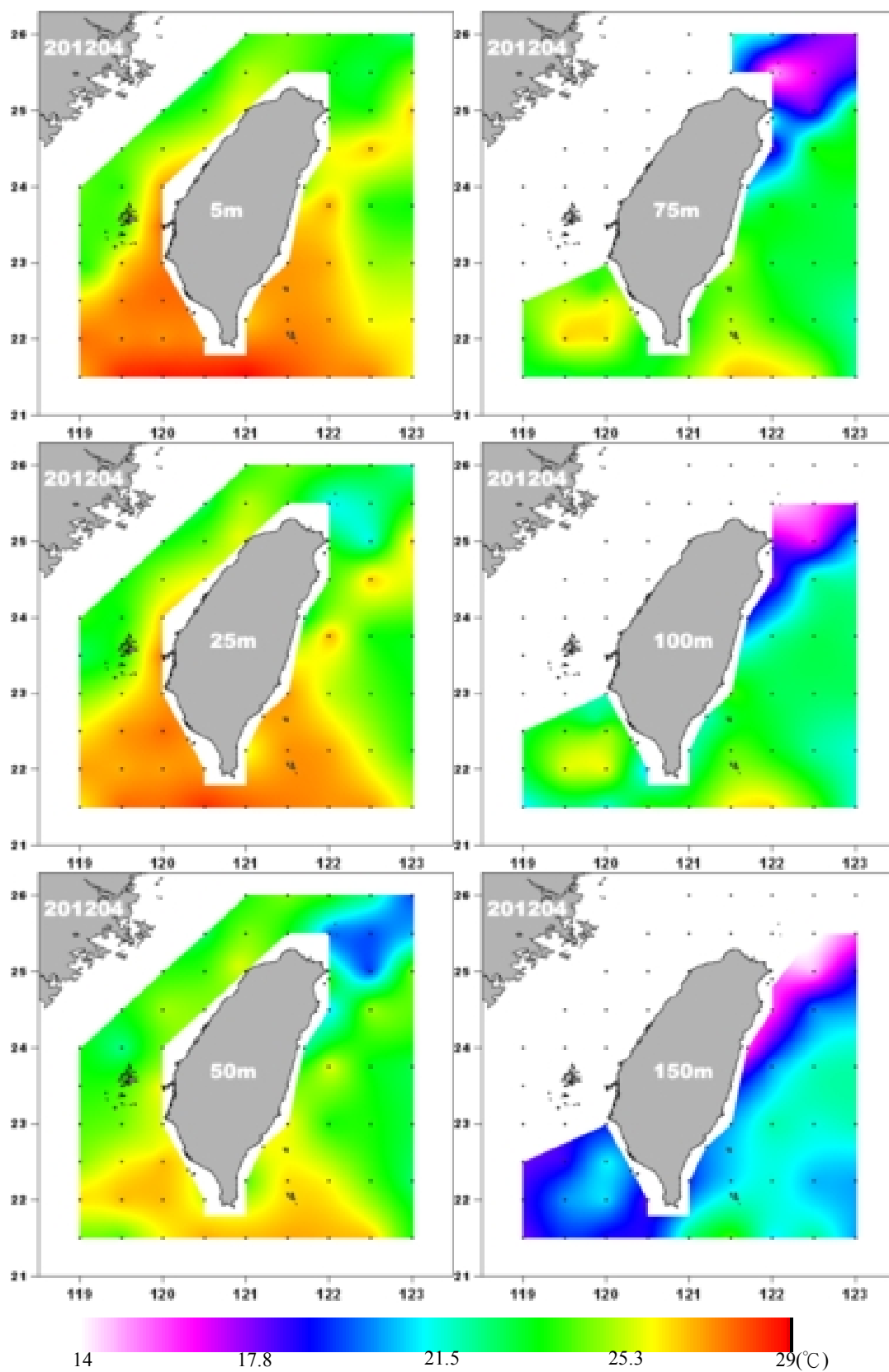


圖 06. 2012-04 航次水溫分布
Fig.06. Temperature distribution in Apr. 2012.

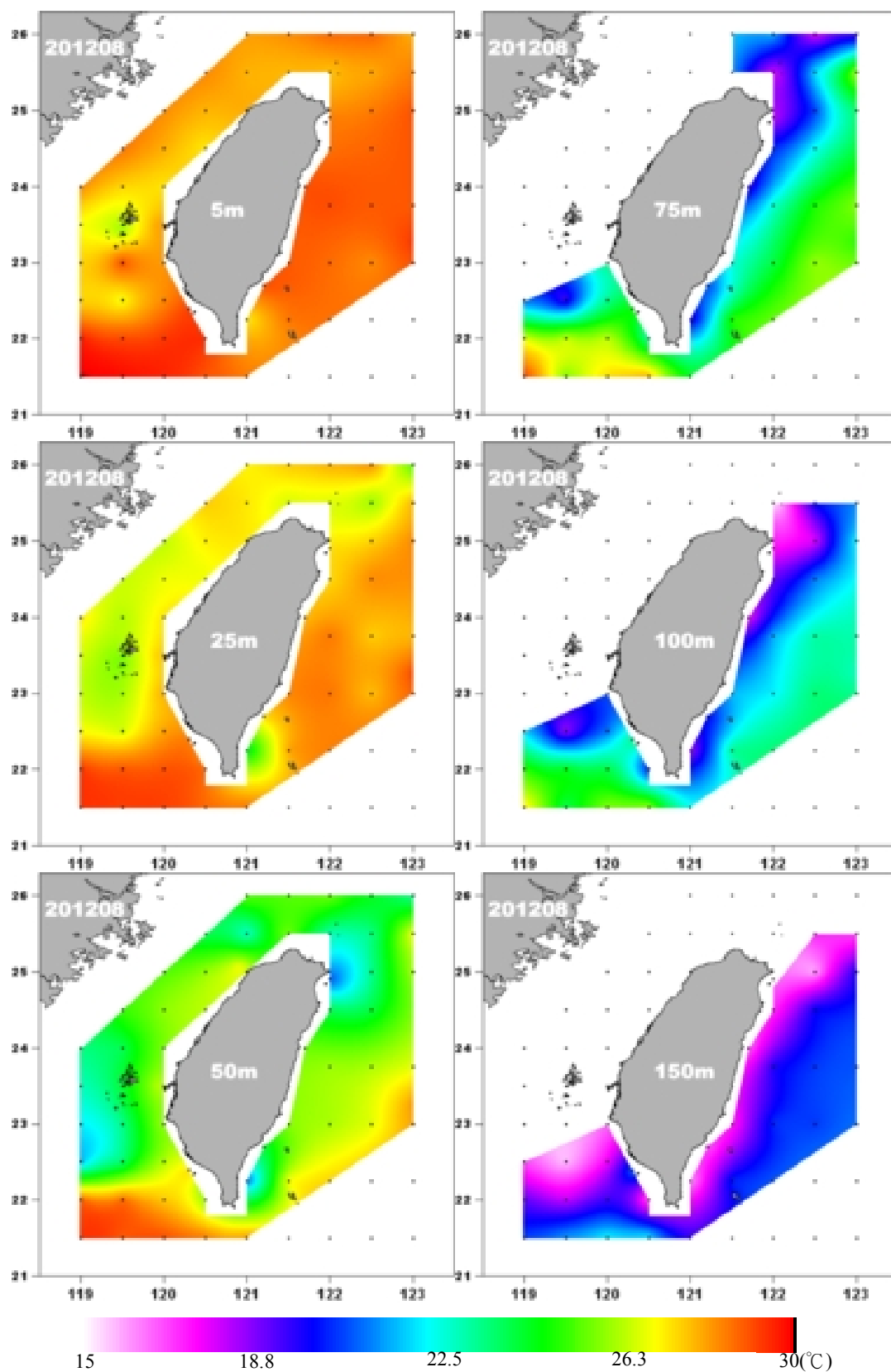


圖 07. 2012-08 航次水溫分布

Fig. 07. Temperature distribution in Aug. 2012.

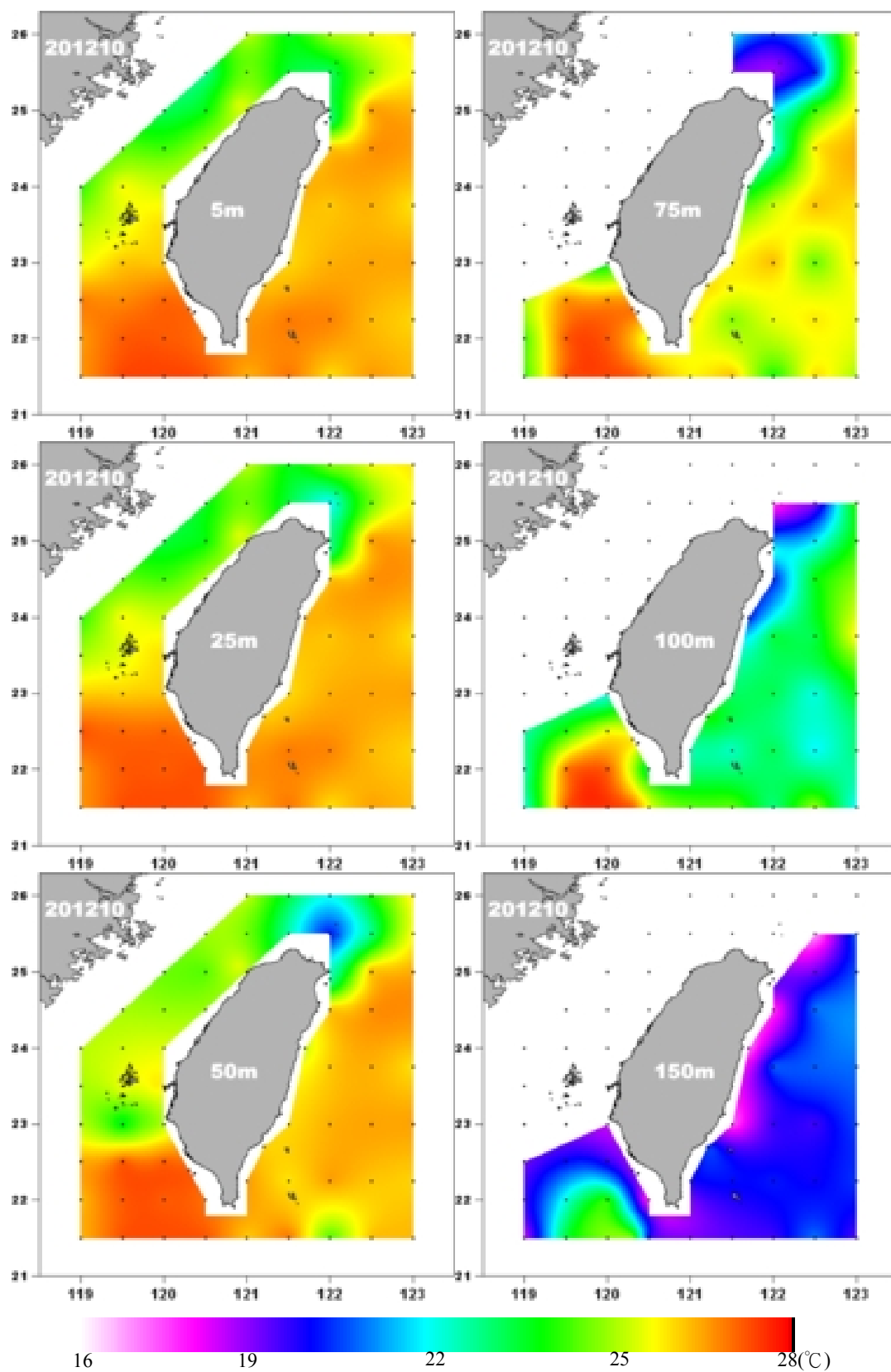


圖 08. 2012-10 航次水溫分布
Fig. 08. Temperature distribution in Oct. 2012.

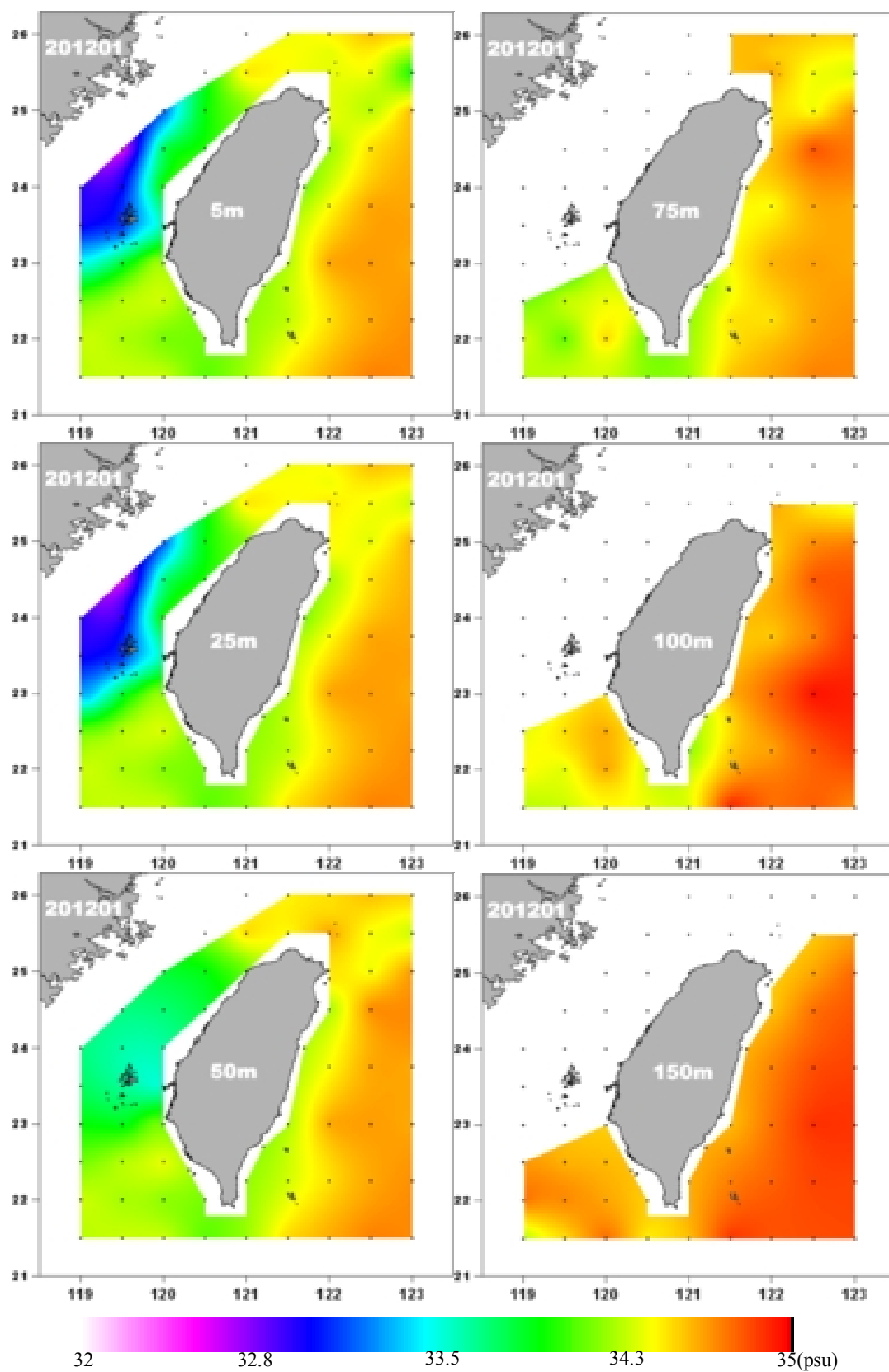


圖 09. 2012-01 航次鹽度分布
Fig. 09. Salinity distribution in Jan. 2012.

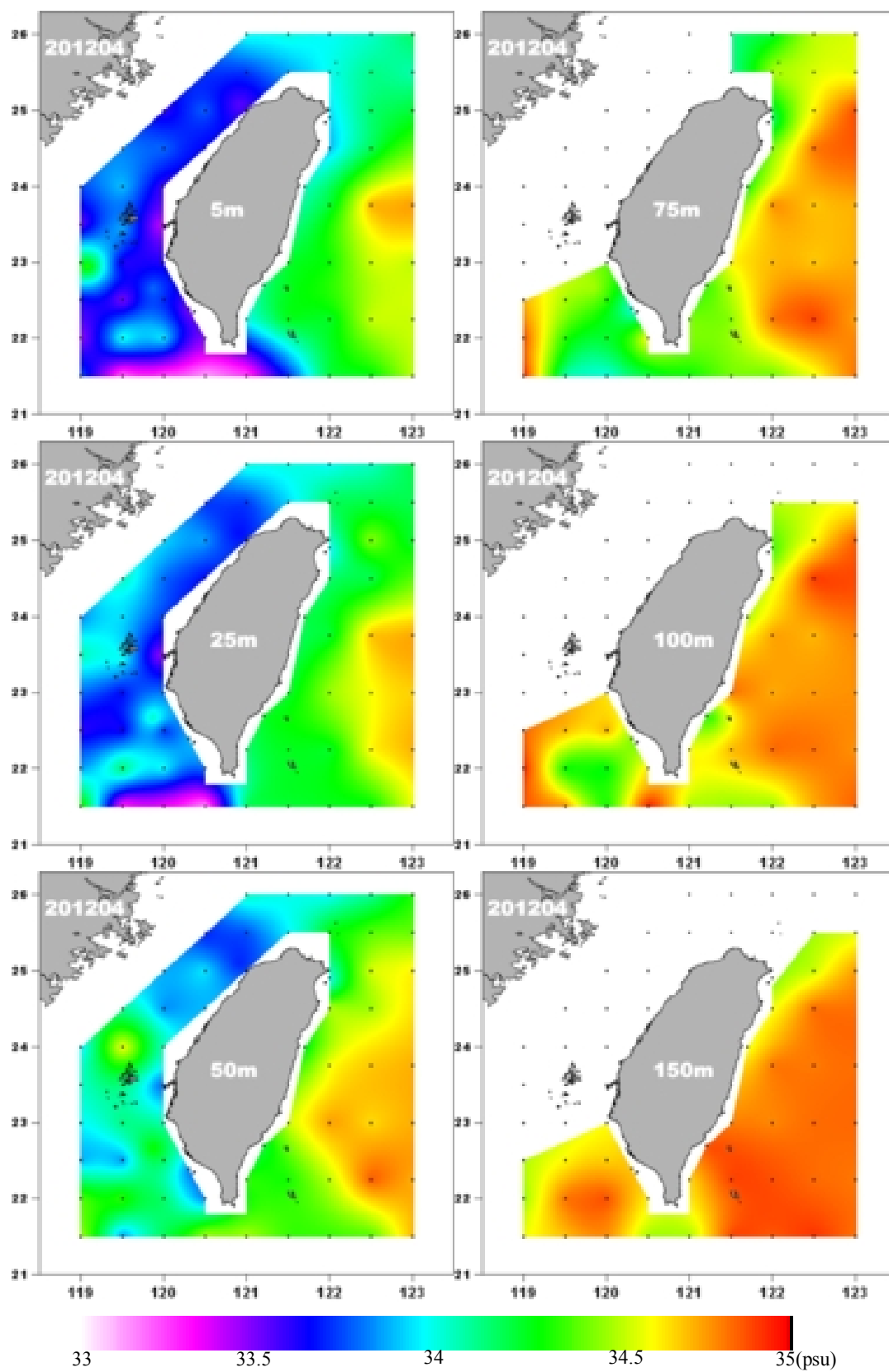


圖 10. 2012-04 航次鹽度分布
Fig. 10. Salinity distribution in Apr. 2012.

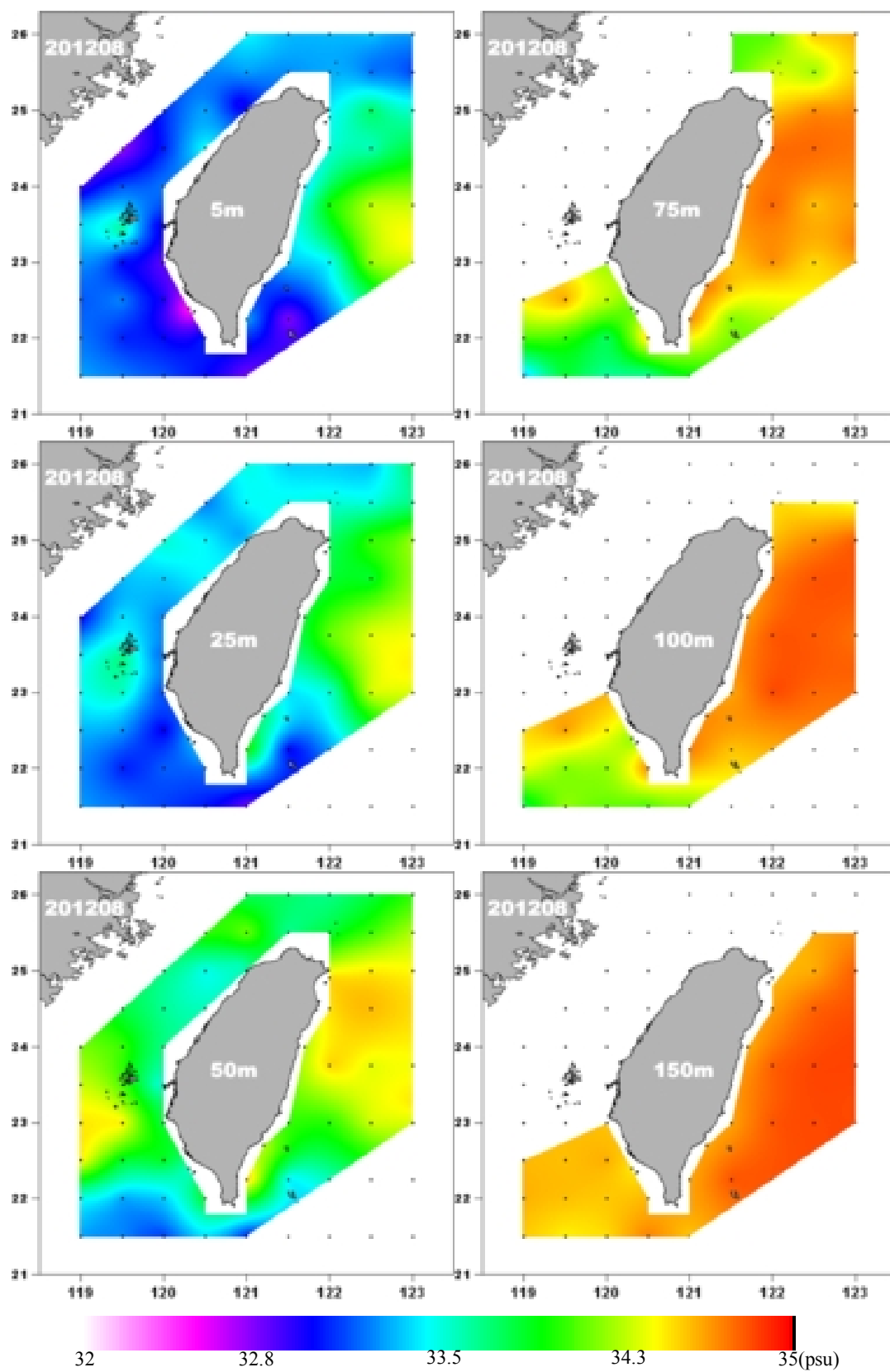


圖 11. 2012-08 航次鹽度分布
Fig. 11. Salinity distribution in Aug. 2012.

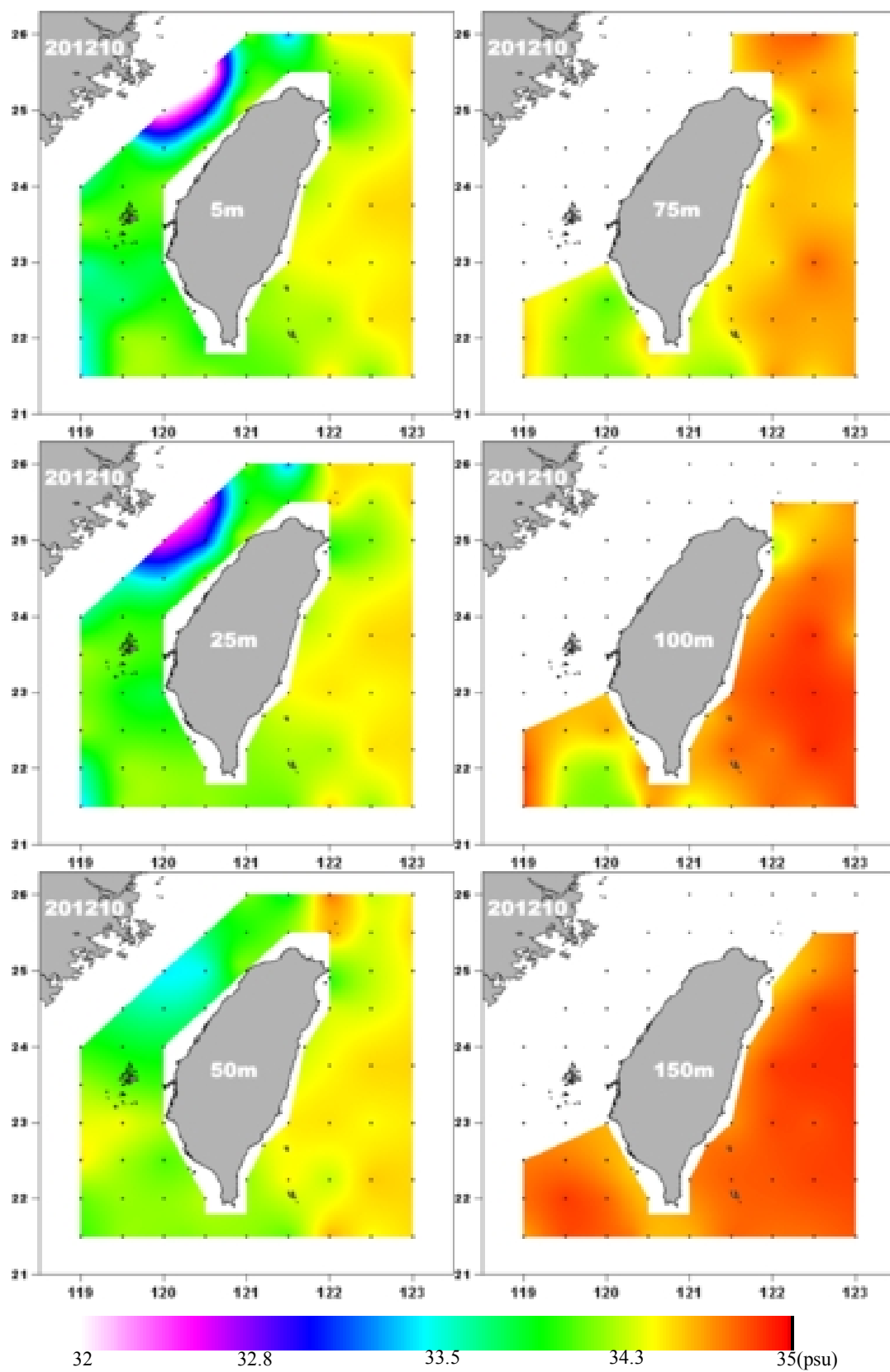


圖 12. 2012-10 航次鹽度分布
Fig. 12. Salinity distribution in Oct. 2012.

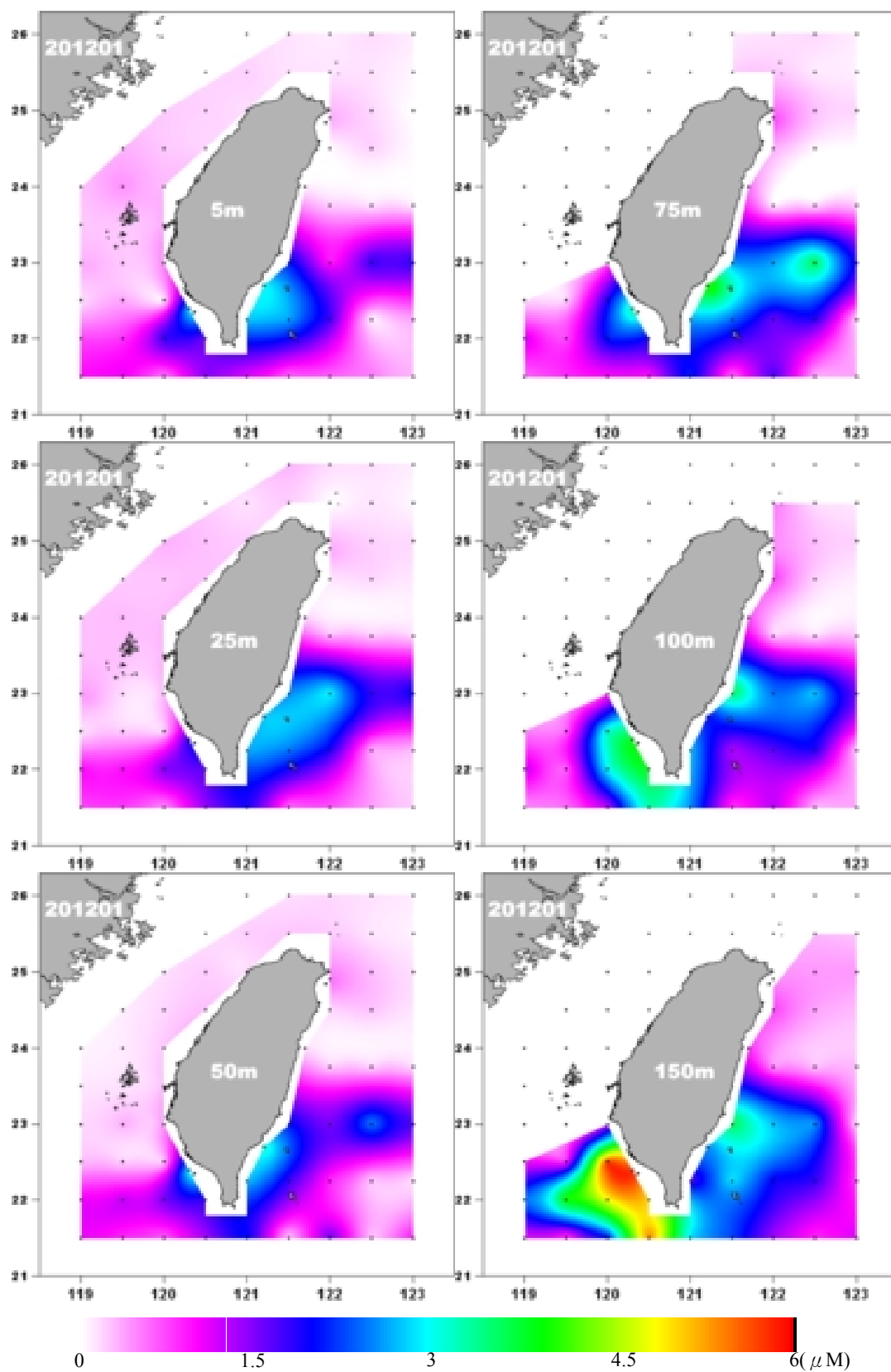


圖 13. 2012-01 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 13. Nitrate (NO_3^-) distribution in Jan. 2012.

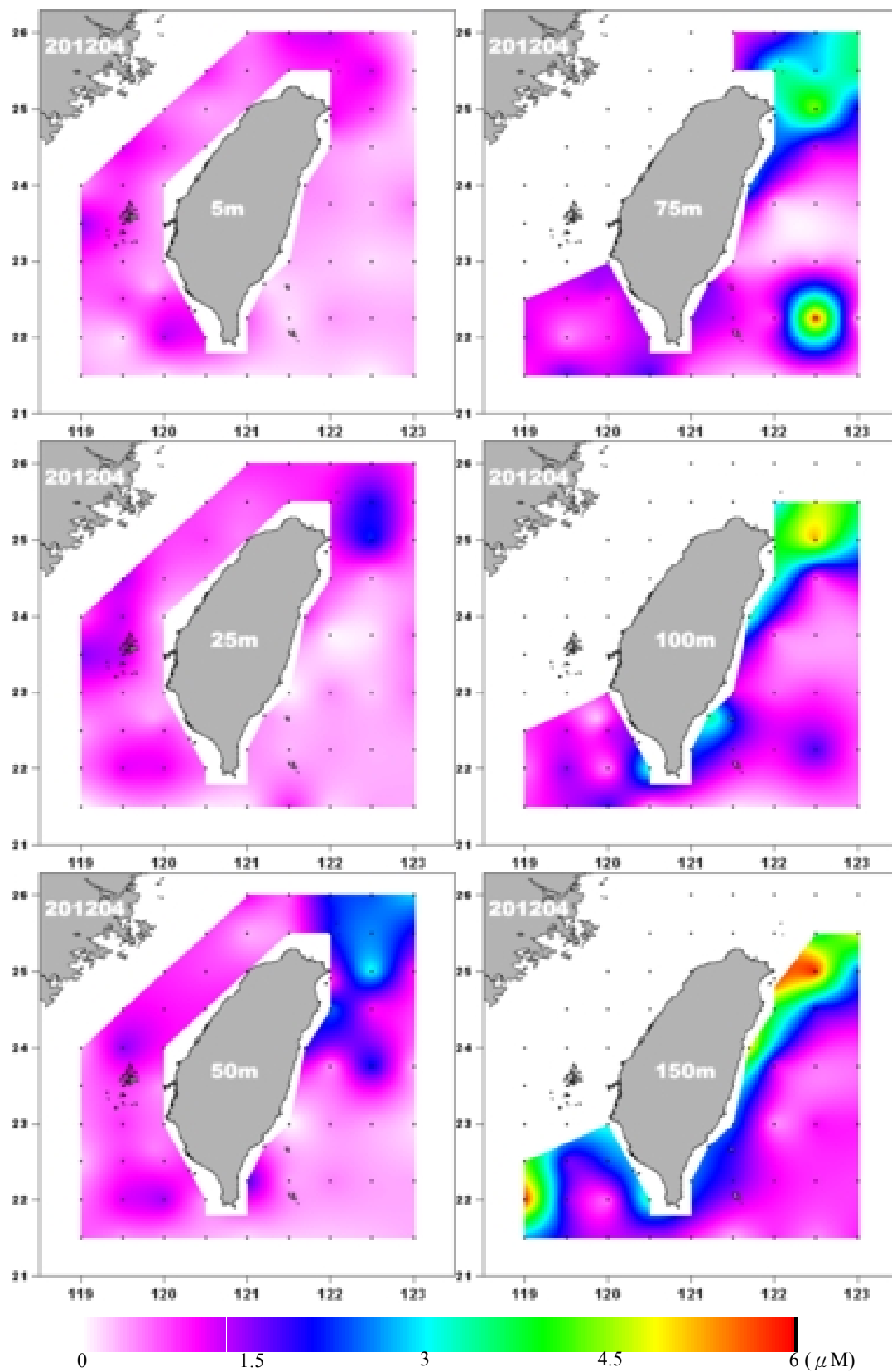


圖 14. 2012-04 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 14. Nitrate (NO_3^-) distribution in Apr. 2012.

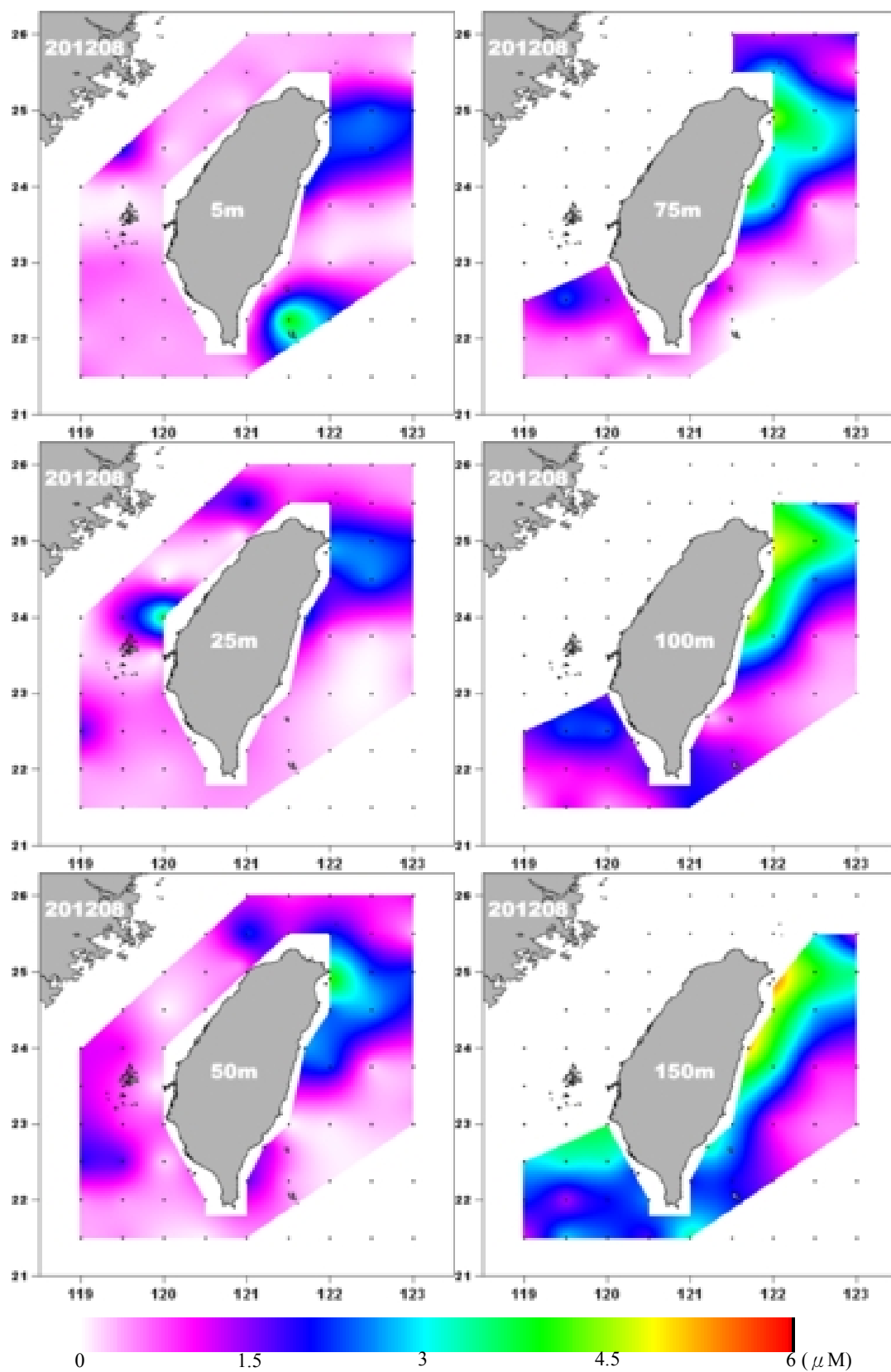


圖 15. 2012-08 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 15. Nitrate (NO_3^-) distribution in Aug. 2012.

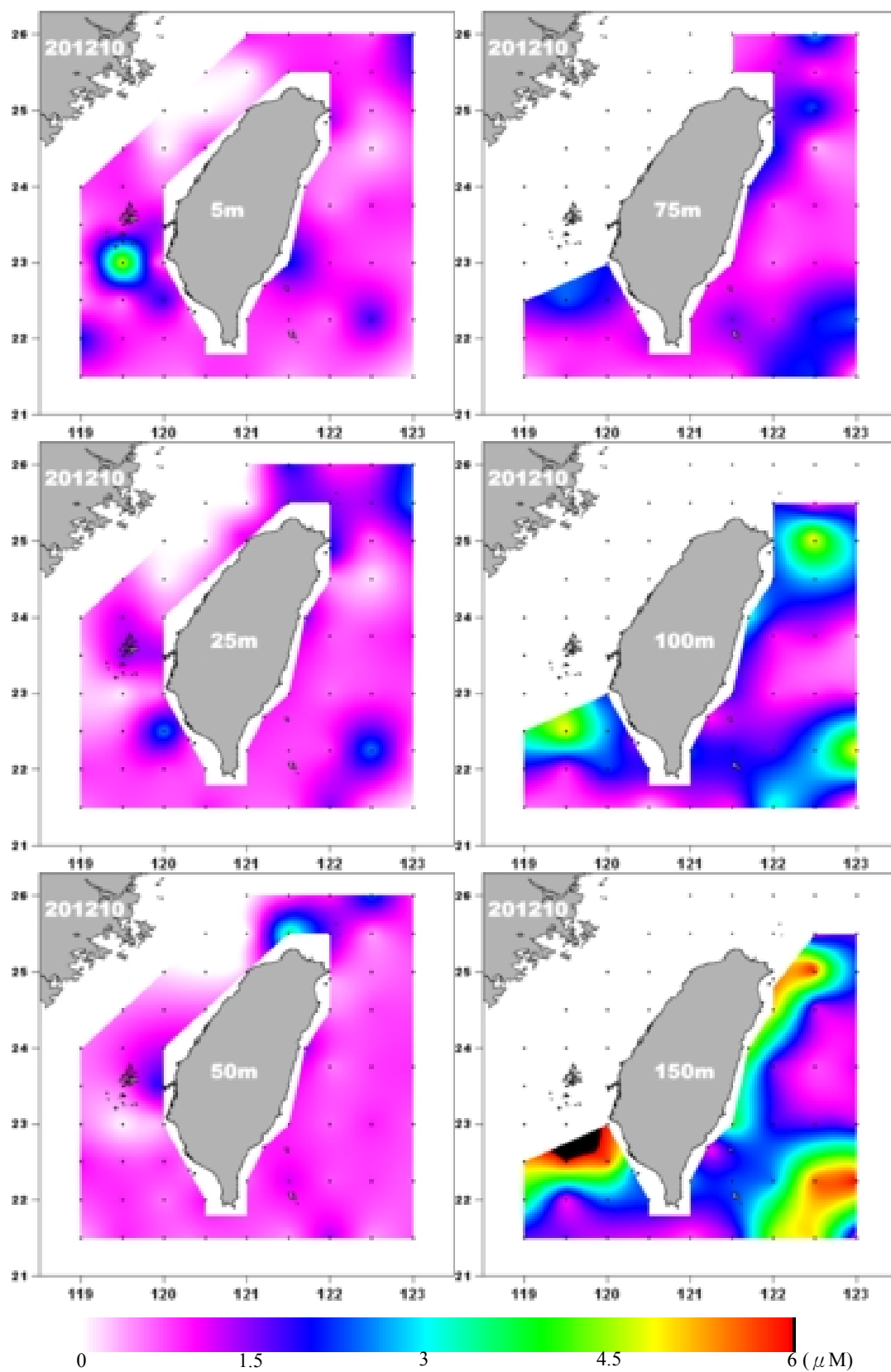


圖 16. 2012-10 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 16. Nitrate (NO_3^-) distribution in Oct. 2012.

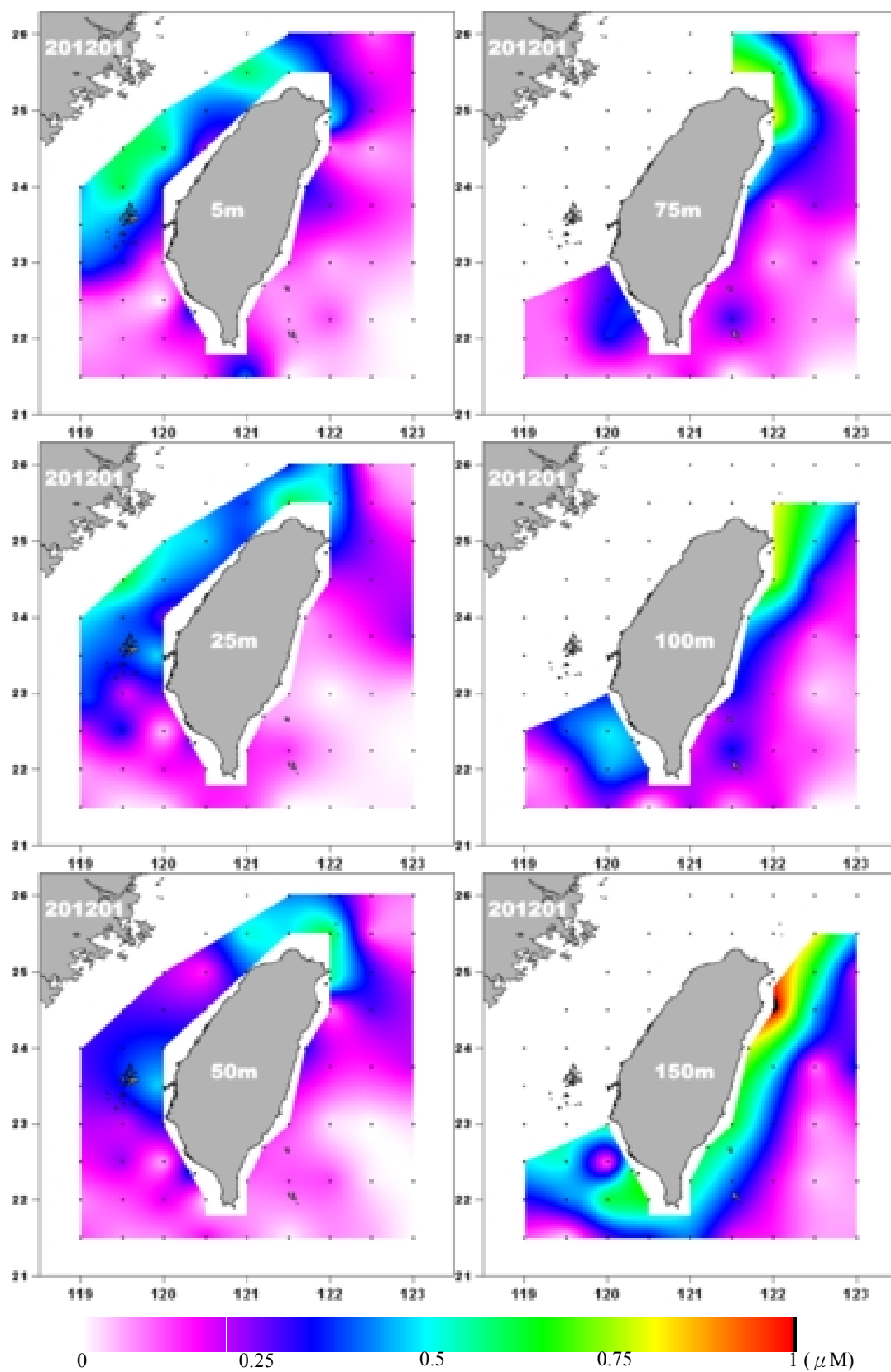


圖 17. 2012-01 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 17. Phosphate (PO_4^{3-}) distribution in Jan. 2012.

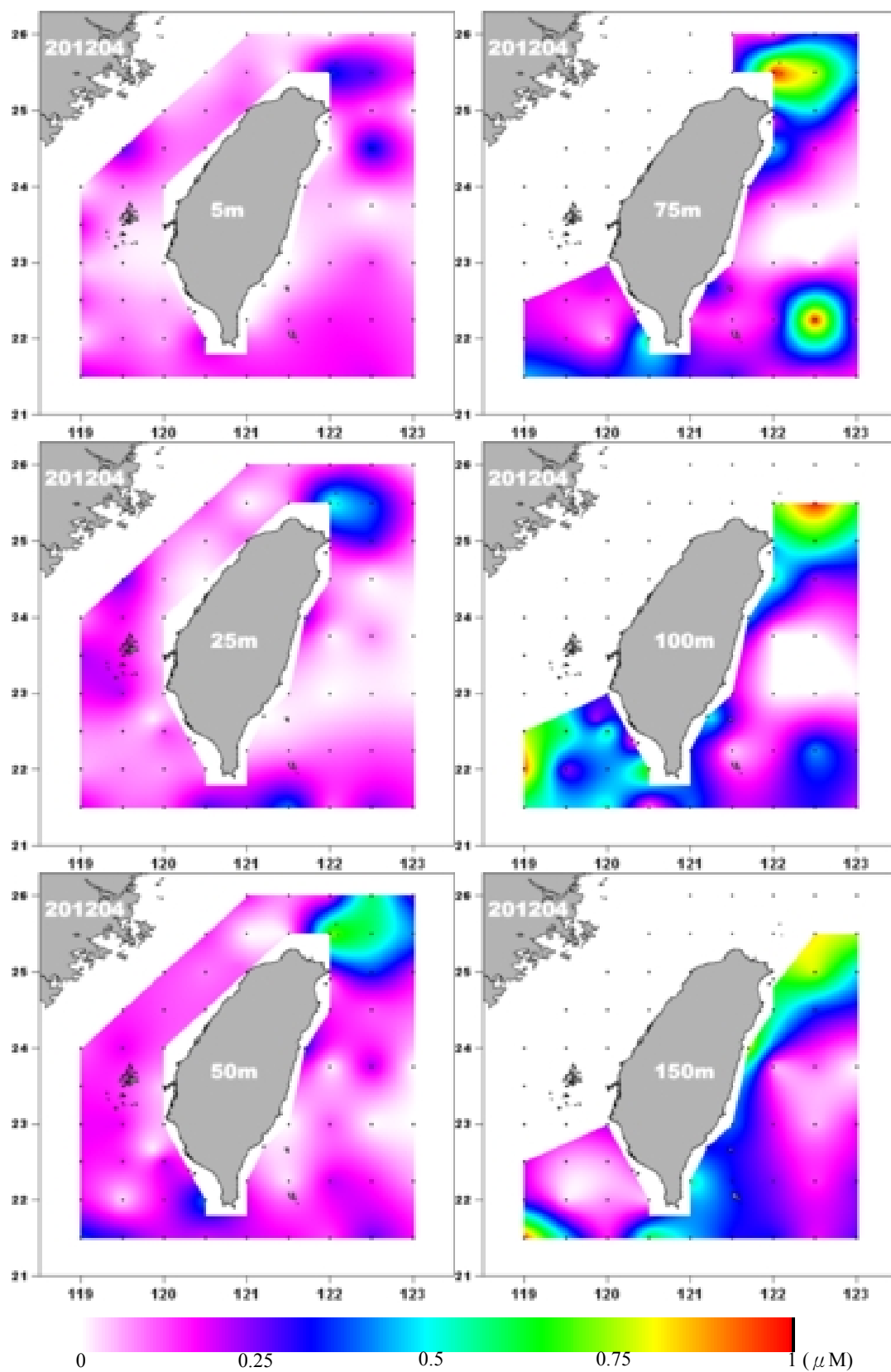


圖 18. 2012-04 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 18. Phosphate (PO_4^{3-}) distribution in Apr. 2012.

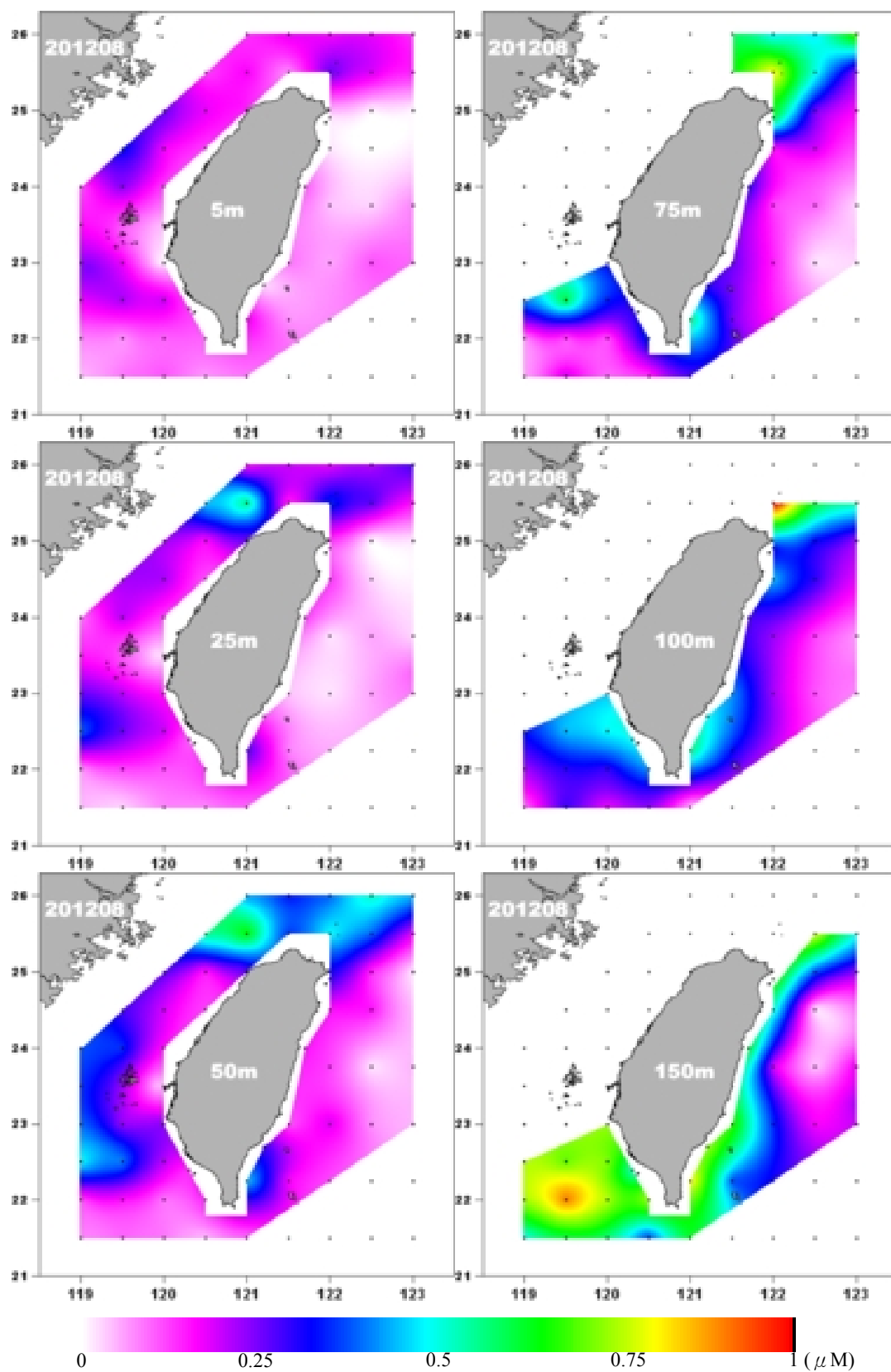


圖 19. 2012-08 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 19. Phosphate (PO_4^{3-}) distribution in Aug. 2012.

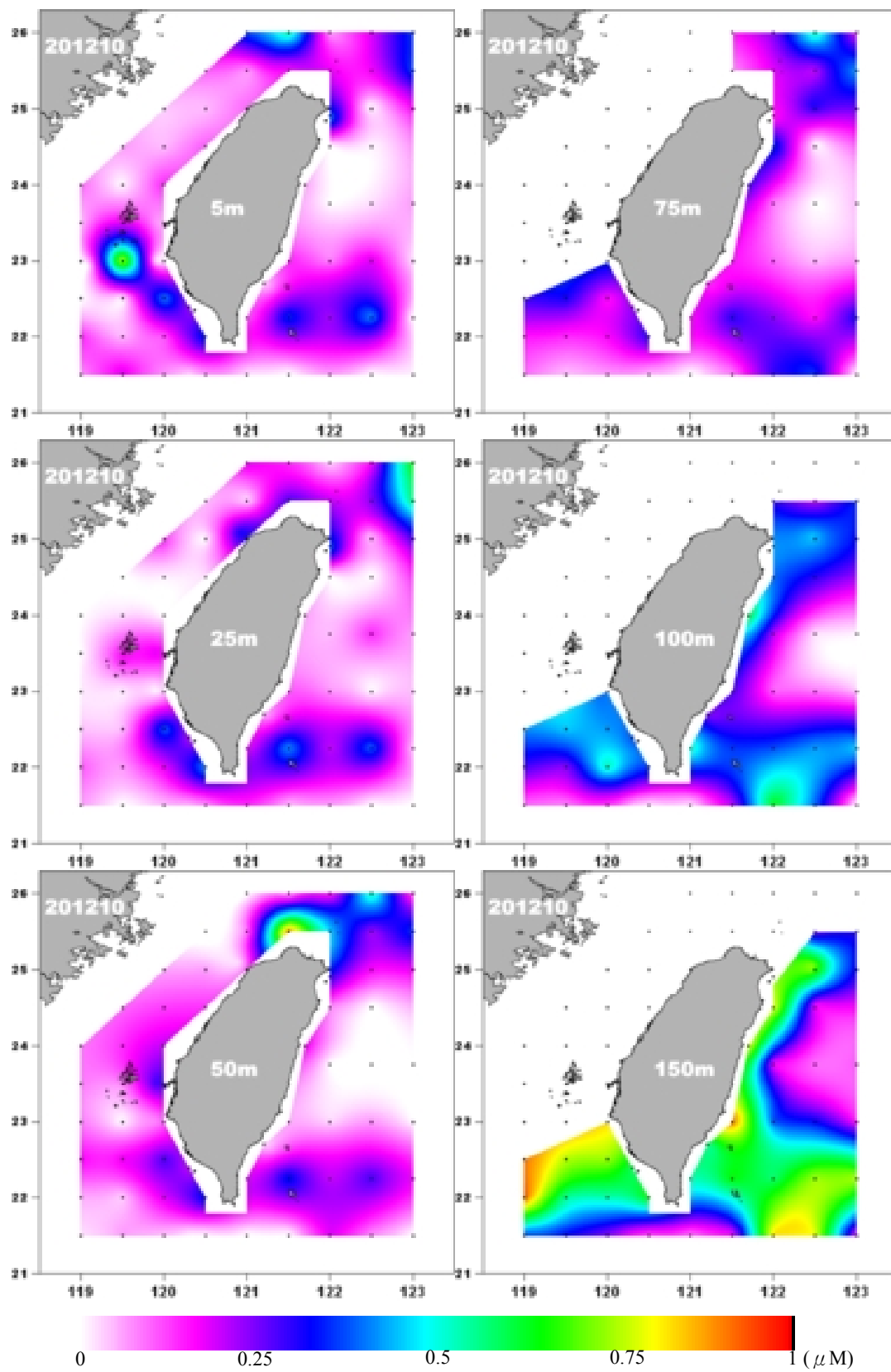


圖 20. 2012-10 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 20. Phosphate (PO_4^{3-}) distribution in Oct. 2012.

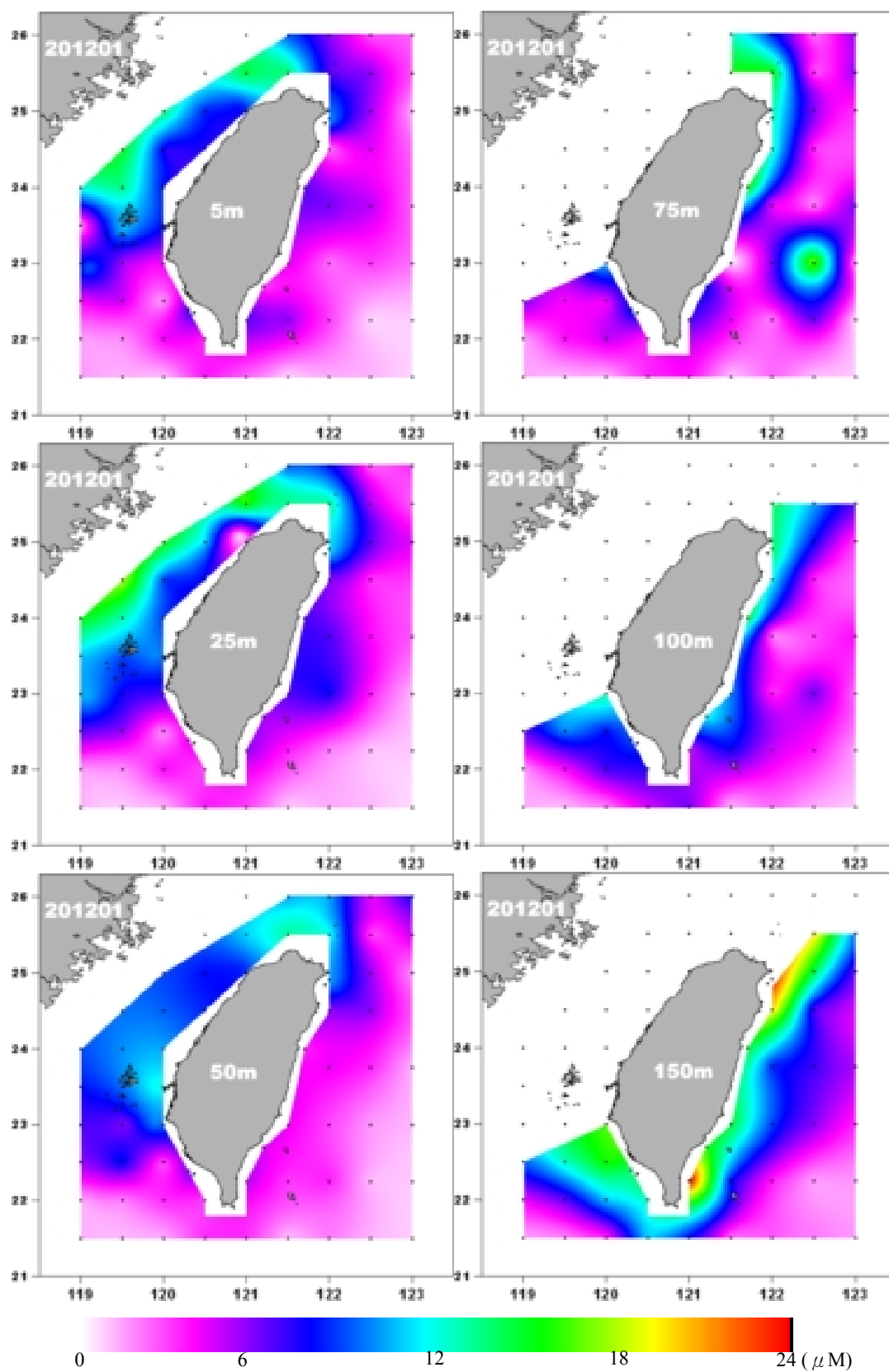


圖 21. 2012-01 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 21. Silicate (SiO_2^{2-}) distribution in Jan. 2012.

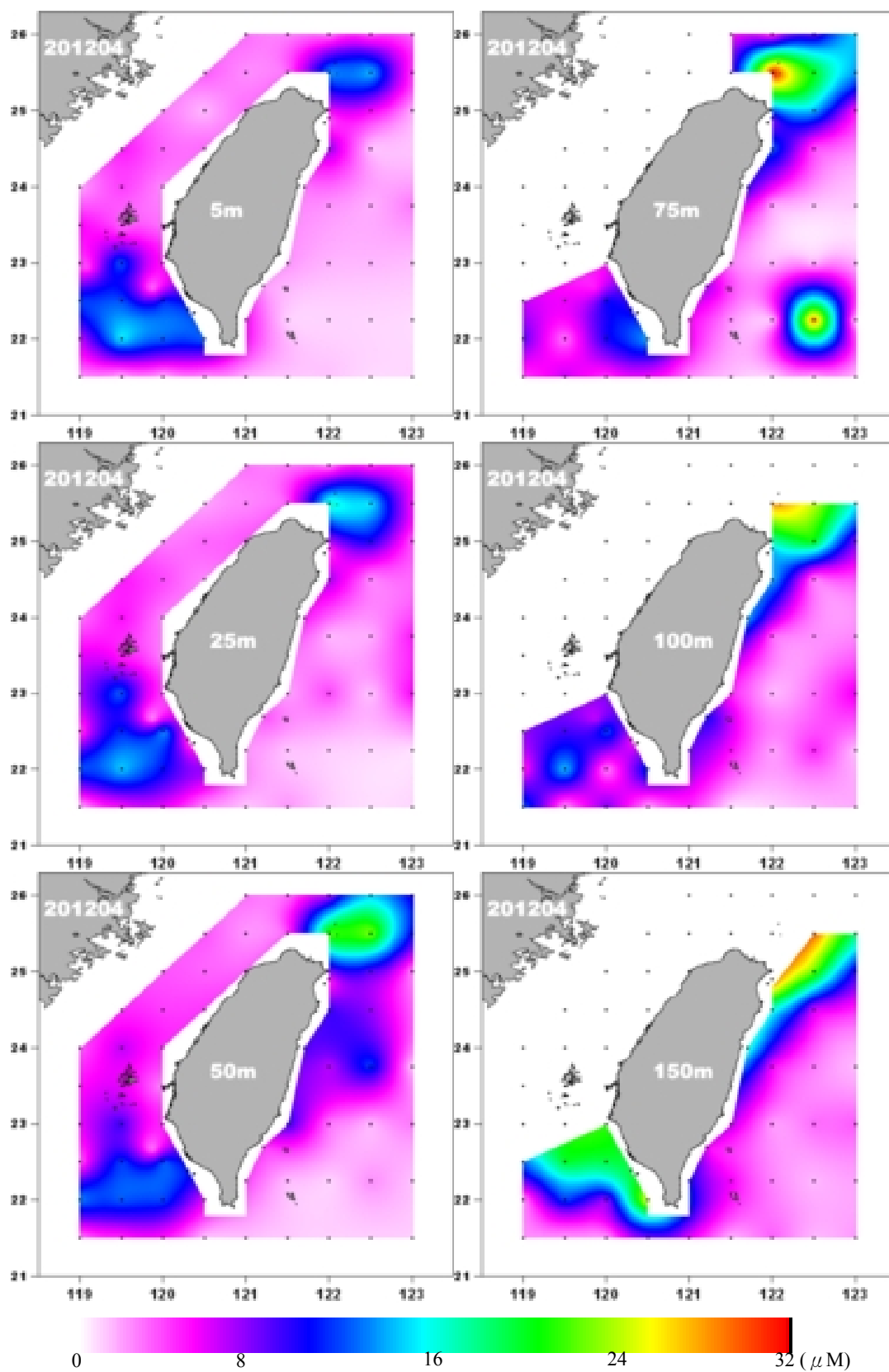


圖 22. 2012-04 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 22. Silicate (SiO_2^{2-}) distribution in Apr. 2012.

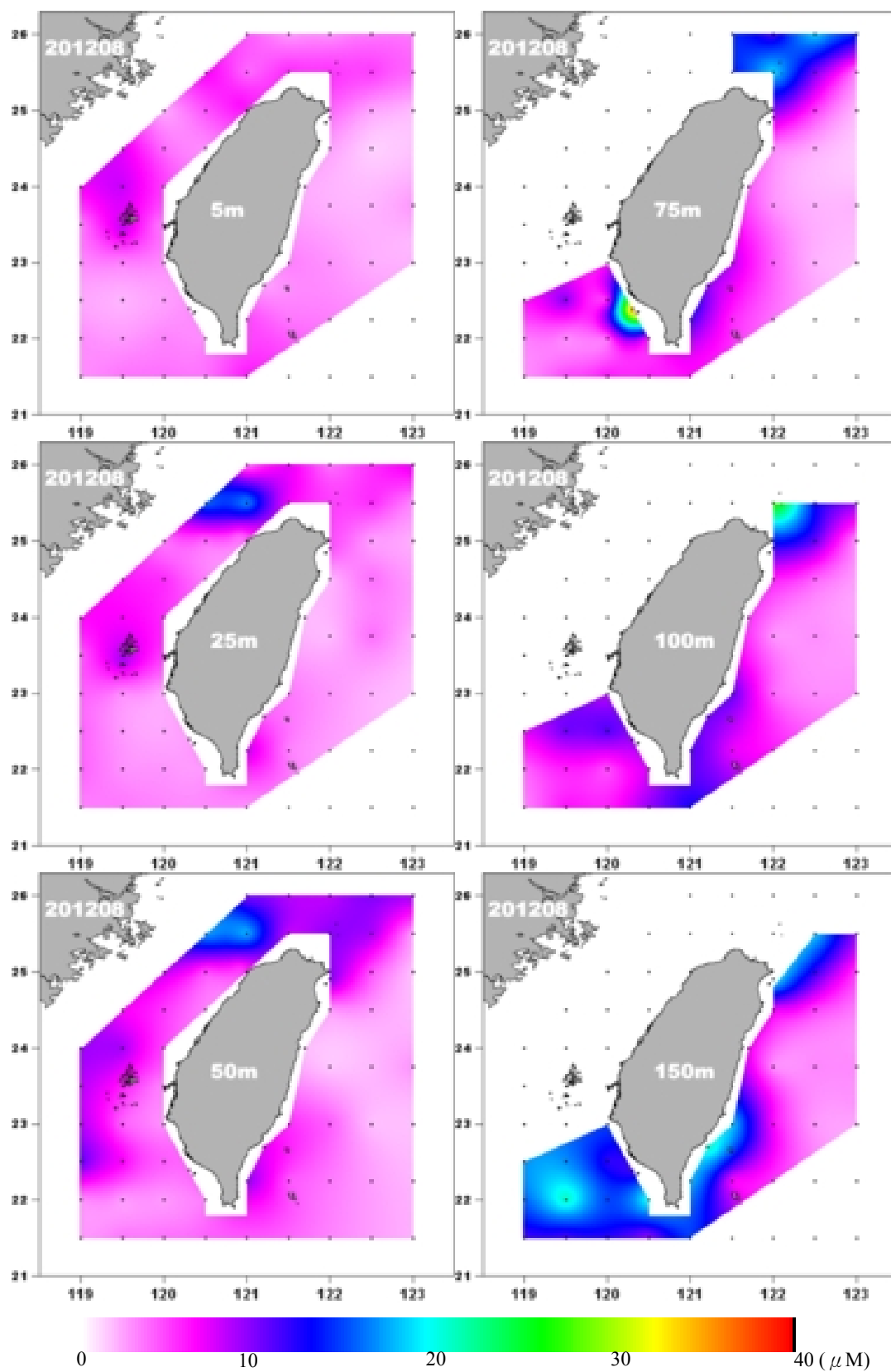


圖 23. 2012-08 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 23. Silicate (SiO_2^{2-}) distribution in Aug. 2012.

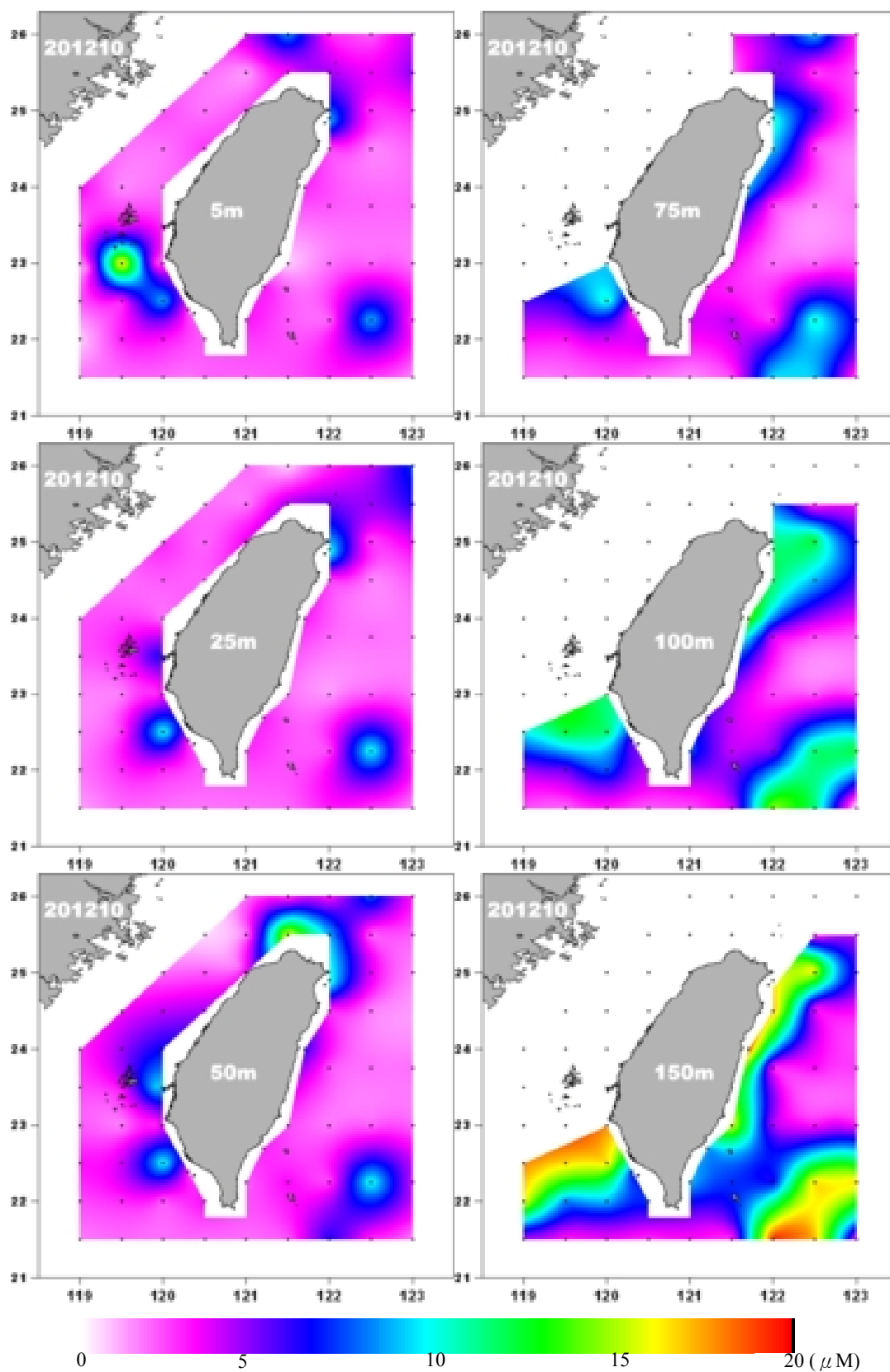


圖 24. 2012-10 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 24. Silicate (SiO_2^{2-}) distribution in Oct. 2012.

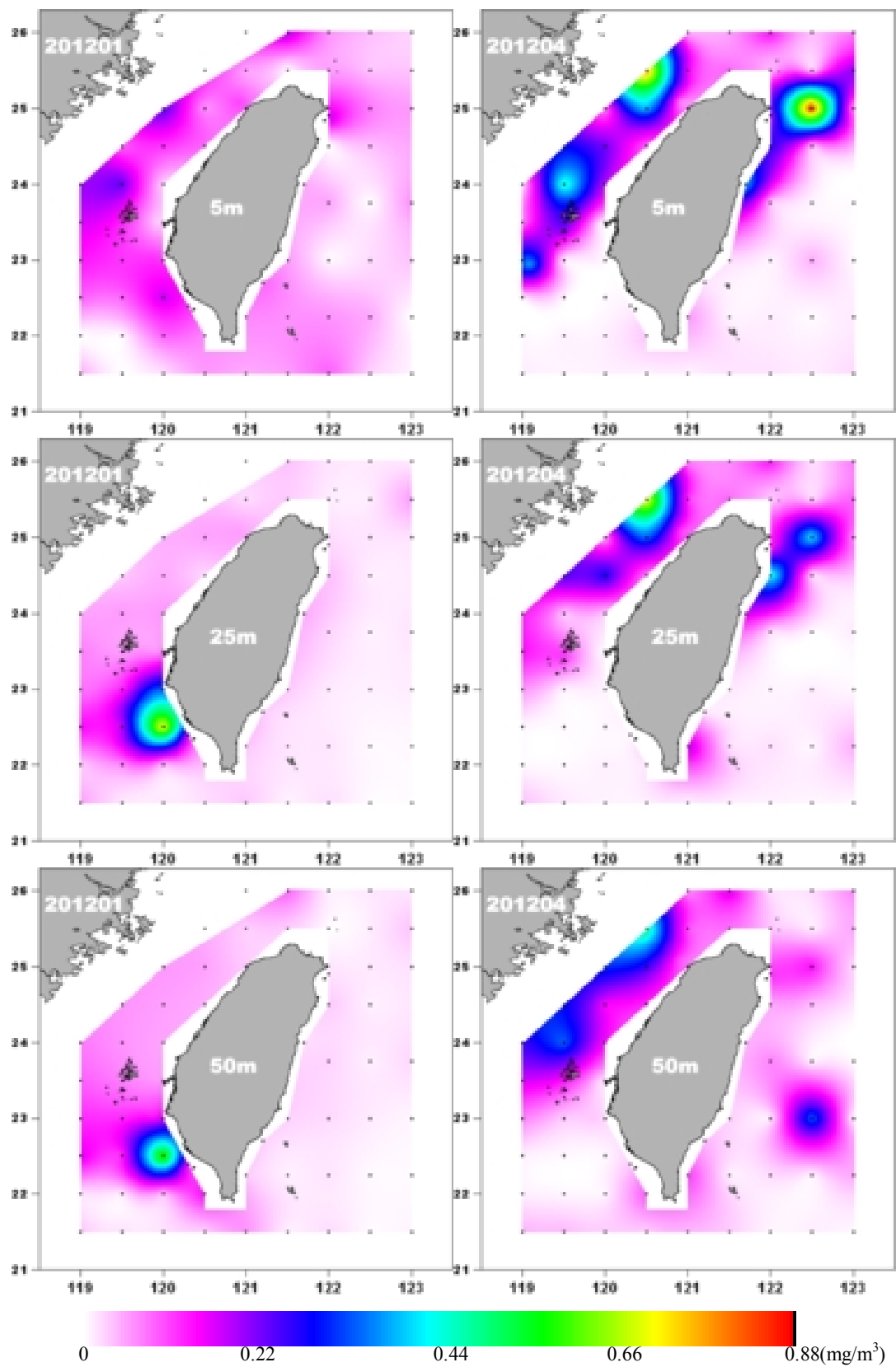


圖 25. 2012 年 1 月及 4 月葉綠素甲(chl-*a*)分布
 Fig. 25. Chlorophyll-*a* (chl-*a*) distribution in Jan. and Apr. 2012.

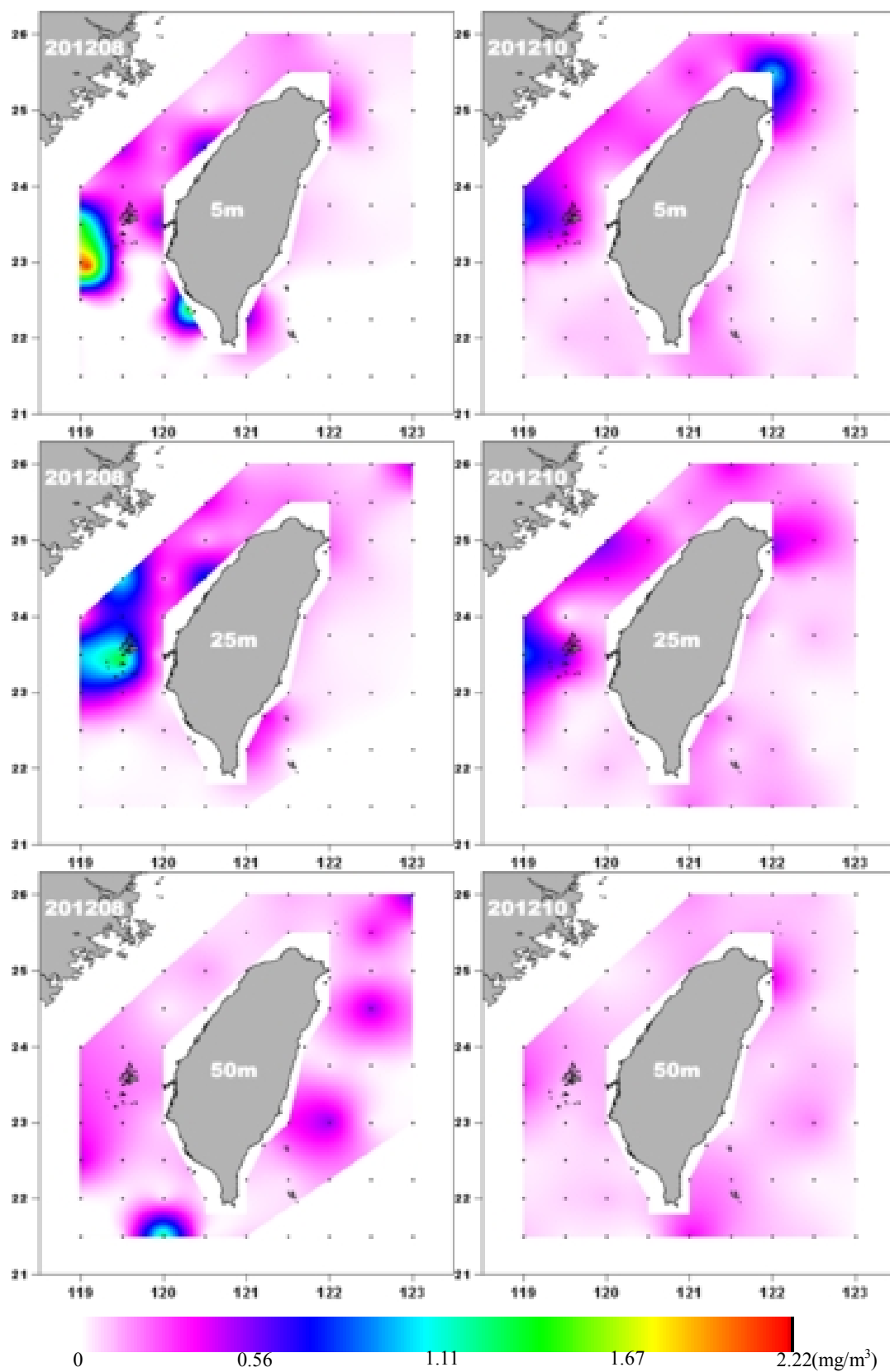


圖 26. 2012 年 8 月及 10 月葉綠素甲(chl-*a*)分布
 Fig. 26. Chlorophyll-*a* (chl-*a*) distribution in Aug. and Oct. 2012.

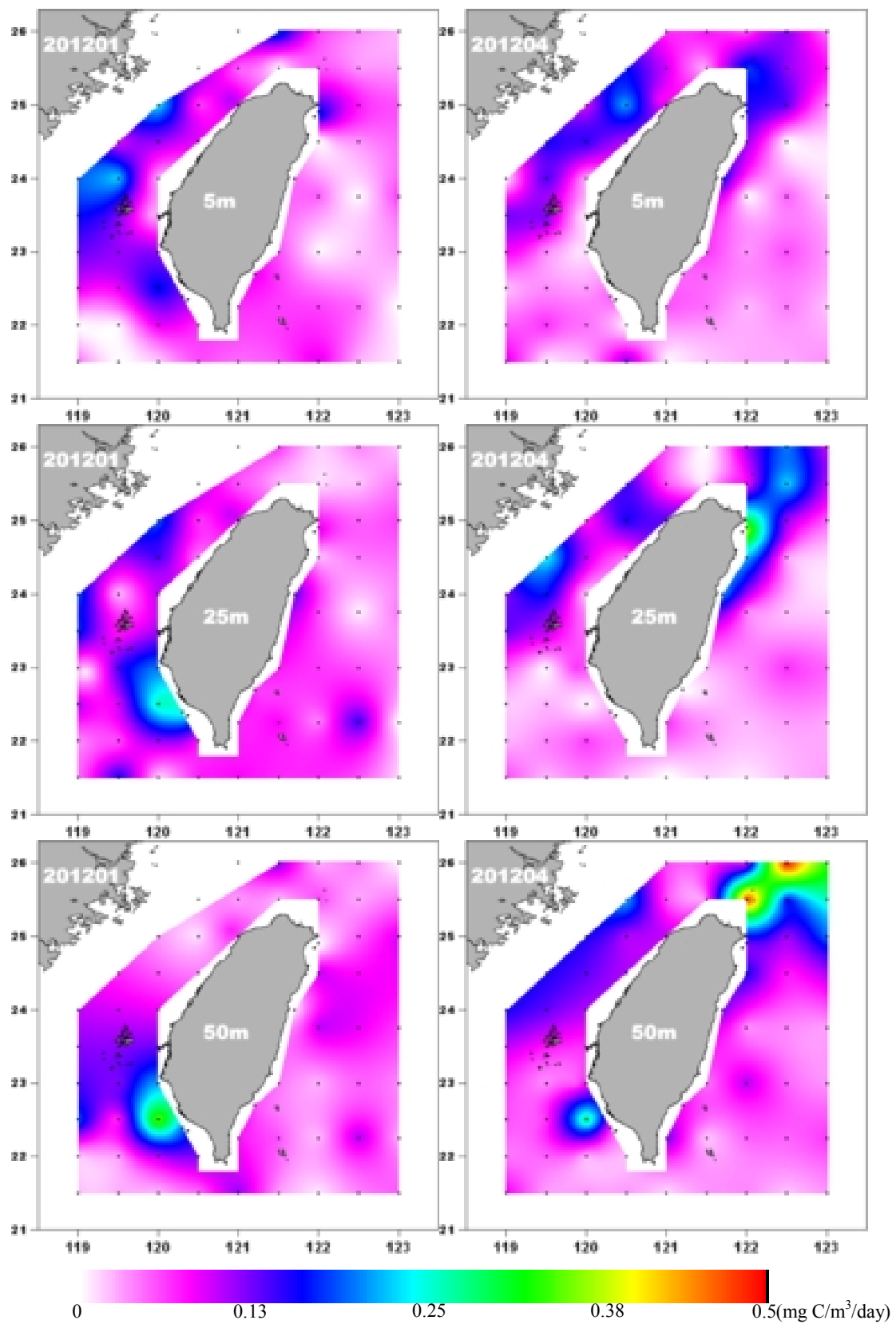


圖 27. 2012 年 1 月及 4 月基礎生產力分布
Fig. 27. Primary production distribution in Jan. and Apr. 2012.

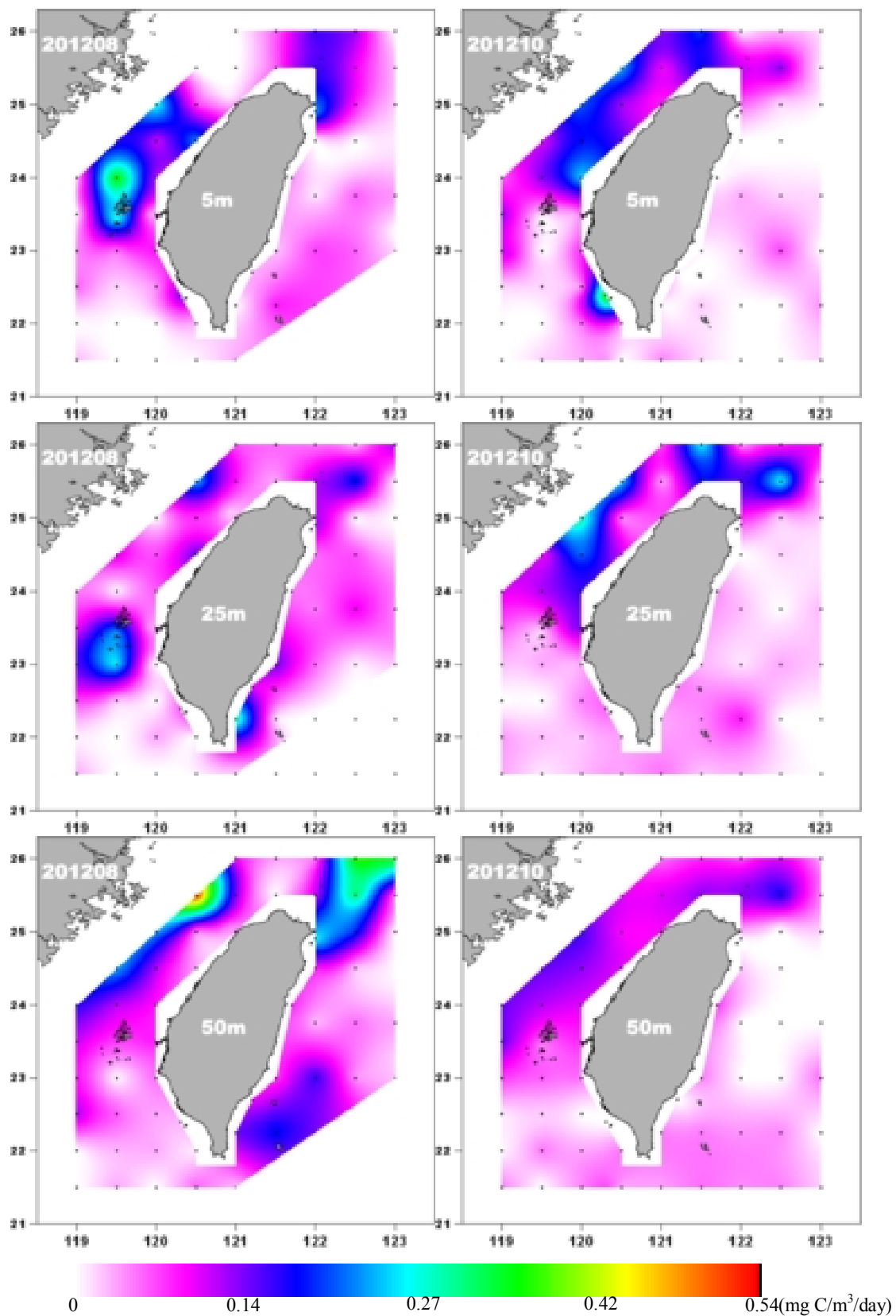


圖 28. 2012 年 8 月及 10 月基礎生產力分布
 Fig. 28. Primary production distribution in Aug. and Oct. 2012.

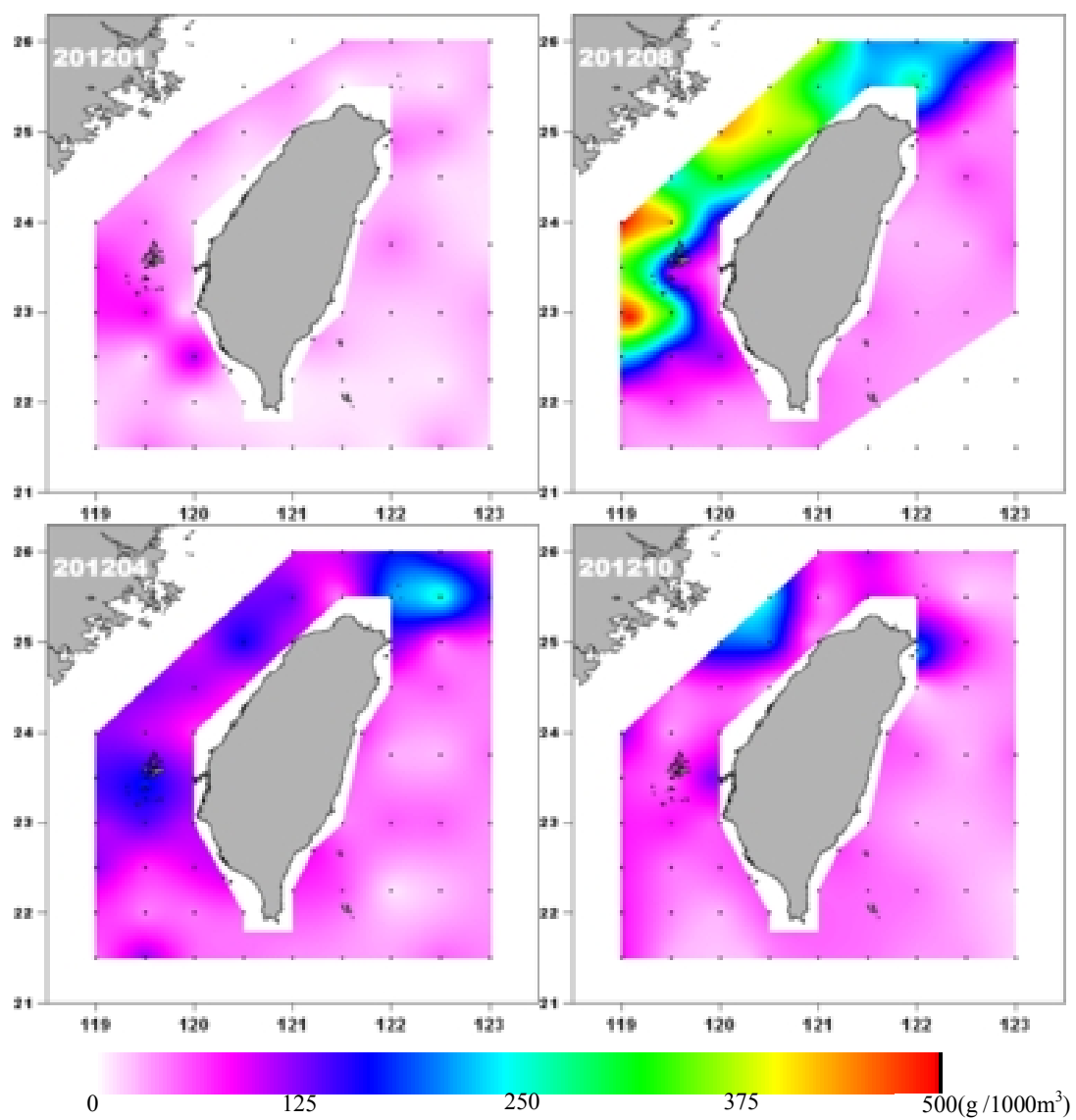


圖 29. 2012 年 1 月、4 月、8 月及 10 月浮游動物生物量分布

Fig. 29. Biomass of zooplankton sample in 2012.

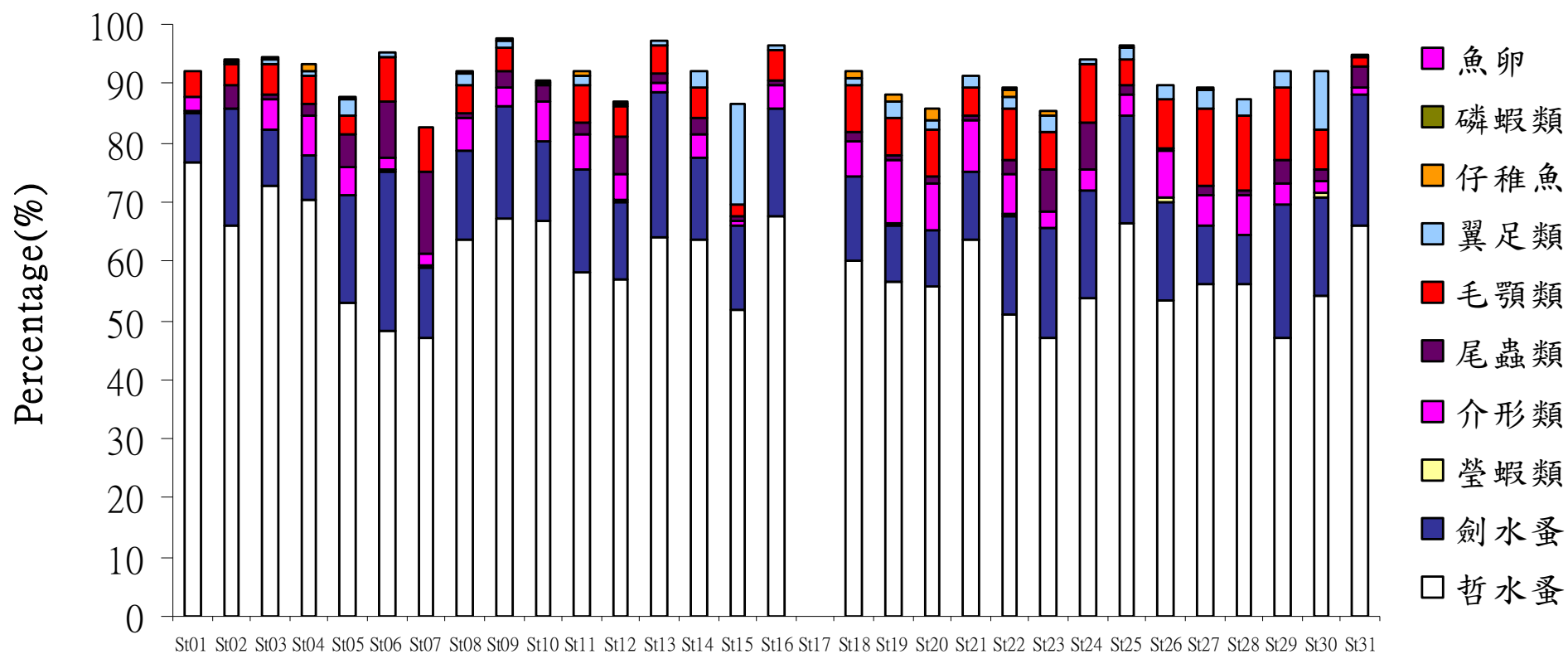


圖 30. 2012-01 航次浮游動物優勢大類出現百分率

Fig. 30. Percentage of the composition of zooplankton in Jan. 2012.

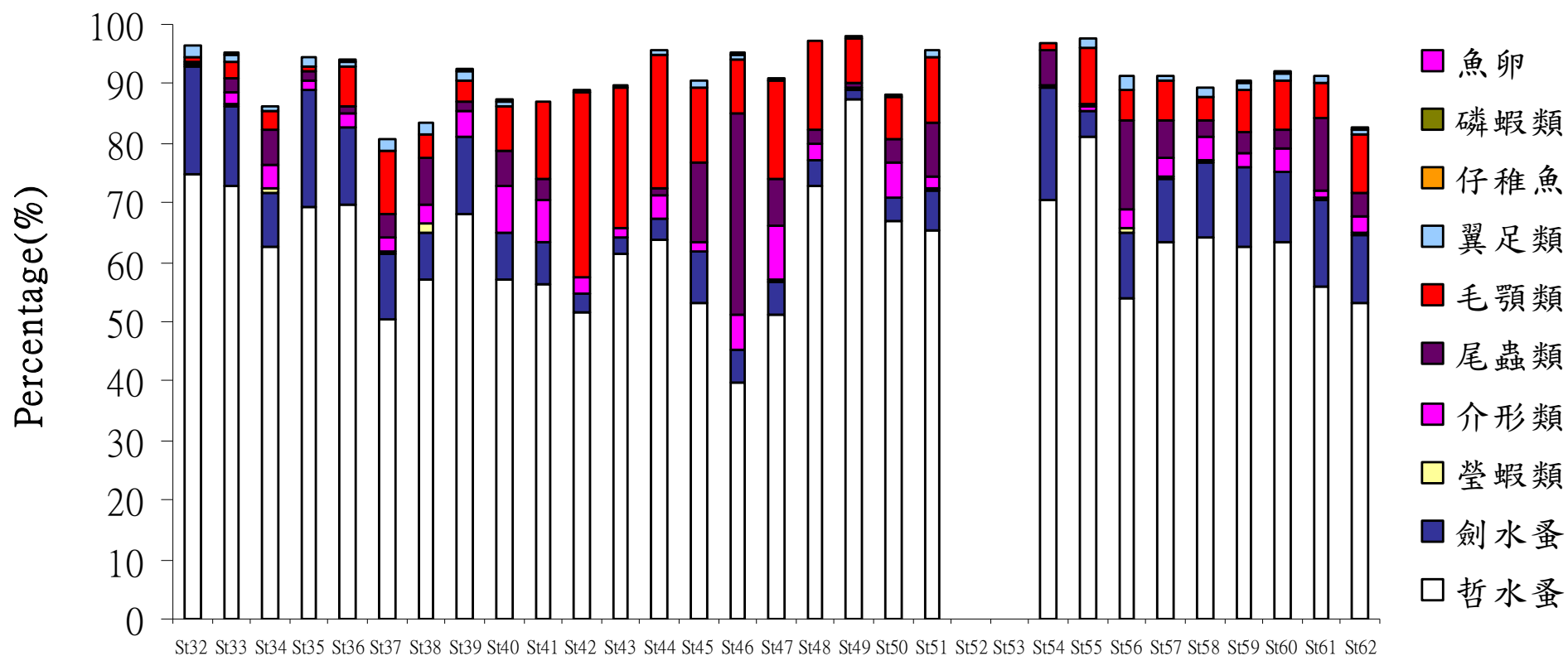


圖 31. 2012-01 航次浮游動物優勢大類出現百分率(續)

Fig. 31. Percentage of the composition of zooplankton in Jan. 2012.

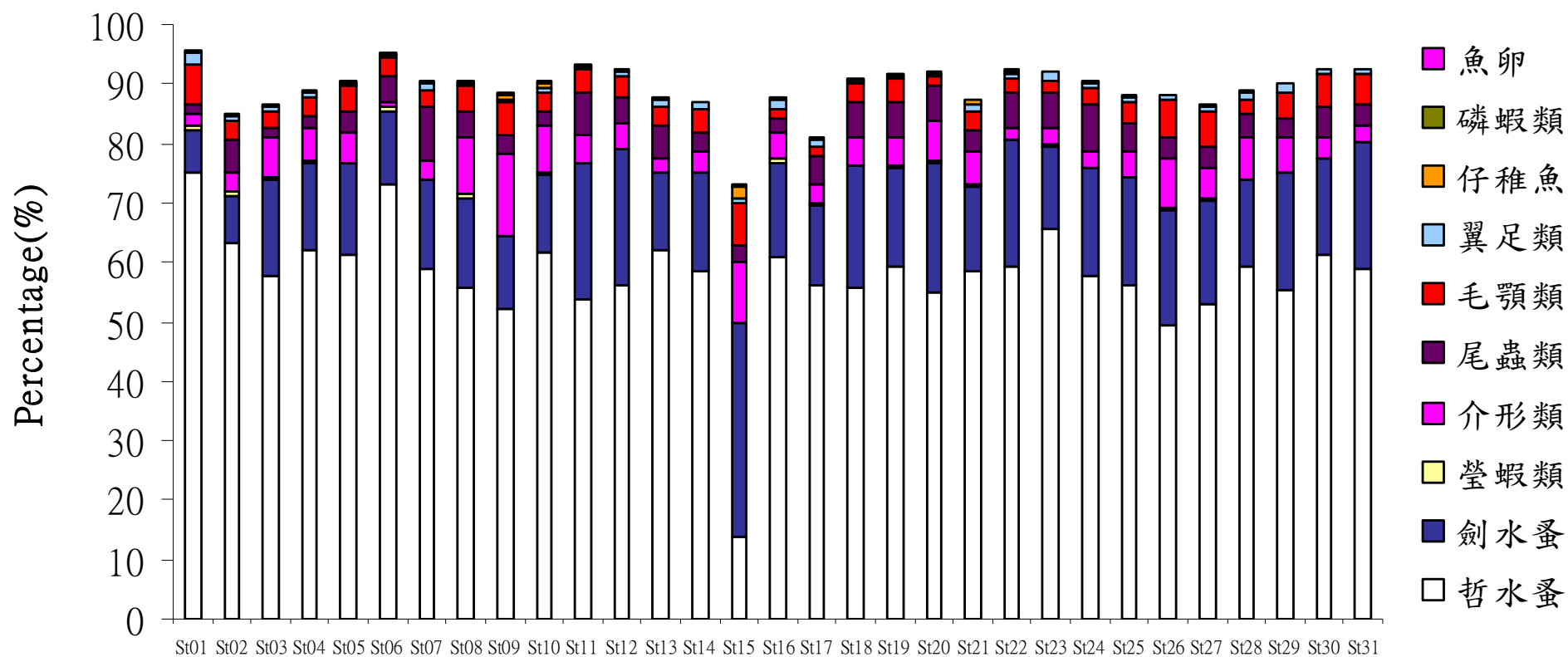


圖 32. 2012-04 航次浮游動物優勢大類出現百分率

Fig. 32. Percentage of the composition of zooplankton in Apr. 2012.

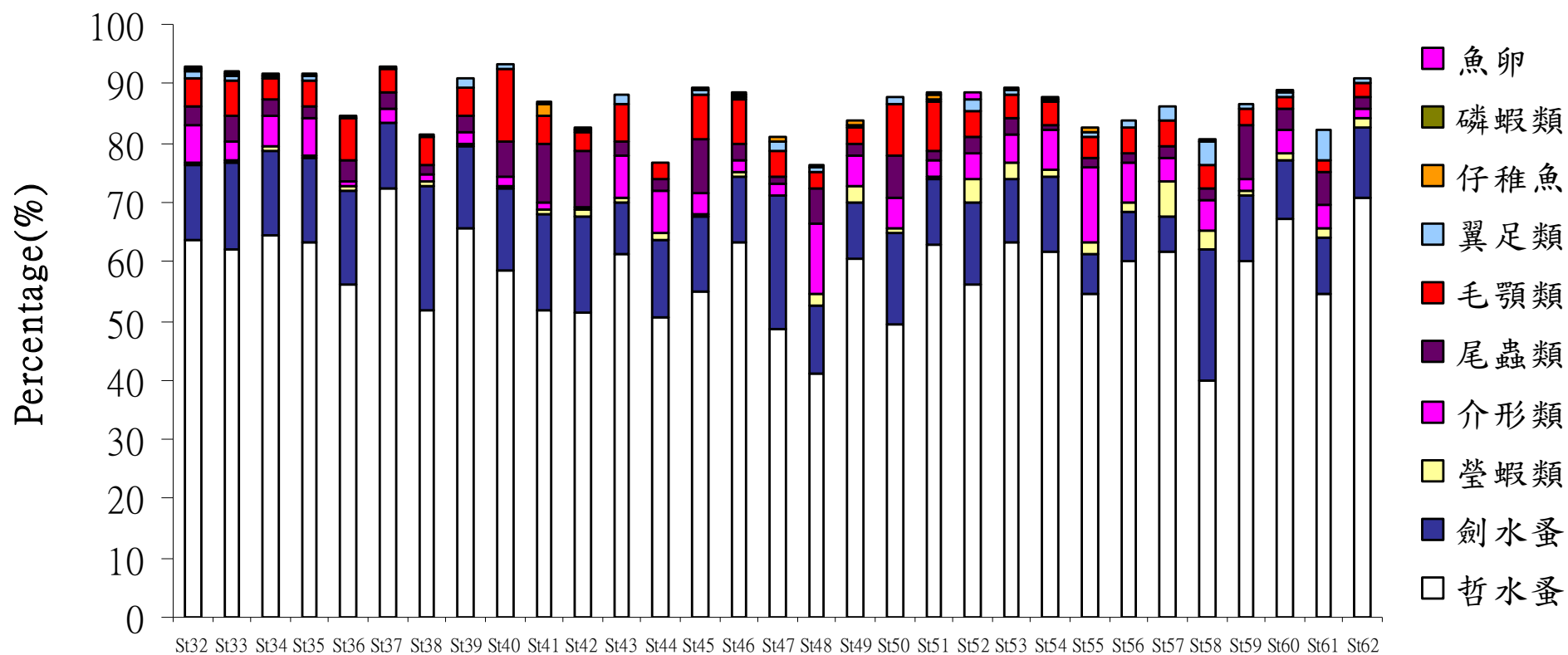


圖 33. 2012-04 航次浮游動物優勢大類出現百分率(續)

Fig. 33. Percentage of the composition of zooplankton in Apr. 2012.

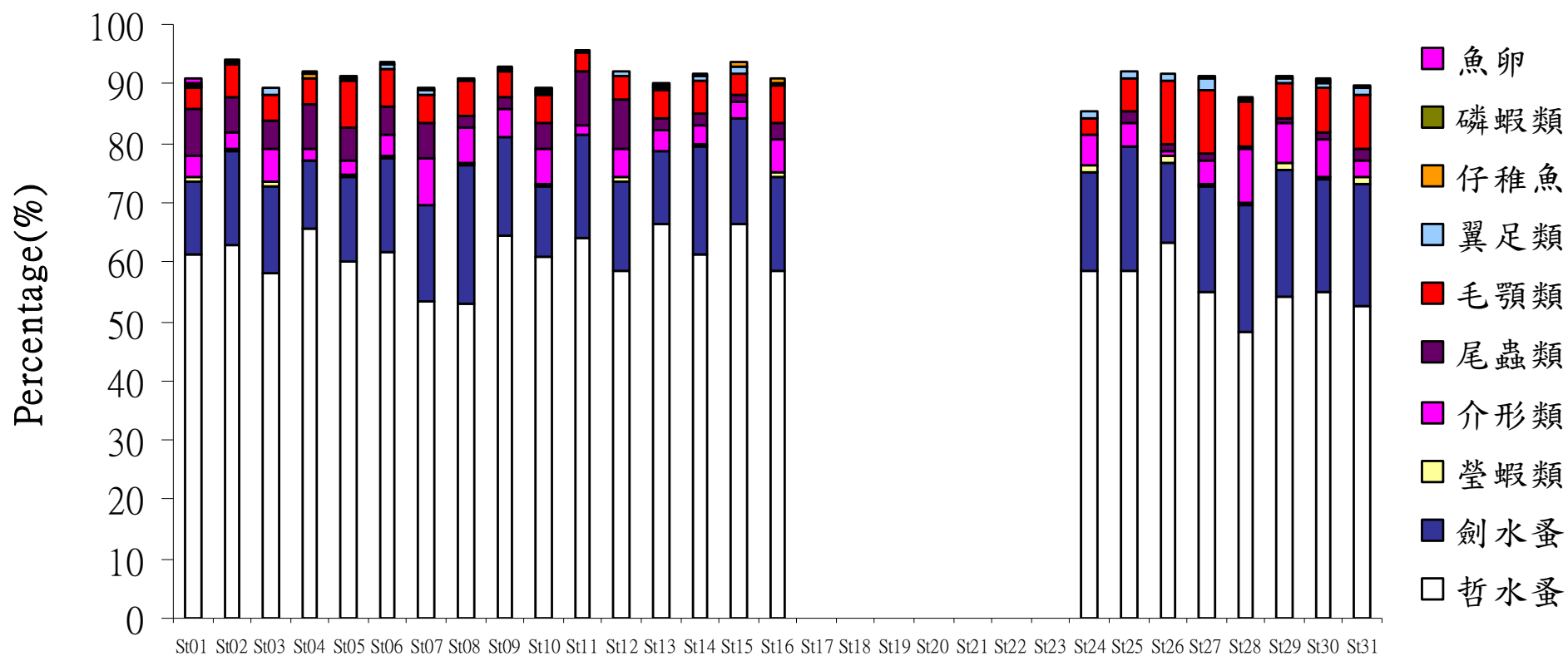


圖 34. 2012-08 航次浮游動物優勢大類出現百分率

Fig. 34. Percentage of the composition of zooplankton in Aug. 2012.

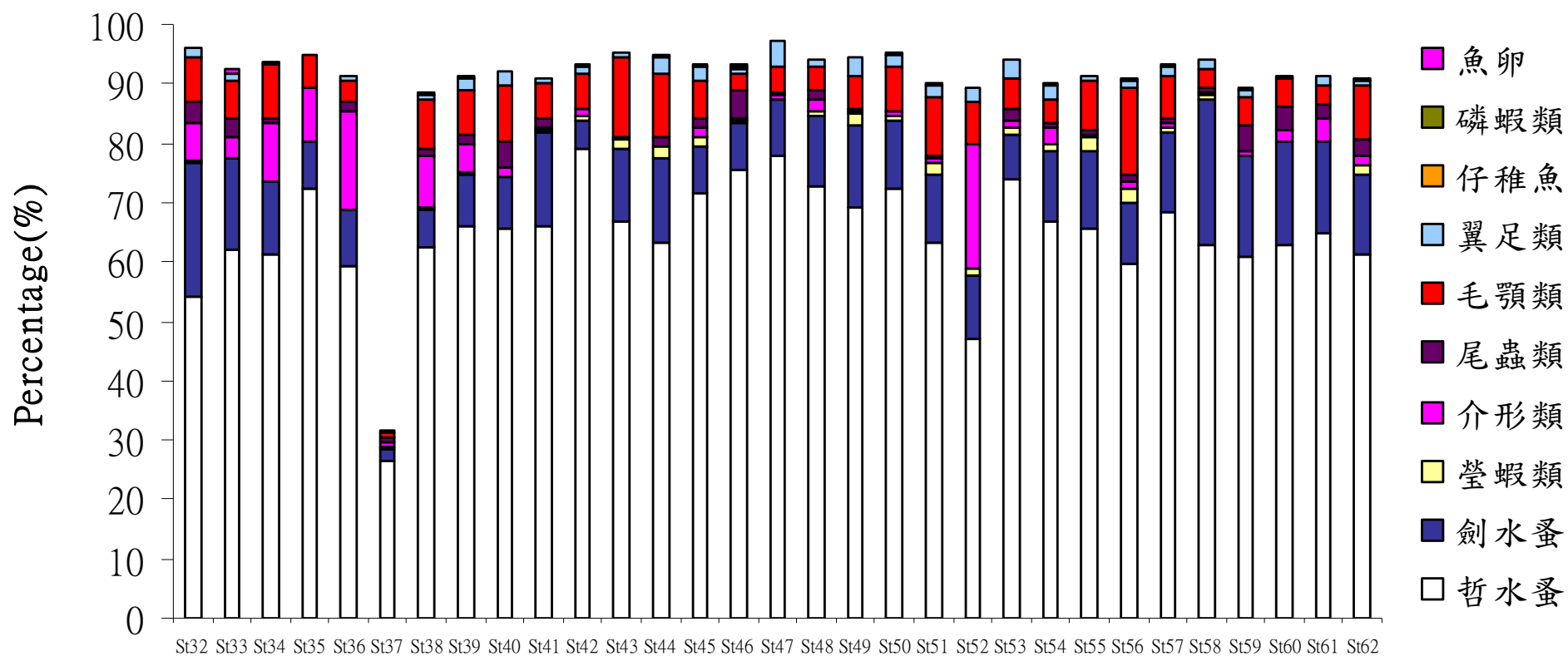


圖 35. 2012-08 航次浮游動物優勢大類出現百分率(續)

Fig. 35. Percentage of the composition of zooplankton in Aug. 2012.

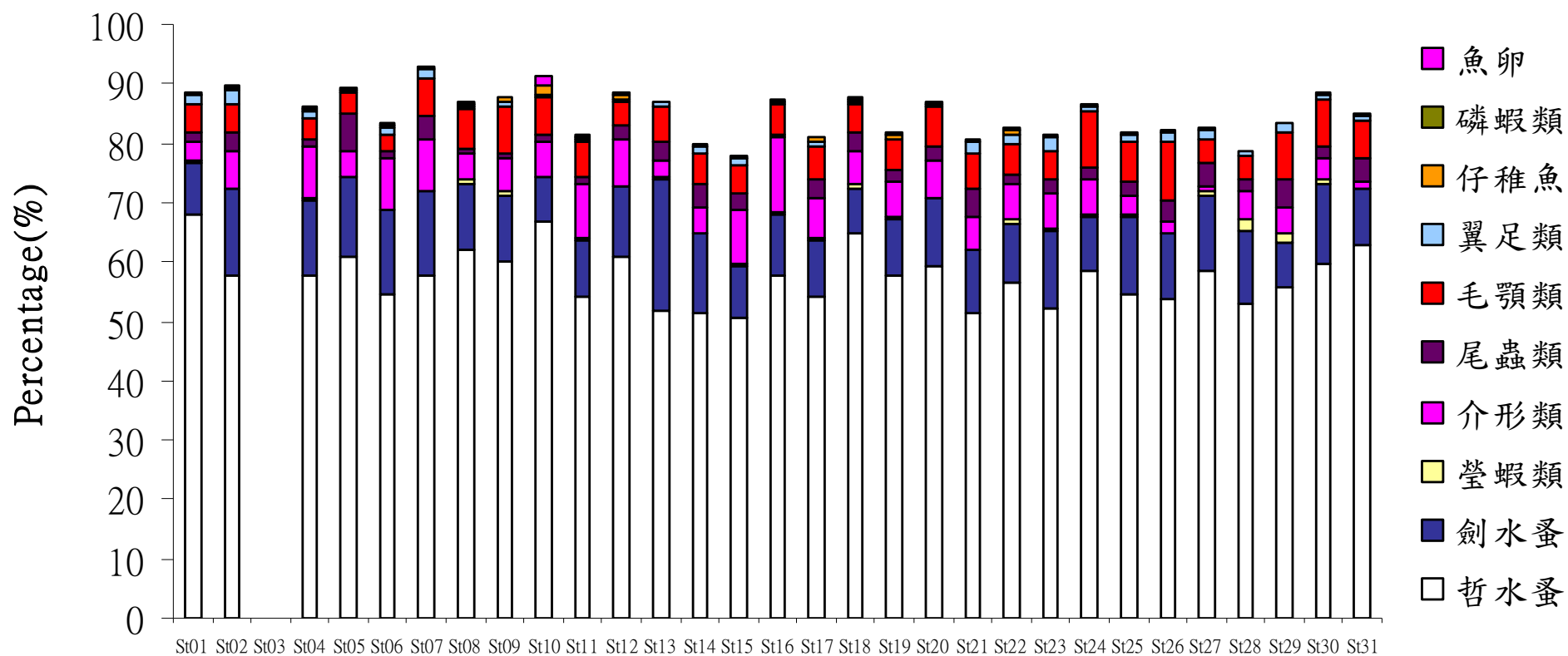


圖 36. 2012-10 航次浮游動物優勢大類出現百分率

Fig. 36. Percentage of the composition of zooplankton in Oct. 2012.

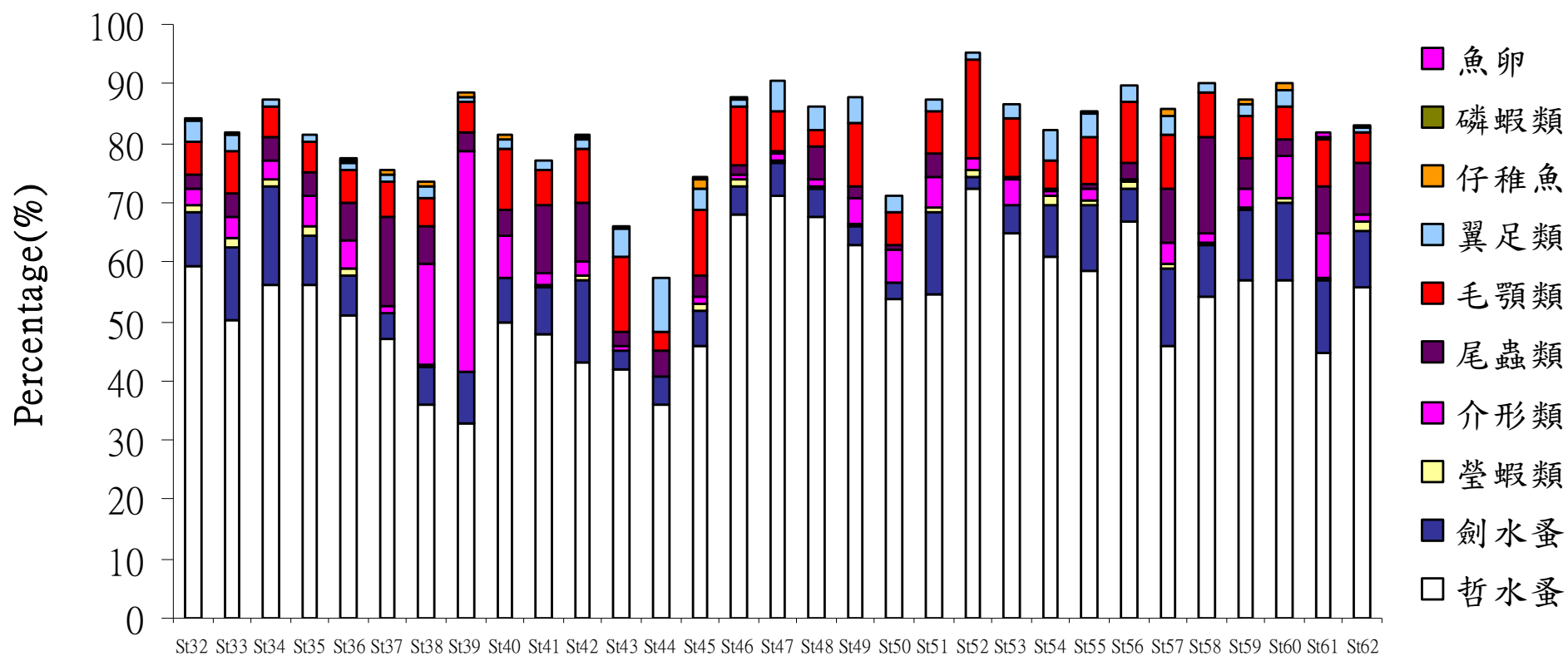


圖 37. 2012-10 航次浮游動物優勢大類出現百分率(續)

Fig. 37. Percentage of the composition of zooplankton in Oct. 2012.

表 01. 2011-12-28 航次基礎觀測資料
Chart 01. Basic observation data in Jan. 2012

Station	Date	SMT	Lati.	Long.	Depth	SST	Air T.	Air P.	Wind D.	Wind F.	O.N.D	Fl. Ct.	V.M.S.
St.01	20111228	1656	24.87	122.01	373	21.2	19.9	1019.15	336	4.1	200	1319	791.4
St.02	20111228	2100	25.02	122.51	1427	22.9	20.8	1019.60	314	5.9	200	1319	791.4
St.03	20111229	0020	25.00	123.00	1635	23.7	21.2	1018.08	241	4.4	200	1088	652.8
St.04	20111229	0518	24.52	122.50	592	23.7	19.7	1017.37	024	11.0	200	1311	786.6
St.05	20111229	0902	24.52	122.02	698	23.4	19.6	1020.75	358	10.0	200	1044	626.4
St.06	20111229	1414	24.03	121.68	120	24.4	20.5	1016.83	039	12.2	140	747	448.2
St.07	20111229	1753	23.77	122.00	2928	23.8	20.1	1018.61	006	12.1	200	175	105.0
St.08	20111229	2144	23.76	122.50	3264	24.2	21.7	1018.43	045	9.6	200	1033	619.8
St.09	20111230	0120	23.76	123.00	3651	24.2	21.2	1017.54	046	11.7	200	914	548.4
St.10	20111230	0649	23.01	123.01	5776	24.1	21.3	1018.43	052	10.3	200	1023	613.8
St.11	20111230	1017	23.01	122.50	5511	23.9	19.7	1019.86	021	15.9	200	1092	655.2
St.12	20111230	1402	23.02	122.00	4866	24.0	20.6	1017.90	015	13.4	200	1146	687.6
St.13	20111230	1820	23.03	121.52	1728	23.4	18.9	1021.82	013	14.7	200	917	550.2
St.14	20111230	2158	22.68	121.25	1052	23.9	19.6	1020.75	025	15.2	200	1033	619.8
St.15	20111231	0153	22.26	121.00	1170	23.9	19.3	1019.50	017	13.1	200	1300	780.0
St.16	20111231	0611	22.26	121.50	420	23.8	19.6	1020.04	031	9.9	200	1007	604.2
St.17	20111231	0958	22.27	122.00	4568	24.0	20.3	1019.50	022	9.3	200	1151	690.6
St.18	20111231	1352	22.26	122.50	4842	24.3	20.2	1016.83	020	11.1	200	1224	734.4
St.19	20111231	1743	22.26	122.99	3298	24.0	20.2	1017.01	022	11.6	200	805	483.0
St.20	20111231	2258	21.51	123.00	3146	24.6	21.0	1016.30	026	11.5	200	874	524.4
St.21	20120101	0233	21.51	122.51	1476	24.3	20.9	1015.23	045	11.1	200	1065	639.0
St.22	20120101	0600	21.51	122.00	3438	24.3	21.4	1016.65	035	11.9	200	758	454.8
St.23	20120101	0930	21.52	121.50	1955	24.5	20.7	1017.22	036	14.5	200	1544	926.4
St.24	20120101	1301	21.50	121.00	1186	24.4	21.1	1015.05	044	12.4	200	954	572.4
St.25	20120101	1636	21.51	120.50	1795	24.1	21.2	1015.59	053	13.1	200	958	574.8
St.26	20120101	2017	21.49	120.01	2924	24.3	20.9	1017.54	060	11.7	200	781	468.6
St.27	20120102	0028	21.50	119.52	2969	24.0	19.2	1017.01	036	4.5	200	733	439.8
St.28	20120102	0452	21.51	119.01	2772	23.7	18.2	1017.19	011	12.7	200	1135	681.0
St.29	20120102	0915	22.00	119.01	1577	23.6	19.0	1019.32	031	9.3	200	1041	624.6
St.30	20120102	1224	22.01	119.50	2399	23.8	18.4	1016.83	009	8.0	200	1217	730.2
St.31	20120102	1536	22.01	120.01	1222	23.3	18.7	1015.94	355	6.8	200	1170	702.0
St.32	20120102	1846	22.01	120.51	417	23.8	19.9	1016.83	077	10.9	200	963	577.8
St.33	20120102	2128	22.36	120.32	358	23.3	19.6	1017.19	085	1.4	200	1055	633.0
St.34	20120102	2340	22.49	120.00	579	22.6	18.8	1017.00	333	5.8	200	789	473.4
St.35	20120103	0256	22.52	119.50	218	22.0	18.0	1016.65	026	9.2	200	1233	739.8
St.36	20120103	0608	22.48	119.01	88	21.7	17.4	1017.37	014	9.2	80	366	219.6
St.37	20120103	0932	22.94	119.10	28	20.1	16.2	1018.97	022	9.4	20	152	91.2
St.38	20120103	1200	23.00	119.54	75	20.7	16.9	1015.94	019	12.0	72	323	193.8
St.39	20120103	1437	23.01	119.89	170	21.1	17.4	1015.23	007	12.7	180	1085	651.0
St.40	20120103	1749	23.50	119.92	117	20.2	17.7	1016.30	017	13.6	105	417	250.2
St.41	20120103	2027	23.44	119.51	55	19.5	16.2	1018.61	022	12.5	43	262	157.2
St.42	20120105	1543	23.50	119.00	51	16.9	12.1	1018.08	025	15.5	40	146	87.6
St.43	20120105	2236	24.00	119.00	60	15.8	10.1	1019.32	023	14.7	55	420	252.0
St.44	20120106	0156	24.01	119.50	61	16.1	12.8	1018.61	015	13.4	55	260	156.0
St.45	20120106	0505	24.01	120.00	40	17.4	15.0	1018.43	010	13.2	30	163	97.8
St.46	20120106	1010	24.50	120.49	54	18.4	15.9	1019.86	012	13.1	48	395	237.0
St.47	20120106	1255	24.50	120.02	61	17.4	13.6	1018.97	013	13.9	55	611	366.6
St.48	20120106	1558	24.50	119.51	62	16.0	12.2	1020.57	025	13.7	55	308	184.8
St.49	20120106	2154	25.00	119.99	57	16.0	12.9	1022.53	016	16.0	50	210	126.0
St.50	20120107	0110	25.01	120.50	73	17.9	16.0	1022.53	035	16.4	70	532	319.2
St.51	20120107	0423	25.09	120.91	73	18.2	15.2	1022.35	042	16.9	60	337	202.2
St.52	-	-	-	-	-	-	-	-	-	-	-	-	-
St.53	-	-	-	-	-	-	-	-	-	-	-	-	-
St.54	20120107	0906	25.50	120.99	93	17.8	14.7	1025.55	041	14.3	89	335	201.0
St.55	20120107	1245	25.51	121.51	112	18.3	15.5	1023.77	035	13.3	110	1086	651.6
St.56	20120107	1630	26.00	121.48	66	18.8	15.5	1024.31	035	13.3	60	255	153.0
St.57	20120107	2021	26.01	121.99	101	20.5	16.1	1024.31	052	12.9	90	426	255.6
St.58	20120108	0000	26.00	122.50	106	21.3	17.7	1023.24	046	13.1	97	521	312.6
St.59	20120108	0340	26.01	122.99	96	21.8	18.1	1021.99	047	14.0	90	528	316.8
St.60	20120108	0714	25.51	123.00	770	22.8	20.3	1020.75	051	10.0	200	772	463.2
St.61	20120108	1013	25.51	122.50	328	22.8	18.9	1021.99	032	11.0	200	887	532.2
St.62	20120108	1309	25.51	122.00	116	22.2	18.1	1019.86	026	13.4	100	480	288.0

表 02. 2012-04-16 航次基礎觀測資料
Chart 02. Basic observation data in Apr. 2012

Station	Date	SMT	Lat.	Long.	Depth	SST	Air T.	Air P.	Wind D.	Wind F.	O.N.D	Fl. Ct.	V.M.S.
St.01	20120416	1210	24.87	121.99	280	24.6	21.1	1009.18	014	10.0	200	904	542.4
St.02	20120416	1606	25.00	122.49	1443	23.9	19.8	1009.18	022	9.3	200	1145	687.0
St.03	20120416	1930	25.02	123.01	1606	25.4	22.3	1010.25	026	8.7	200	820	492.0
St.04	20120417	0224	24.51	122.50	598	26.4	22.3	1009.18	017	7.2	200	798	478.8
St.05	20120417	0613	24.51	122.01	767	25.9	20.9	1010.78	012	7.7	200	1363	817.8
St.06	20120417	1025	24.00	121.68	310	26.3	22.5	1012.03	018	3.0	200	912	547.2
St.07	20120417	1335	23.77	122.01	3029	26.7	22.9	1009.18	005	5.3	200	712	427.2
St.08	20120417	1810	23.76	122.50	3361	26.0	24.1	1009.89	039	4.4	200	947	568.2
St.09	20120417	2125	23.76	122.99	3641	25.6	23.6	1010.42	073	2.2	200	1007	604.2
St.10	20120418	0255	23.00	123.00	5330	26.1	23.9	1008.29	125	1.0	200	1321	792.6
St.11	20120418	0624	23.00	122.50	5526	25.6	24.0	1009.71	074	7.4	200	933	559.8
St.12	20120418	0953	23.01	122.00	4866	27.1	27.8	1010.07	265	3.4	200	899	539.4
St.13	20120418	1344	23.01	121.51	2031	27.4	25.4	1007.93	043	0.0	200	792	475.2
St.14	20120418	1747	22.67	121.26	1175	27.5	24.9	1008.29	052	2.8	200	949	569.4
St.15	20120418	2140	22.24	121.00	1132	27.1	24.7	1009.71	320	2.4	200	870	522.0
St.16	20120419	0120	22.25	121.49	700	27.6	25.4	1007.93	066	8.0	200	904	542.4
St.17	20120419	0432	22.25	122.02	4609	27.5	25.7	1007.58	193	5.0	200	1523	913.8
St.18	20120419	0801	22.24	122.50	4848	26.8	25.9	1009.36	179	4.0	200	1024	614.4
St.19	20120419	1147	22.24	123.00	3591	28.4	26.4	1008.47	187	6.4	200	875	525.0
St.20	20120420	1830	21.49	123.02	5100	28.3	26.7	1007.75	170	4.3	200	834	500.4
St.21	20120421	0031	21.49	122.51	4788	29.0	27.1	1007.75	199	6.7	200	898	538.8
St.22	20120421	0552	21.50	122.00	3462	29.0	27.2	1006.15	199	8.0	200	735	441.0
St.23	20120421	1040	21.49	121.51	2090	29.5	27.9	1006.51	219	6.7	200	861	516.6
St.24	20120422	1355	21.53	121.01	1083	29.5	26.1	1007.50	029	10.8	200	1063	637.8
St.25	20120422	1745	21.50	120.51	1809	29.0	25.8	1008.29	063	11.0	200	1086	651.6
St.26	20120422	2117	21.50	120.01	2942	29.1	26.0	1009.53	080	10.7	200	1230	738.0
St.27	20120423	0048	21.50	119.50	2992	29.2	26.6	1008.47	106	9.6	200	749	449.4
St.28	20120423	0421	21.50	119.01	2787	28.3	26.4	1007.93	113	8.4	200	846	507.6
St.29	20120423	0750	22.01	119.00	1368	28.4	26.4	1009.71	127	8.0	200	851	510.6
St.30	20120423	1143	22.00	119.50	2340	28.2	26.9	1009.89	114	11.7	200	1039	623.4
St.31	20120423	1520	22.00	120.00	1125	28.3	27.1	1007.04	110	6.4	200	875	525.0
St.32	20120423	1847	22.00	120.51	384	28.4	27.3	1008.29	104	5.8	200	986	591.6
St.33	20120423	2139	22.37	120.35	127	28.6	27.7	1008.29	140	6.4	120	642	385.2
St.34	20120424	0009	22.50	120.01	594	28.6	27.5	1008.47	185	5.0	200	1097	658.2
St.35	20120424	0406	22.50	119.51	237	28.3	27.0	1006.86	185	6.1	200	764	458.4
St.36	20120424	0756	22.50	118.92	87	27.6	27.5	1007.58	169	7.5	80	440	264.0
St.37	20120424	1028	22.94	119.09	25	26.2	27.5	1007.75	117	2.2	22	95	57.0
St.38	20120424	1236	23.00	119.49	78	27.4	27.5	1005.97	149	9.4	72	391	234.6
St.39	20120424	1455	22.99	119.87	126	28.6	27.7	1005.62	178	7.2	120	493	295.8
St.40	20120424	1800	23.49	119.95	110	28.8	28.3	1005.97	199	2.6	110	546	327.6
St.41	20120424	2046	23.44	119.51	50	26.1	25.9	1007.22	212	8.8	48	214	128.4
St.42	20120424	2331	23.50	119.00	53	25.6	25.4	1006.33	214	9.5	40	189	113.4
St.43	20120425	0245	23.99	119.00	60	25.9	25.1	1004.91	195	5.5	53	283	169.8
St.44	20120425	0520	23.99	119.51	61	25.4	25.0	1005.08	186	9.4	55	196	117.6
St.45	20120425	0816	24.00	119.99	42	27.5	27.4	1006.51	155	11.6	35	179	107.4
St.46	20120425	1144	24.50	120.51	53	27.6	28.0	1005.44	216	10.5	50	263	157.8
St.47	20120425	1450	24.50	120.01	61	26.7	26.3	1003.84	222	12.6	55	281	168.6
St.48	20120425	1809	24.50	119.52	56	25.8	24.9	1004.91	210	9.1	55	388	232.8
St.49	20120425	2130	25.00	120.00	51	24.3	24.0	1007.58	282	1.0	45	281	168.6
St.50	20120426	0007	25.00	120.49	76	25.4	25.7	1005.97	167	6.4	70	288	172.8
St.51	20120426	0240	25.08	120.91	74	26.7	24.6	1006.69	328	7.6	65	424	254.4
St.52	20120426	1900	25.49	120.50	61	24.7	21.1	1009.18	053	13.9	55	254	152.4
St.53	20120426	2330	25.99	120.99	79	24.8	21.1	1011.96	087	12.7	75	382	229.2
St.54	20120427	0258	25.50	121.00	97	25.3	21.3	1008.64	089	10.4	80	329	197.4
St.55	20120427	0600	25.50	121.47	108	26.0	21.8	1008.47	092	16.1	100	373	223.8
St.56	20120427	0920	25.98	121.50	67	25.8	22.0	1010.25	073	10.1	61	189	113.4
St.57	20120427	1218	26.00	121.99	101	25.4	21.2	1010.78	140	13.1	95	461	276.6
St.58	20120427	1513	26.00	122.50	104	25.1	21.1	1009.71	147	8.4	100	395	237.0
St.59	20120427	1755	26.00	122.97	96	24.9	21.2	1009.71	120	10.0	90	379	227.4
St.60	20120427	2107	25.49	123.01	770	25.8	22.8	1011.14	153	5.7	200	1183	709.8
St.61	20120428	0048	25.50	122.51	444	25.5	23.1	1010.42	212	7.0	200	1003	601.8
St.62	20120428	0428	25.50	122.01	116	25.1	22.8	1008.82	192	7.4	110	462	277.2

表 03. 2012-08-17 航次基礎觀測資料
Chart 03. Basic observation data in Aug.2012

Station	Date	SMT	Lati.	Long.	Depth	SST	Air T.	Air P.	Wind D.	Wind F.	O.N.D	Fl. Ct.	V.M.S.
St..01	20120817	1310	24.86	122.00	457	29.9	28.0	1007.22	076	4.5	200	1862	1117.2
St..02	20120817	1743	25.01	122.51	1437	30.1	28.0	1007.40	049	3.7	200	1331	798.6
St..03	20120817	2105	25.00	123.00	1620	30.3	28.1	1008.64	108	2.8	200	874	524.4
St..04	20120818	0224	24.51	122.50	584	30.2	27.0	1007.75	349	7.6	200	830	498.0
St..05	20120818	0552	24.50	122.00	862	30.1	27.6	1008.11	356	4.5	200	864	518.4
St..06	20120818	1022	24.00	121.68	352	31.0	29.4	1008.82	062	1.7	200	745	447.0
St..07	20120818	1323	23.76	122.00	3125	30.8	28.6	1007.40	070	3.1	200	912	547.2
St..08	20120818	1704	23.76	122.51	3175	31.0	28.4	1007.04	076	2.6	200	1228	736.8
St.09	20120818	2009	23.75	122.99	3634	30.7	28.1	1007.75	122	3.0	200	859	515.4
St.10	20120819	0130	23.27	123.00	6065	30.4	28.2	1008.64	033	2.0	200	757	454.2
St.11	20120819	0458	23.01	122.50	5519	30.1	27.4	1006.33	029	3.4	200	981	588.6
St.12	20120819	0824	23.02	122.01	4877	30.3	28.0	1007.22	034	4.7	200	1147	688.2
St.13	20120819	1214	23.00	121.51	2059	30.5	28.4	1007.04	331	4.5	200	826	495.6
St.14	20120819	1557	22.68	121.26	1150	31.4	28.5	1005.26	043	3.8	200	901	540.6
St.15	20120819	1953	22.25	121.01	1210	30.3	27.9	1006.33	017	4.4	200	929	557.4
St.16	20120819	2323	22.26	121.50	492	30.3	28.0	1006.15	024	5.0	200	971	582.6
St.24	20120820	0650	21.51	121.01	1114	30.7	28.0	1004.37	056	8.5	200	847	508.2
St.25	20120820	1026	21.51	120.49	1561	30.5	28.2	1005.44	041	8.2	200	915	549.0
St.26	20120820	1345	21.51	119.99	2972	31.1	29.0	1004.02	032	4.6	200	1081	648.6
St.27	20120820	1702	21.49	119.50	2990	31.8	29.2	1004.02	43	0.0	200	859	515.4
St.28	20120820	2016	21.50	118.99	2773	31.6	28.9	1005.08	248	1.0	200	1044	626.4
St.29	20120820	2338	22.00	118.99	1402	31.1	28.7	1004.91	265	1.4	200	1094	656.4
St.30	20120821	0255	22.01	119.51	2416	31.1	28.5	1003.66	324	3.3	200	971	582.6
St.31	20120821	0625	22.00	120.00	1170	30.9	28.2	1003.84	090	5.0	200	846	507.6
St.32	20120821	0942	22.00	120.50	279	31.0	28.7	1004.73	314	3.3	200	1010	606.0
St.33	20120821	1219	22.37	120.33	448	31.2	29.0	1004.55	293	5.2	200	797	478.2
St.34	20120821	1443	22.50	120.00	649	31.8	29.2	1003.66	309	5.4	200	750	450.0
St.35	20120821	1809	22.50	119.51	236	31.2	28.0	1003.60	331	2.0	200	975	585.0
St.36	20120821	2138	22.50	119.00	86	30.8	27.8	1005.44	301	5.1	80	428	256.8
St.37	20120822	0010	22.95	119.10	28	28.9	26.6	1004.37	010	1.7	25	106	63.6
St.38	20120822	0229	23.00	119.49	76	30.3	27.8	1002.95	314	3.8	70	440	264.0
St.34-2	20120829	1653	22.50	120.00	667	30.3	28.1	1005.97	232	2.8	200	819	491.4
St.35-2	20120829	1952	22.50	119.50	224	29.3	27.5	1006.69	210	3.7	200	1030	618.0
St.36-2	20120829	2253	22.50	119.00	86	29.2	27.6	1007.22	209	5.6	81	350	210.0
St.37-2	20120830	0157	22.93	119.09	26	28.8	26.9	1006.51	023	2.2	18	102	61.2
St.38-2	20120830	0421	23.00	119.50	77	29.2	27.1	1006.69	168	3.8	70	339	203.4
St.39	20120830	0654	23.00	119.96	125	29.5	27.5	1007.40	183	3.4	120	693	415.8
St.40	20120830	0935	23.50	119.91	125	30.4	27.8	1008.29	235	3.0	120	519	311.4
St.41	20120830	1212	23.42	119.50	52	29.4	27.3	1007.04	211	3.4	43	211	126.6
St.42	20120830	1520	23.50	119.00	51	29.7	27.4	1005.08	215	3.6	45	268	160.8
St.43	20120830	1812	24.00	119.00	57	30.2	27.8	1006.15	208	1.4	50	205	123.0
St.44	20120830	2057	23.99	119.50	62	29.7	27.1	1007.75	188	3.6	55	262	157.2
St.45	20120831	0008	24.00	120.00	41	29.5	27.0	1007.40	077	2.6	37	226	135.6
St.46	20120831	0410	24.50	120.50	49	29.5	27.1	1007.22	050	2.6	45	195	117.0
St.47	20120831	0706	24.50	120.01	60	29.5	27.4	1007.75	021	1.7	55	257	154.2
St.48	20120831	1011	24.50	119.50	67	30.1	28.6	1008.47	297	1.4	60	405	243.0
St.49	20120831	1414	25.00	120.00	52	30.9	28.2	1006.33	014	5.5	45	244	146.4
St.50	20120831	1645	25.01	120.50	75	30.4	28.1	1006.69	075	5.0	68	369	221.4
St.51	20120831	1920	25.08	120.92	70	30.0	27.1	1007.22	141	0.0	44	222	133.2
St.52	20120831	2245	25.50	120.50	66	29.9	27.5	1008.47	062	6.1	61	264	158.4
St.53	20120901	0242	25.99	120.99	77	29.7	27.3	1006.86	082	12.0	70	307	184.2
St.54	20120901	0610	25.50	121.01	90	29.5	27.2	1007.22	131	1.0	85	436	261.6
St.55	20120901	0931	25.50	121.49	113	29.7	27.3	1007.93	117	8.9	110	394	236.4
St.56	20120901	1240	26.00	121.50	68	30.0	27.8	1008.29	115	7.2	60	321	192.6
St.57	20120901	1512	26.00	121.99	99	30.4	27.7	1007.22	097	10.8	90	464	278.4
St.58	20120901	1805	26.00	122.50	106	30.7	27.6	1008.47	105	5.3	101	503	301.8
St.59	20120901	2101	26.00	123.00	96	30.2	27.1	1009.89	097	5.8	91	403	241.8
St.60	20120902	0024	25.50	123.00	775	29.5	27.4	1009.00	134	7.4	200	1209	725.4
St.61	20120902	0345	25.51	122.51	443	30.0	27.1	1007.93	190	4.2	200	861	516.6
St.62	20120902	0649	25.50	122.00	119	29.6	27.3	1007.93	149	5.1	113	448	268.8

表 04. 2012-10-31 航次基礎觀測資料
Chart 04. Basic observation data in Oct.2012

Station	Date	SMT	Lati.	Long.	Depth	SST	Air T.	Air P.	Wind D.	Wind F.	O.N.D	Fl. Ct.	V.M.S.
St.01	20121031	1720	24.87	122.00	294	24.2	20.9	1013.98	028	10.4	200	827	496.2
St.02	20121031	2058	25.04	122.48	1335	25.7	22.7	1014.52	027	15.0	200	1033	619.8
St.03	-	-	-	-	-	-	-	-	-	-	-	-	-
St.04	20121101	0110	24.54	122.51	577	26.4	20.3	1014.16	036	13.2	200	785	471.0
St.05	20121101	0440	24.51	122.01	874	25.6	20.6	1014.87	007	11.4	200	810	486.0
St.06	20121101	0930	24.01	121.69	363	26.5	21.5	1017.19	024	10.0	200	998	598.8
St.07	20121101	1218	23.77	122.00	3120	26.2	21.7	1014.52	005	12.7	200	1244	746.4
St.08	20121101	1603	23.76	122.50	3255	26.7	23.1	1014.16	032	9.3	200	1030	618.0
St.09	20121101	1953	23.76	123.00	3653	26.4	21.6	1015.41	050	11.9	200	967	580.2
St.10	20121102	0135	23.02	123.00	2700	26.5	21.7	1014.52	068	10.3	200	1001	600.6
St.11	20121102	0457	23.01	122.50	5509	26.9	22.1	1013.98	042	8.1	200	787	472.2
St.12	20121102	0804	23.02	122.01	4953	26.7	22.0	1016.12	034	7.6	200	1125	675.0
St.13	20121102	1145	23.01	121.50	2003	26.3	21.9	1013.98	006	9.3	200	965	579.0
St.14	20121102	1442	22.67	121.25	1147	27.0	23.5	1012.20	029	10.6	200	963	577.8
St.15	20121102	1759	22.26	120.99	1200	27.7	23.9	1012.74	021	11.7	200	1254	752.4
St.16	20121102	2146	22.26	121.49	532	27.2	24.3	1013.98	020	6.6	200	1094	656.4
St.17	20121103	0126	22.26	122.00	2704	27.6	24.7	1012.56	081	6.7	200	894	536.4
St.18	20121103	0520	22.26	122.50	2710	27.7	24.6	1013.45	067	8.0	200	1254	752.4
St.19	20121103	0903	22.25	123.00	3547	27.3	22.5	1014.52	047	11.7	200	1428	856.8
St.20	20121103	1418	21.50	123.00	5003	27.3	24.4	1011.31	066	11.8	200	822	493.2
St.21	20121103	1738	21.50	122.50	4791	27.2	23.7	1011.67	079	12.8	200	1461	876.6
St.22	20121103	2102	21.51	122.00	3486	27.4	24.2	1012.56	085	9.3	200	866	519.6
St.23	20121104	0042	21.51	121.51	2066	27.7	24.8	1011.67	049	6.7	200	845	507.0
St.24	20121104	0450	21.52	121.01	1129	27.4	23.9	1011.31	024	10.5	200	1171	702.6
St.25	20121104	0838	21.50	120.51	1805	27.8	24.4	1012.56	033	9.3	200	849	509.4
St.26	20121104	1210	21.49	120.30	2568	27.9	25.3	1012.20	024	7.7	200	1103	661.8
St.27	20121104	1529	21.52	119.50	2950	28.5	25.4	1009.53	036	6.2	200	1250	750.0
St.28	20121104	1852	21.51	119.01	2795	28.3	25.6	1011.14	038	8.3	200	998	598.8
St.29	20121104	2235	22.00	119.00	1442	27.7	24.8	1012.03	032	8.7	200	584	350.4
St.30	20121105	0205	22.01	119.51	2398	28.0	25.1	1010.78	019	10.0	200	1161	696.6
St.31	20121105	0540	22.00	120.01	1172	28.0	24.5	1011.85	354	6.1	200	1292	775.2
St.32	20121105	0837	22.00	120.51	342	27.9	25.6	1013.45	058	4.1	200	1057	634.2
St.33	20121105	1155	22.37	120.33	372	28.5	26.9	1011.49	231	0.0	200	1149	689.4
St.34	20121105	1432	22.50	120.01	626	28.2	24.9	1010.60	355	5.4	200	904	542.4
St.35	20121105	1801	22.50	119.51	232	27.7	24.3	1011.85	016	9.7	200	821	492.6
St.36	20121105	2112	22.50	119.00	84	27.4	23.6	1012.74	029	9.6	75	699	419.4
St.37	20121106	0020	22.94	119.10	27	27.1	23.5	1013.45	017	13.9	17	200	120.0
St.38	20121106	0256	23.00	119.50	77	26.9	23.7	1012.03	021	12.3	72	321	192.6
St.39	20121106	0539	23.00	119.91	127	26.8	22.9	1012.74	027	9.3	119	804	482.4
St.40	20121106	0913	23.50	119.91	122	27.1	23.2	1014.52	020	14.2	110	253	151.8
St.41	20121106	1139	23.44	119.50	59	26.8	22.8	1013.45	022	14.5	50	290	174.0
St.42	20121106	1428	23.50	119.00	55	26.2	22.7	1012.56	030	13.7	47	299	179.4
St.43	20121106	1827	23.98	119.00	58	25.1	21.8	1014.52	037	14.0	52	257	154.2
St.44	20121106	2200	24.01	119.49	60	25.7	22.2	1014.34	029	15.0	55	360	216.0
St.45	20121107	0150	24.01	120.00	42	25.4	21.8	1012.38	035	18.6	30	234	140.4
St.46	20121107	0731	24.50	120.50	50	25.4	20.9	1013.98	040	16.0	45	346	207.6
St.47	20121107	1021	24.50	120.00	61	25.0	21.1	1014.70	032	14.4	53	332	199.2
St.48	20121107	1258	24.51	119.56	38	24.9	21.0	1013.09	033	12.9	30	178	106.8
St.49	20121107	1705	24.96	119.96	56	24.6	20.8	1013.09	036	13.8	50	359	215.4
St.50	20121107	2021	25.00	120.50	76	24.6	22.1	1013.09	048	10.4	69	314	188.4
St.51	20121107	2304	25.09	120.91	72	25.6	22.3	1013.63	061	9.1	65	390	234.0
St.52	20121108	0227	25.51	120.49	62	24.7	21.9	1013.45	055	9.4	55	382	229.2
St.53	20121108	0635	26.00	121.01	78	25.7	22.8	1013.98	093	8.1	72	418	250.8
St.54	20121108	0950	25.50	121.01	90	26.0	23.3	1013.27	157	2.8	83	630	378.0
St.55	20121108	1242	25.50	121.50	113	25.7	23.2	1011.49	133	6.6	108	588	352.8
St.56	20121108	1555	26.00	121.50	68	25.6	22.8	1011.14	146	4.1	60	656	393.6
St.57	20121108	1838	26.00	122.01	100	26.0	23.1	1011.85	169	8.3	95	683	409.8
St.58	20121108	2116	26.00	122.50	105	26.6	24.1	1012.74	177	10.3	100	508	304.8
St.59	20121109	0016	26.00	123.00	94	27.1	24.5	1012.03	172	10.5	90	494	296.4
St.60	20121109	0330	25.50	123.00	775	27.3	24.5	1010.60	177	14.1	200	1326	795.6
St.61	20121109	0705	25.50	122.50	454	27.1	23.6	1012.56	236	12.5	200	886	531.6
St.62	20121109	1023	25.49	122.00	120	25.7	23.1	1013.45	265	4.2	112	733	439.8

2012年台灣周邊海域漁場環境 監測航次報告

Cruise Report of TaiCOFI Surveys in 2012

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