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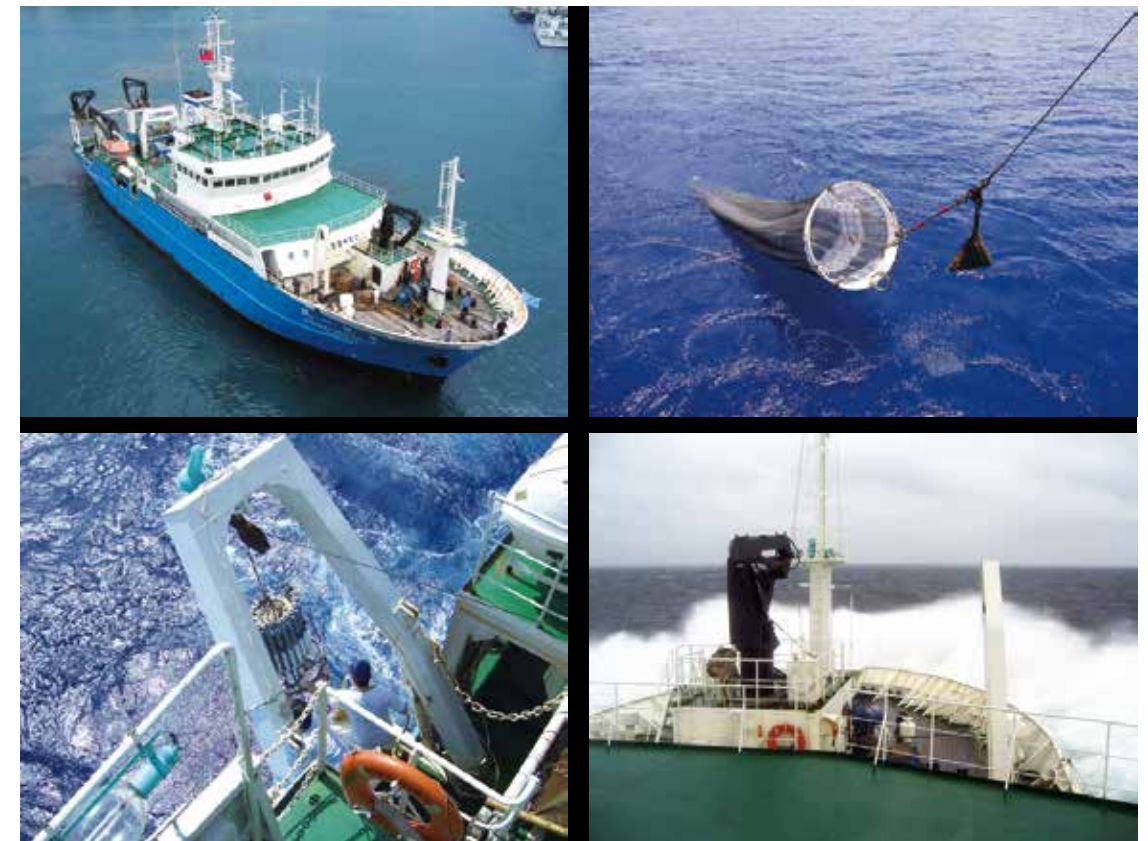
2011 年台灣周邊海域漁場環境監測航次報告
Cruise Report of TaiCOFI Surveys in 2011

行政院農業委員會水產試驗所



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2011 年台灣周邊海域漁場環境監測航次報告



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序

台灣位於黑潮、大陸沿岸流及南海海流交會處，周邊海域擁有豐沛的海洋資源，漁業一直以來為台灣重要的基礎產業。2012 年我國漁業產值達農業總產值的四分之一，水產品自給率為 153 %，居國內各類食糧之冠，提供國人最重要的優良蛋白質來源。此外，台灣長期以來為水產品貿易的出超國，2012 年水產品外匯收入達 20 億美元，為我國帶來可觀的經濟收益，並促進我國整體經濟的發展。

但由於近年來海洋漁業面臨全球氣候變遷、生態環境惡化、漁業資源銳減、國際漁業情勢丕變等多重因素影響下，使得台灣的漁業經營環境愈顯嚴峻。水產試驗所為我國水產科技的核心研發機構，為提升我國漁業科研之學術能量，自 2003 年起著手實施「台灣周邊海域漁場環境監測」計畫，迄今連續 11 年按季於我國經濟海域內的 62 個測站進行調查，期盼建立長期的漁場環境資訊，以提供相關學術研究及生態漁業管理的重要參考。

本專刊以雙語方式詳實記載 2011 年出海調查成果，提供重要漁場環境資訊作為國內相關單位之參考與應用，並使國際學術單位亦能夠探究本所同仁共同努力所展現出的研究成果。綜上所述，希冀在本計畫持續推動下，本所能實質對我國水產科研國際接軌、生態漁業管理政策與學術應用上有所貢獻，進而提升我國漁業科研之學術能量，創造水產永續利用之契機。

所長

郭慶老

謹誌

中華民國一零二年十二月

Preface

The waters around Taiwan is dominated by the Kuroshio Current, China Coastal Current and the South China Seas waters, and is abundant in fisheries resources. Thus, fishery has been an important fundamental industry in Taiwan. In 2012, the value of product from fishery reached one fourth of the total production of the agricultural sector in Taiwan and the degree of self-sufficiency of fishery was 153 %, which was also the highest among other food items. Besides, Taiwan is a trade-surplus country in fishery products for a long time and the foreign exchange reached 2 billion US dollars in 2012. The economic benefit from fishery is considerable.

In recent years, marine capture fishery in Taiwan was encountering the challenge of climate change, deterioration of the marine environment, and the decline of fishery resources, as well as competition of global trade. Thus, Fisheries research institute (FRI) has dedicated to researches to achieve the goals of sustainable utilization of fishery resource. Therefore, 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 11 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 2011”, 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



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 2011 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：100 農科-10.2.2-水-A1）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。本年度 1 月航次由於海象惡劣，僅完成 36 個測站之採樣；4 月航次則為因應日本福島核災奉命赴西北太平洋秋刀魚場採樣，臨時縮減航程亦僅完成 36 個測站。本計畫內容涉及廣泛專業領域，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 2011 of the TaiCOFI program. Standard procedures of field program and sample analysis are described in detail. For January cruise, only 36 stations were completed due to the heavy weather during the period. For April cruise, *Fishery Researcher I* was assigned to collect the saury samples in the northwestern Pacific due to the Fukushima Daiichi nuclear disaster, therefore, only 36 stations were completed. 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 2011 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 2011. 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、 Na_2SO_3 及 NaHSO_3 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（該瓶分量為 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/m³).

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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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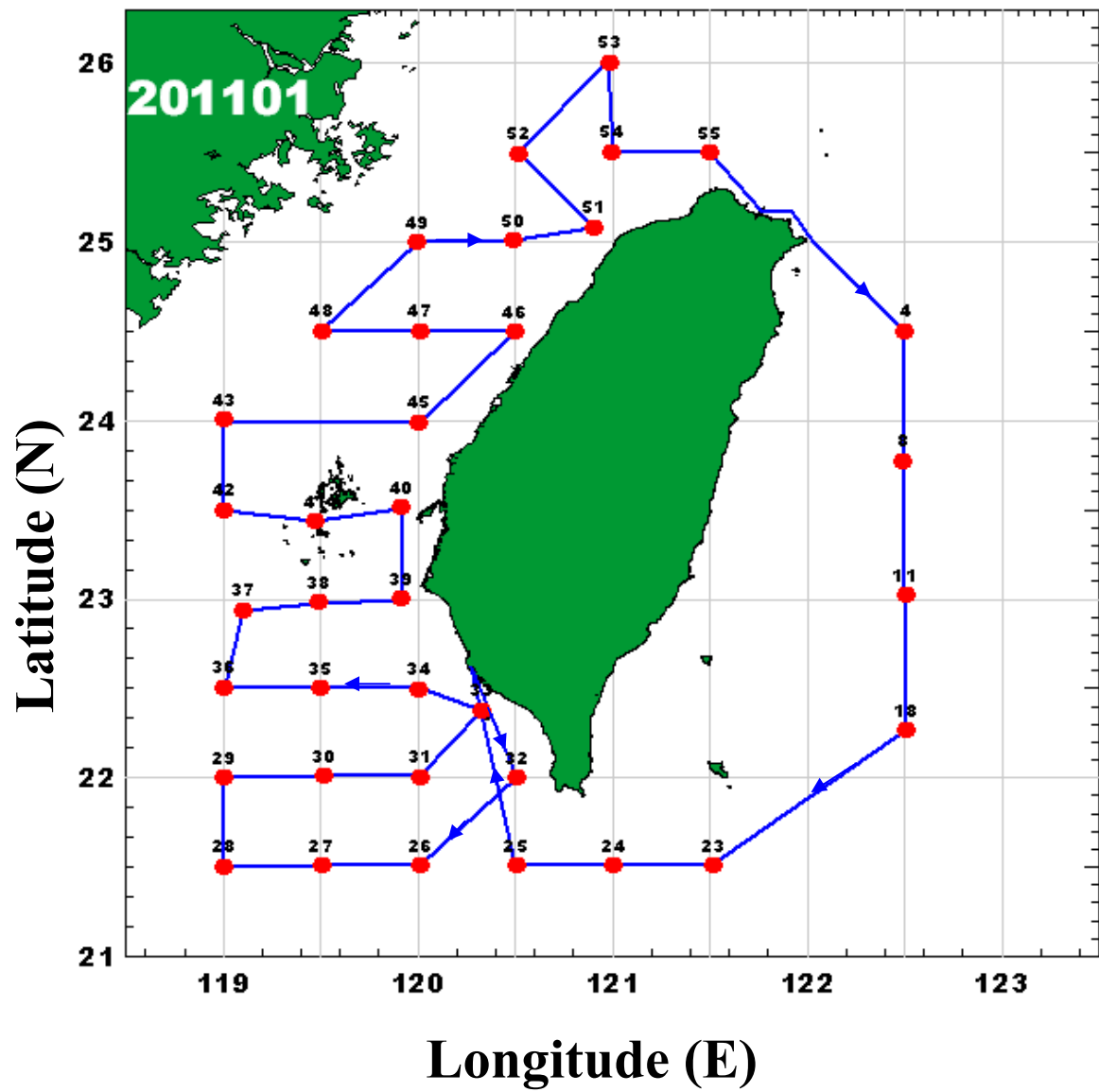


圖 01. 2011-01 航次航跡圖

Fig. 01. Stations and Cruise tracks for TaiCOFI Survey in Jan. 2011.

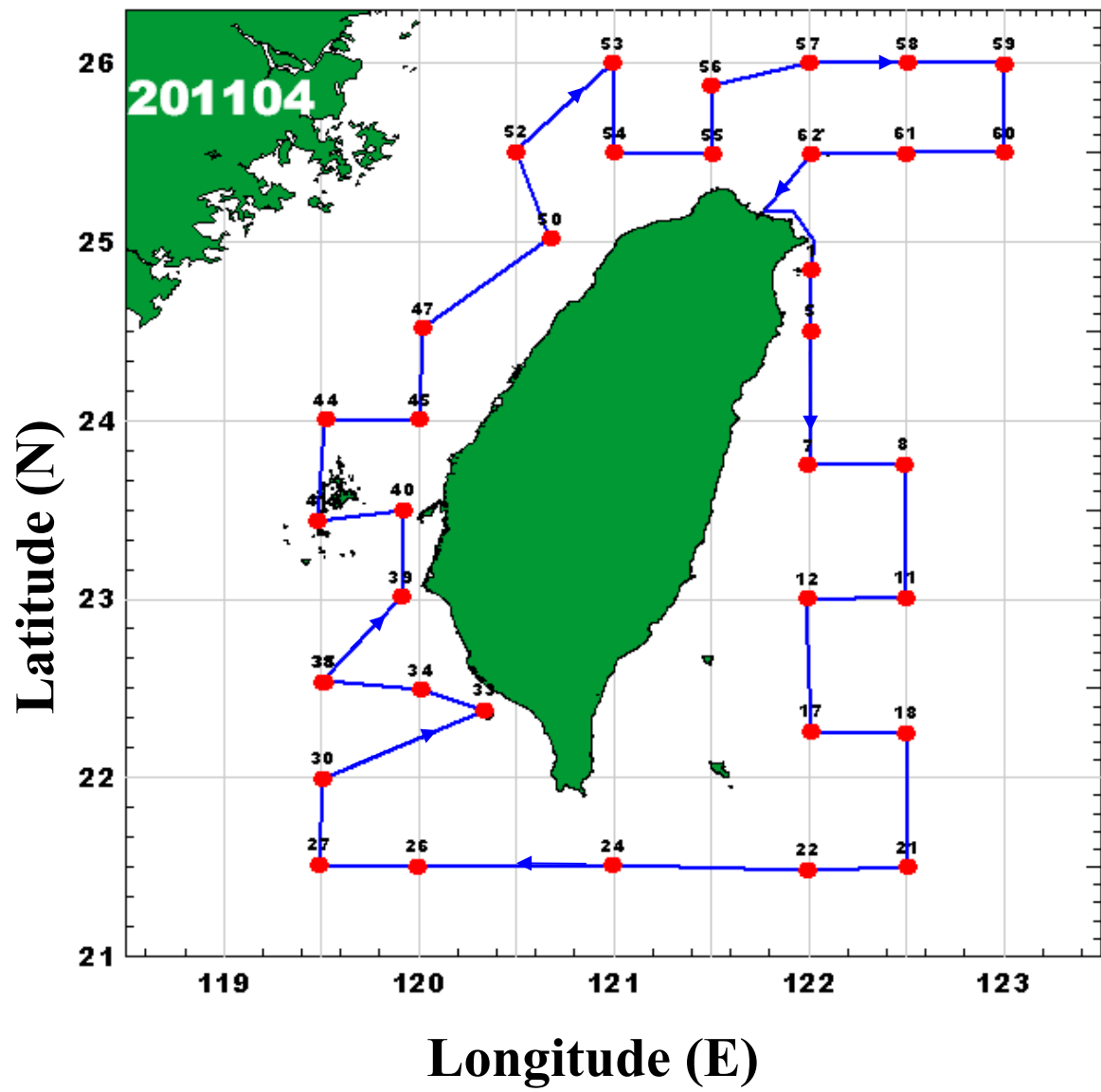


圖 02. 2011-04 航次航跡圖

Fig. 02. Stations and Cruise tracks for TaiCOFI Survey in Apr. 2011.

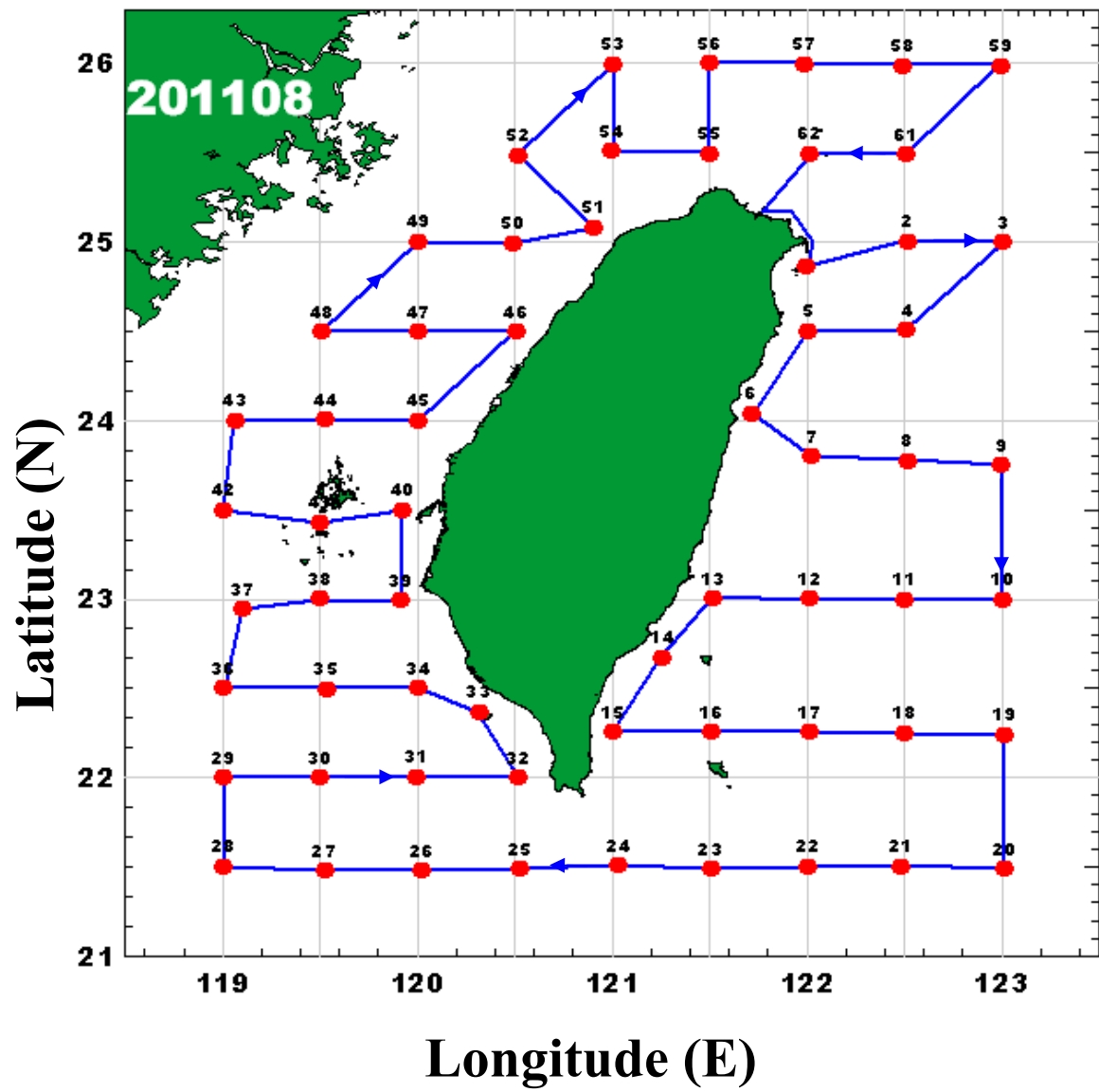


圖 03. 2011-08 航次航跡圖

Fig. 03. Stations and Cruise tracks for TaiCOFI Survey in Aug. 2011.

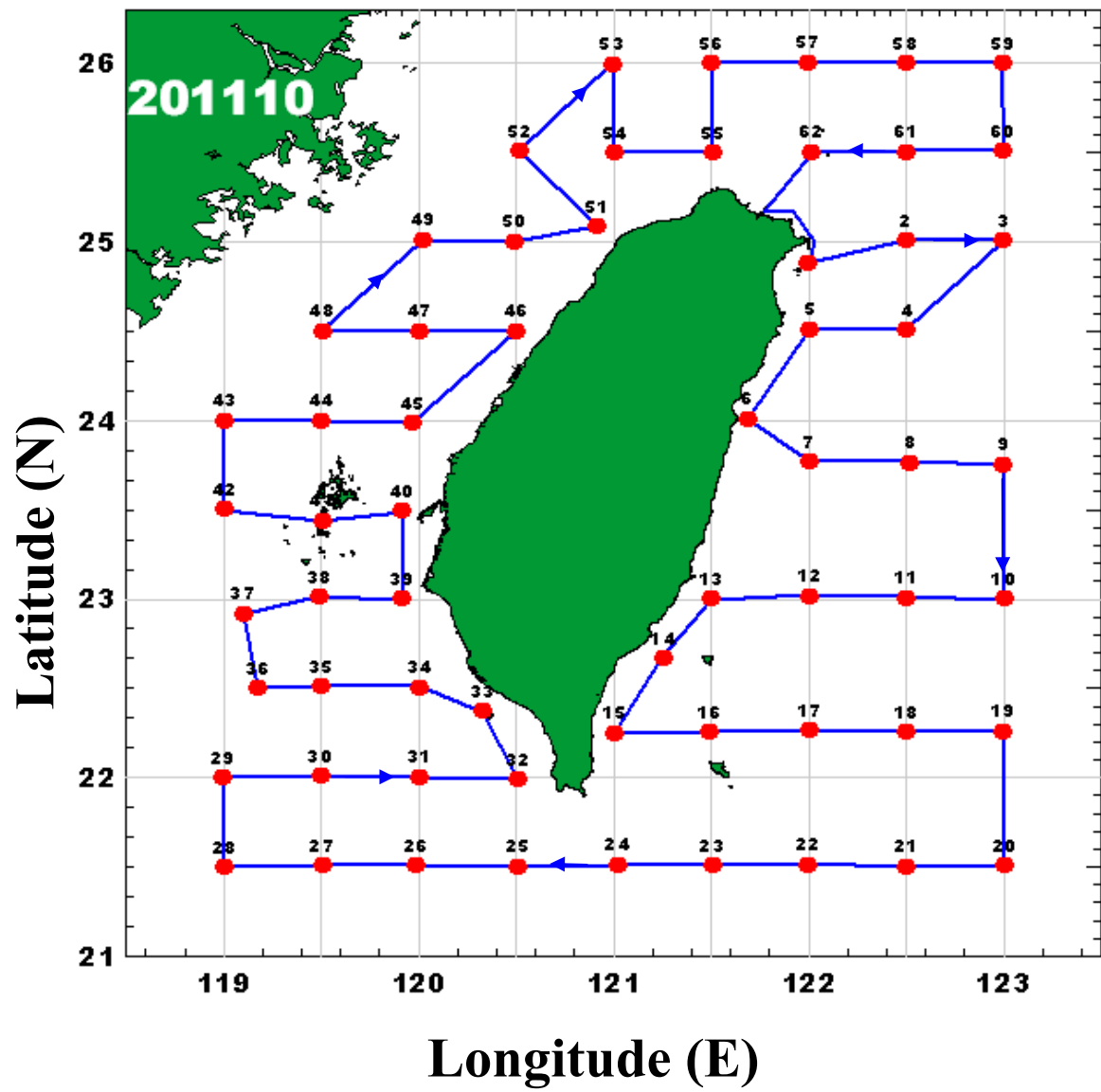


圖 04. 2011-10 航次航跡圖

Fig. 04. Stations and Cruise tracks for TaiCOFI Survey in Oct. 2011.

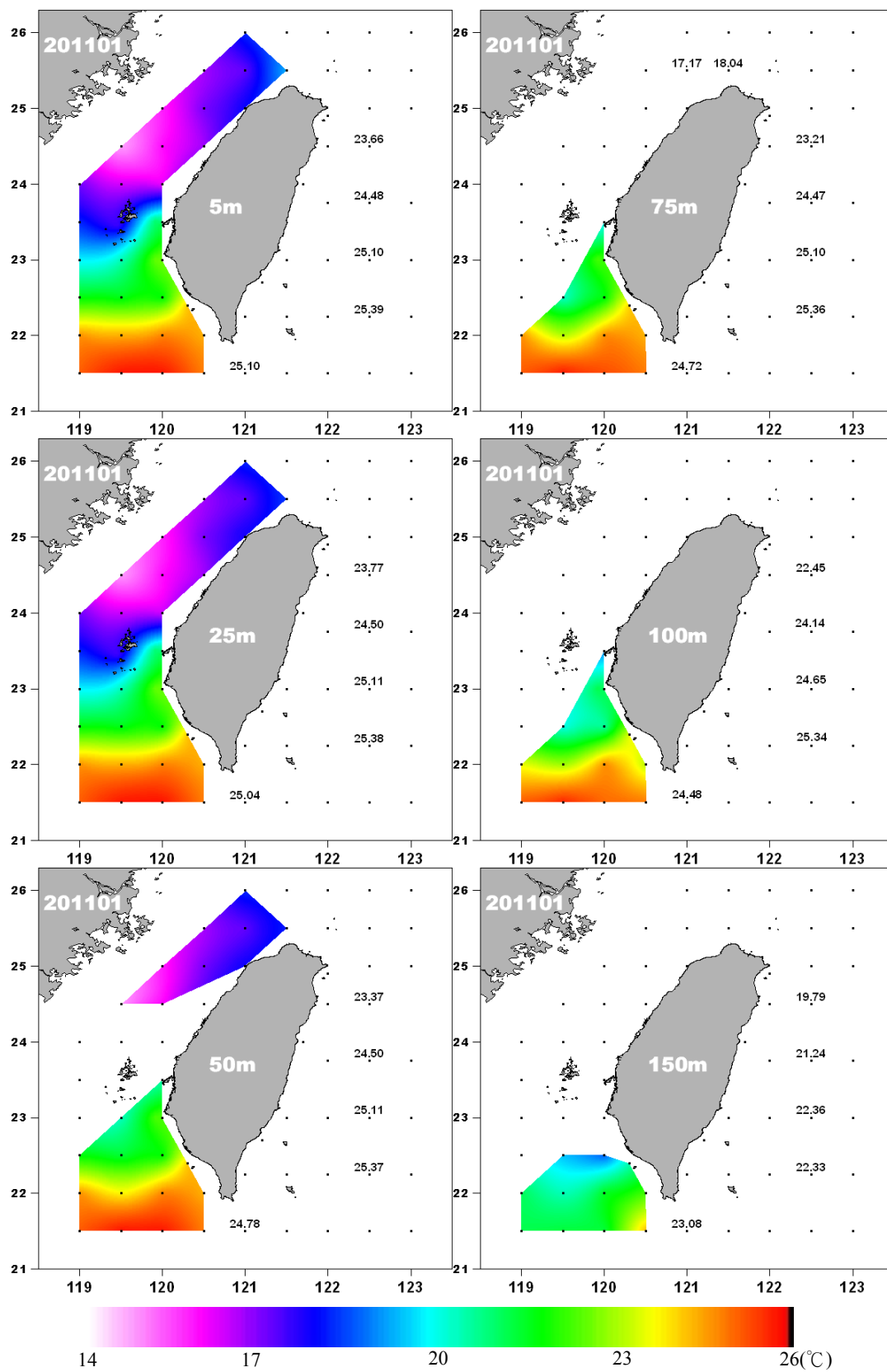


圖 05. 2011-01 航次水溫分布
Fig. 05. Temperature distribution in Jan. 2011.

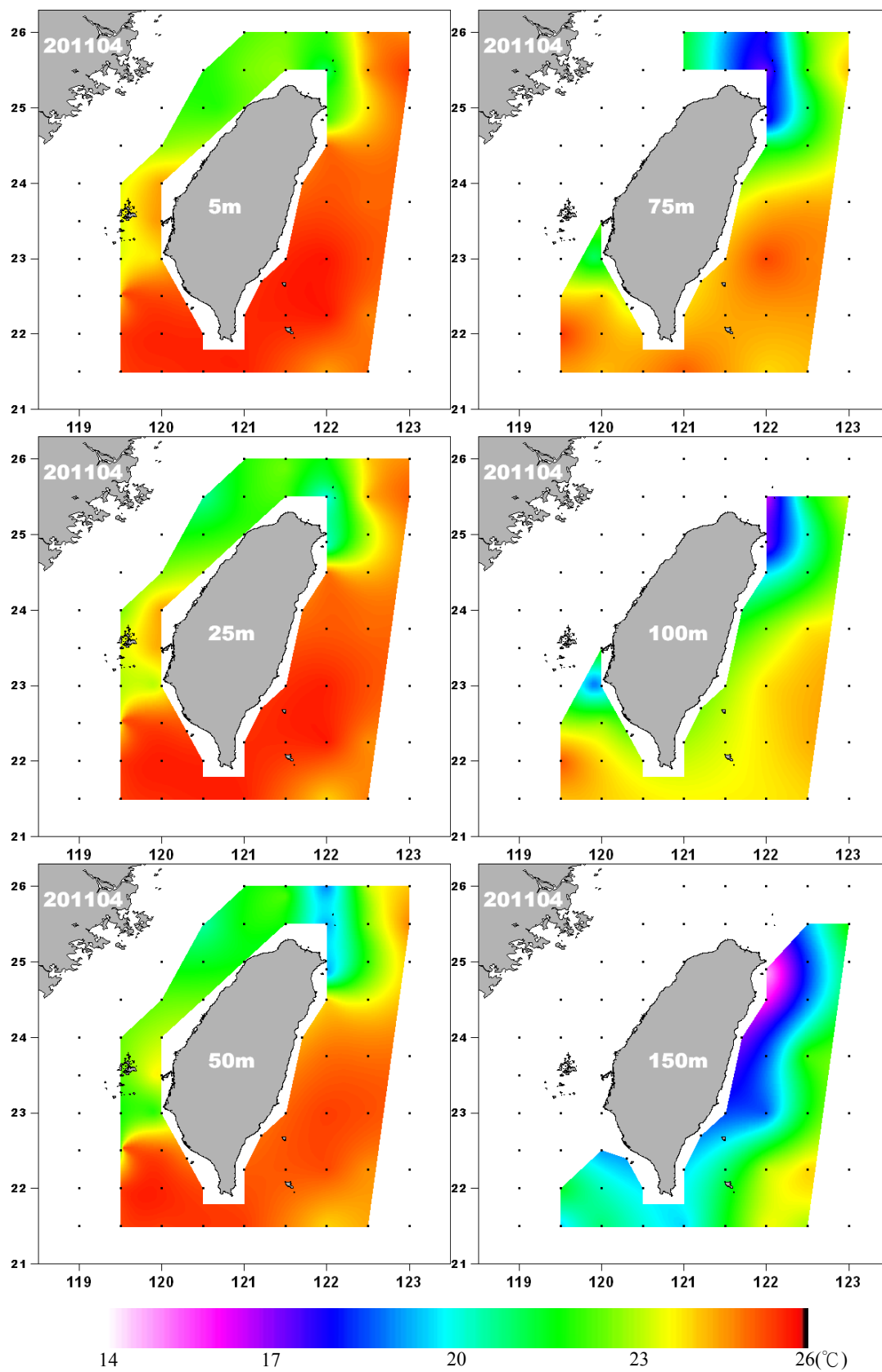


圖 06. 2011-04 航次水溫分布
Fig.06. Temperature distribution in Apr. 2011.

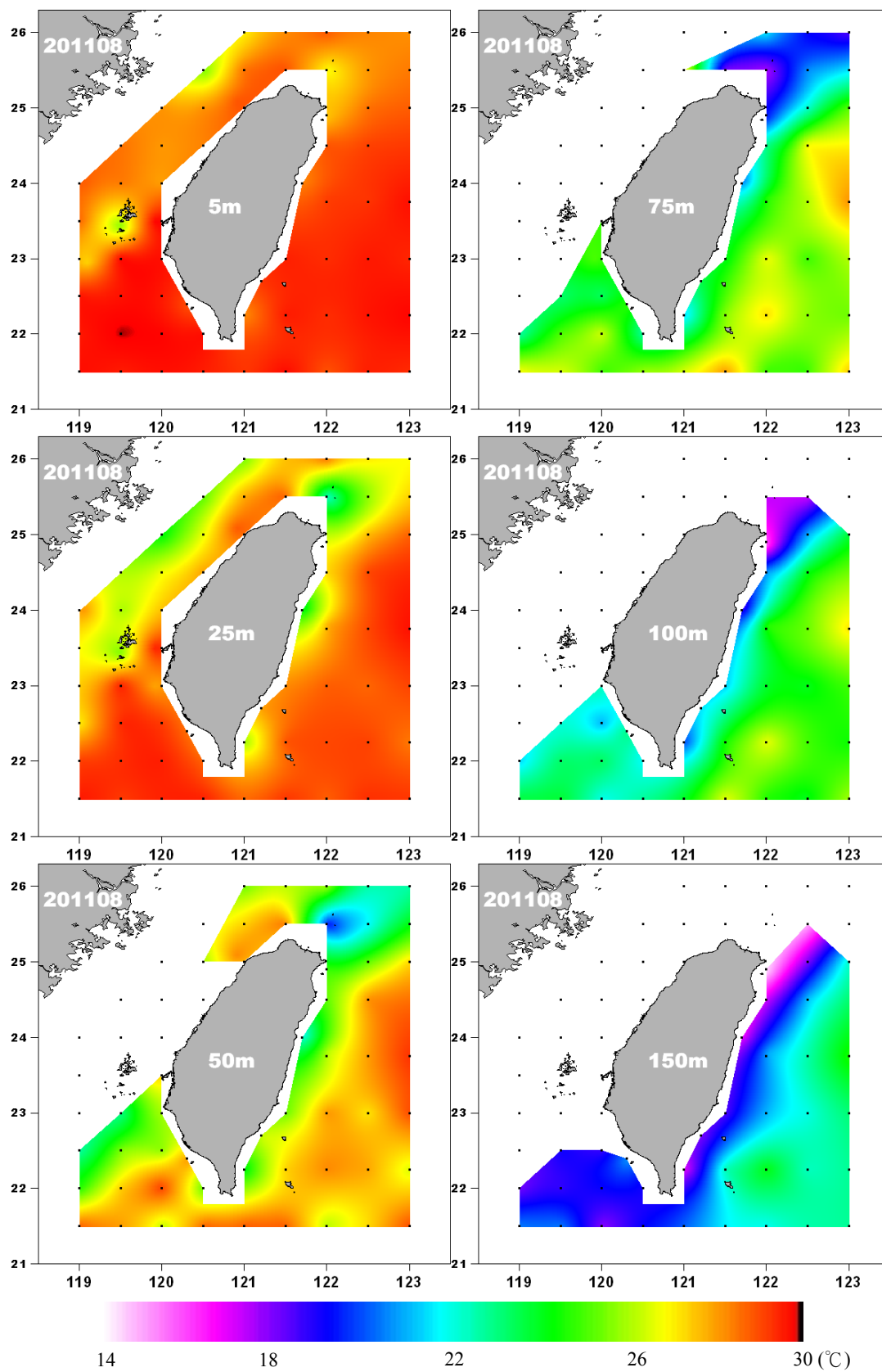


圖 07. 2011-08 航次水溫分布

Fig. 07. Temperature distribution in Aug. 2011.

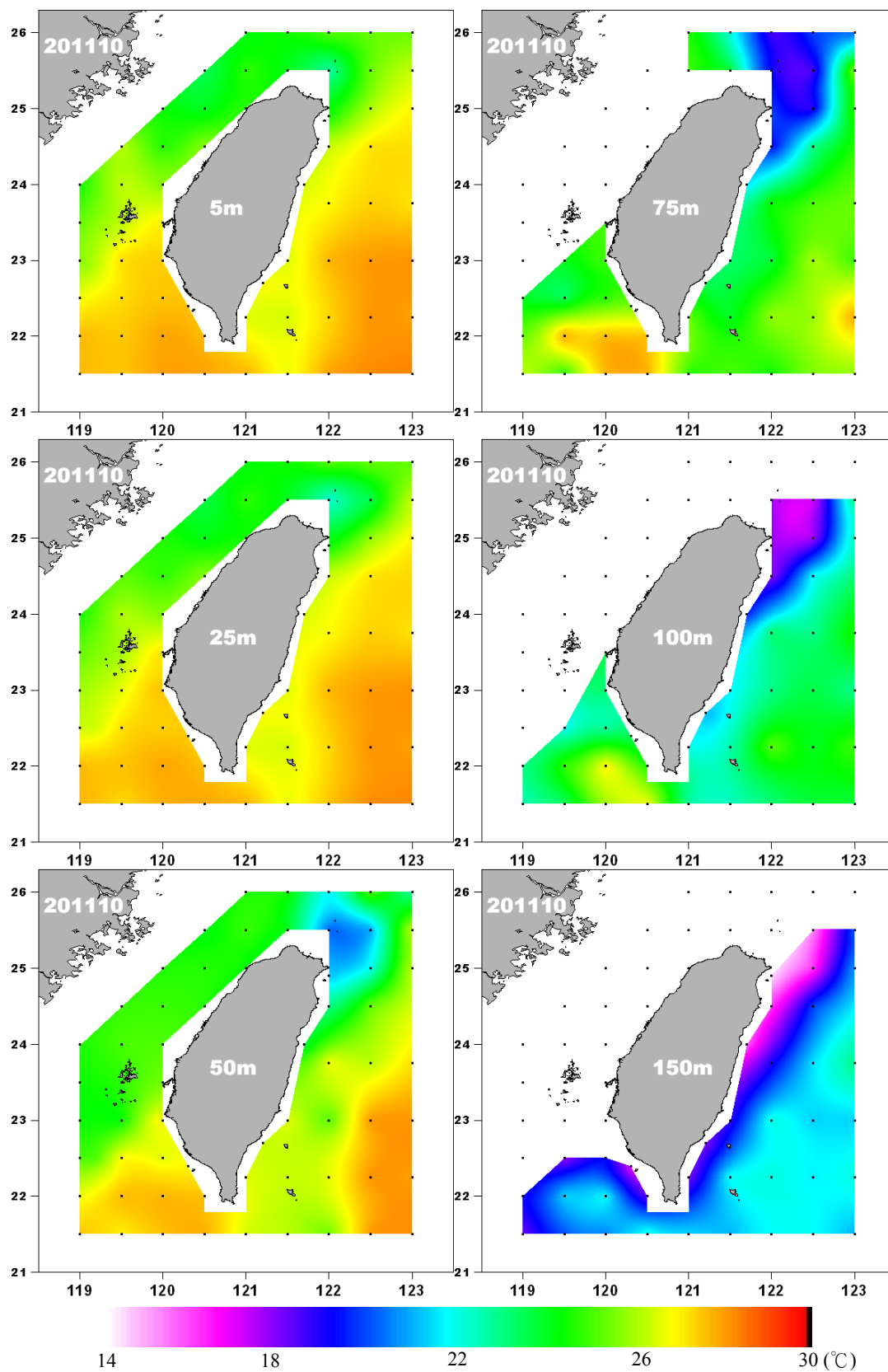


圖 08. 2011-10 航次水溫分布
Fig. 08. Temperature distribution in Oct. 2011.

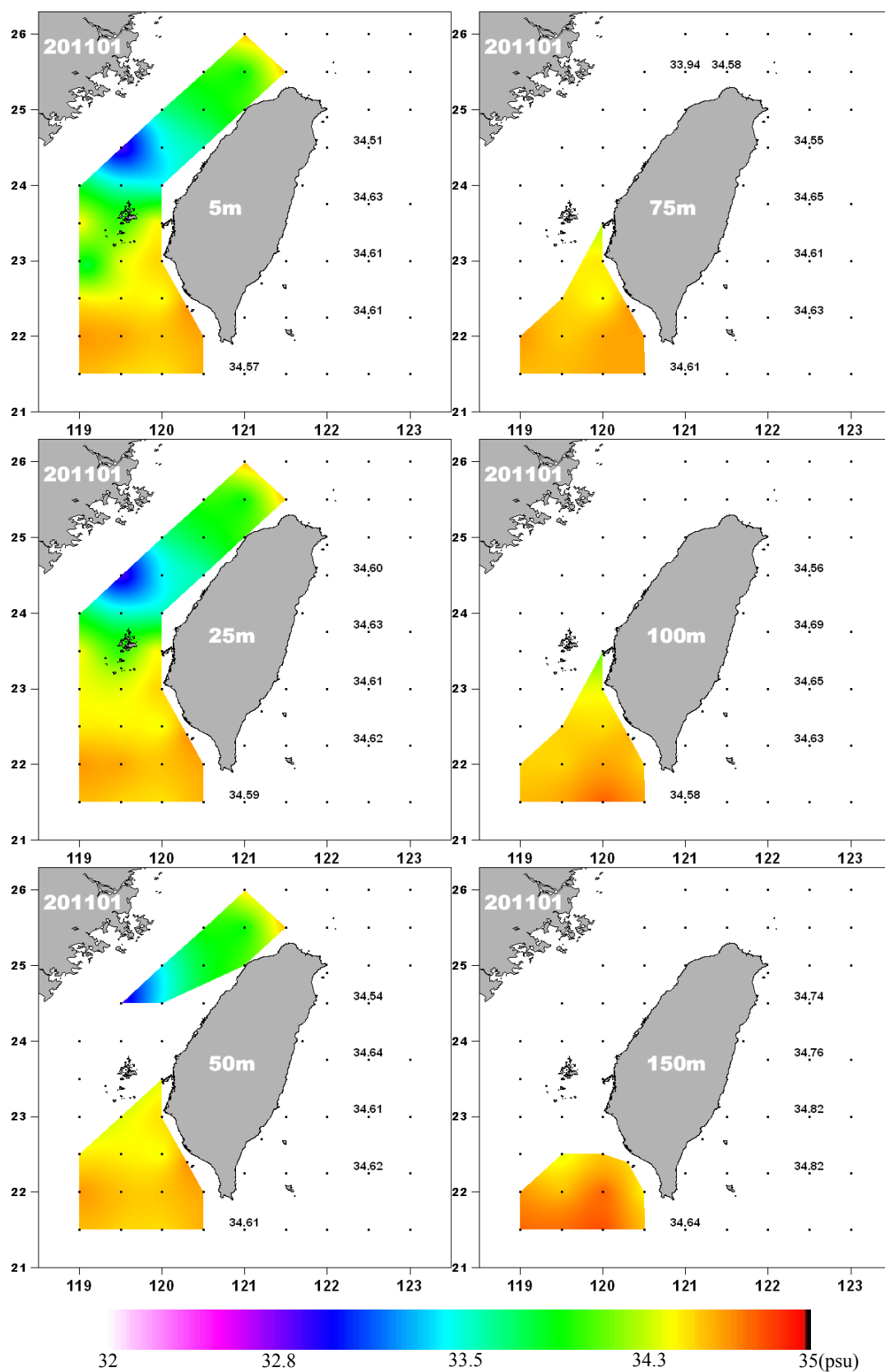


圖 09. 2011-01 航次鹽度分布
Fig. 09. Salinity distribution in Jan. 2011.

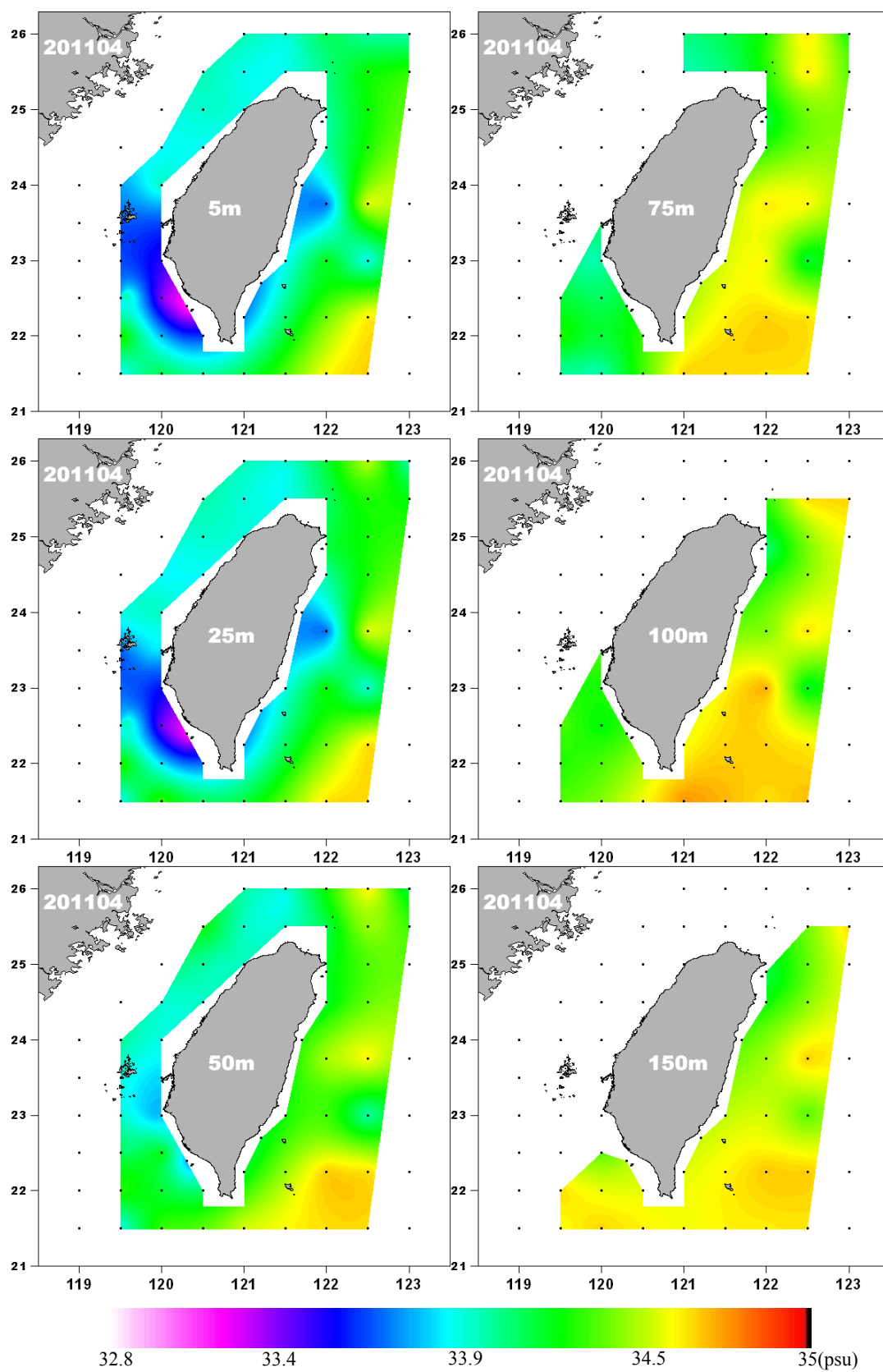


圖 10. 2011-04 航次鹽度分布
Fig. 10. Salinity distribution in Apr. 2011.

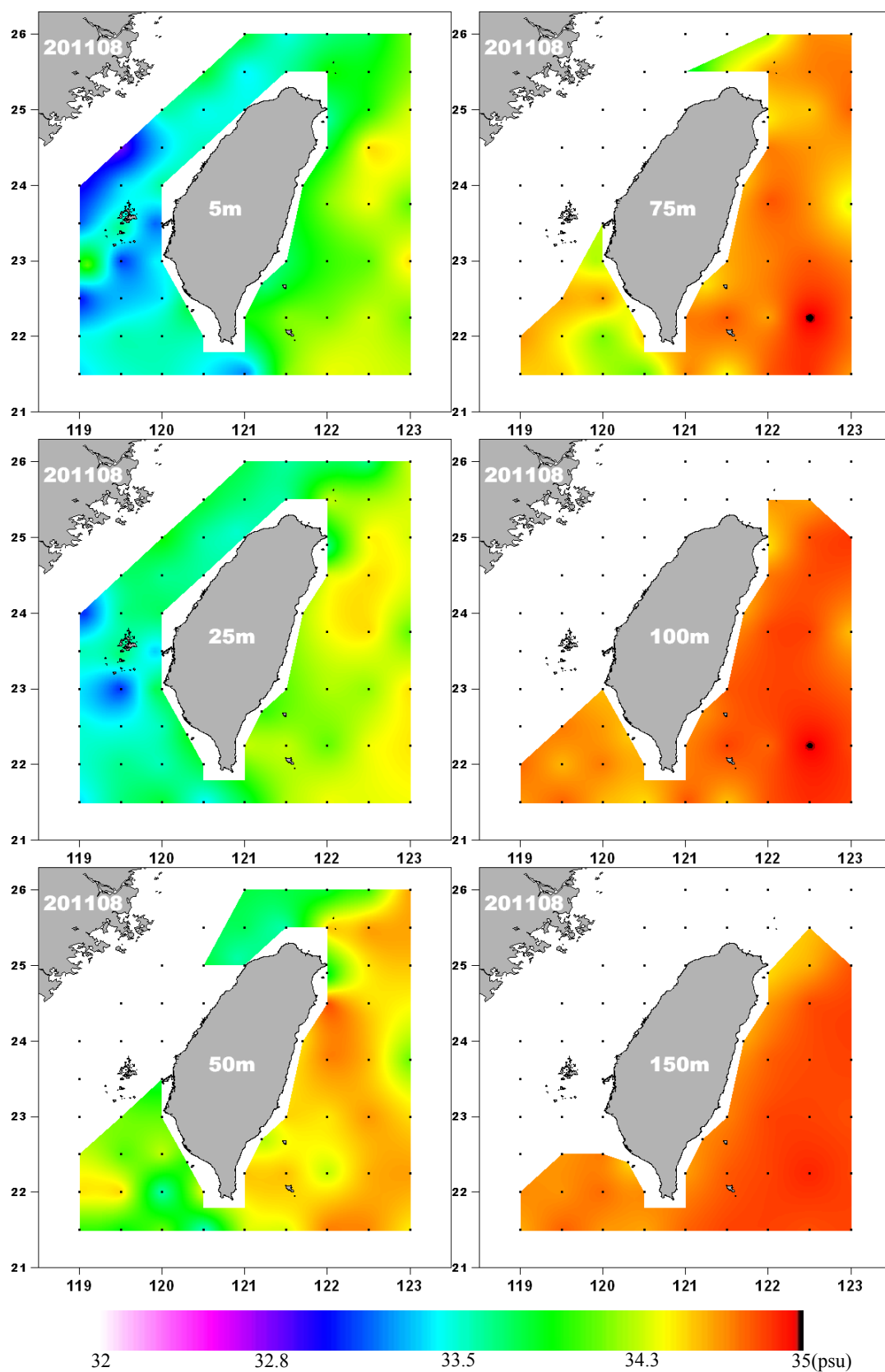


圖 11. 2011-08 航次鹽度分布
Fig. 11. Salinity distribution in Aug. 2011.

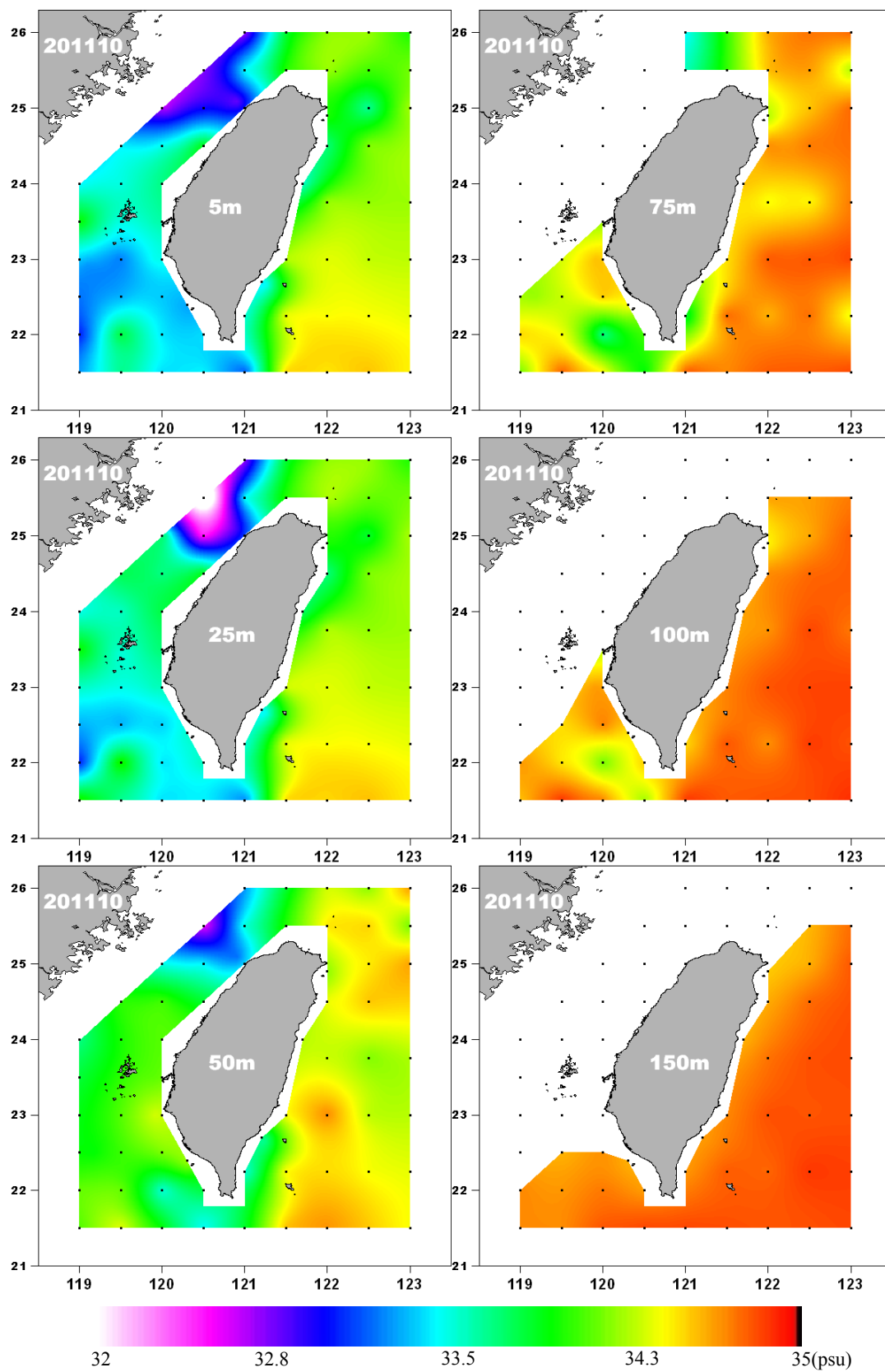


圖 12. 2011-10 航次鹽度分布
Fig. 12. Salinity distribution in Oct. 2011.

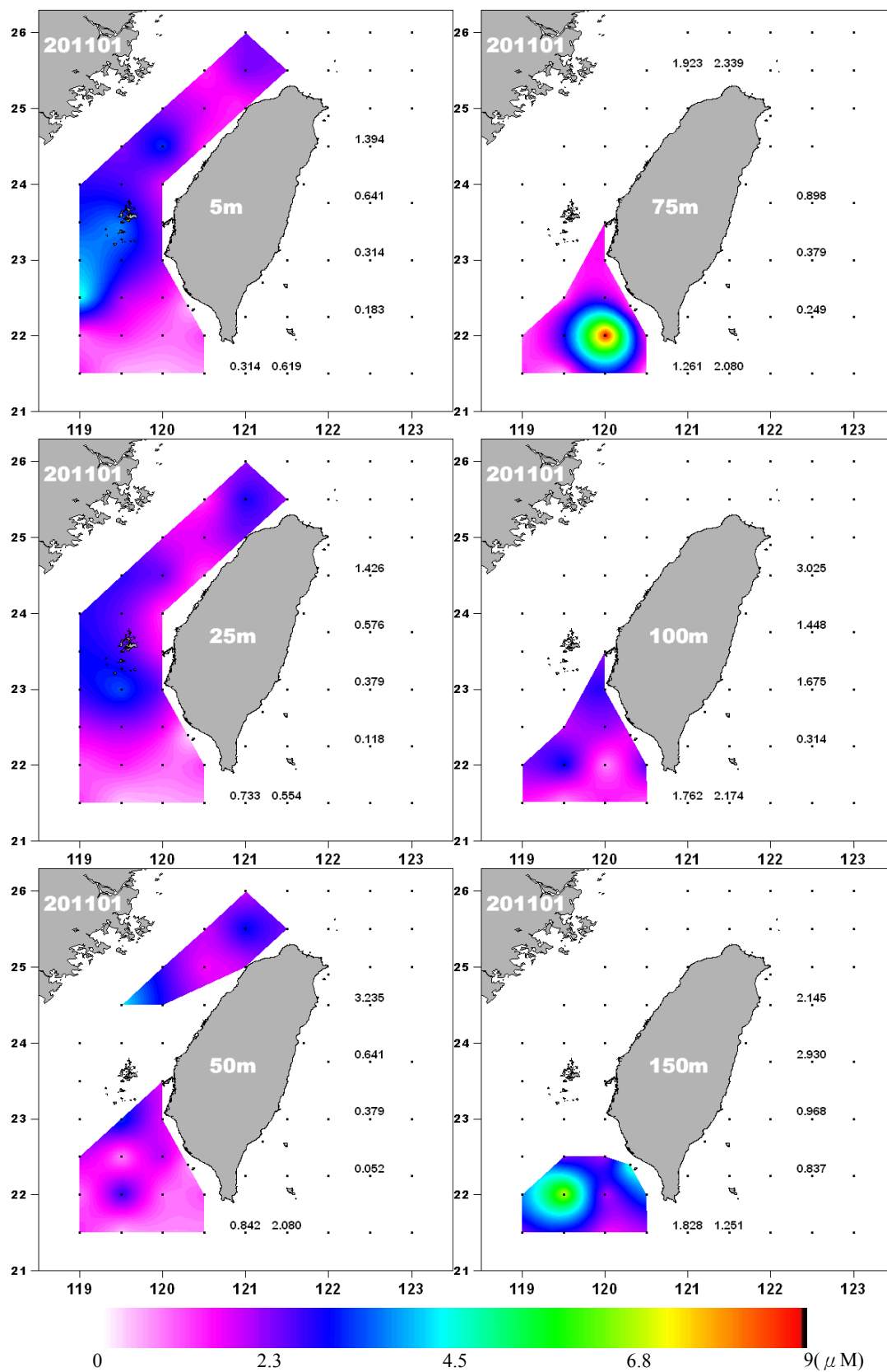


圖 13. 2011-01 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 13. Nitrate (NO_3^-) distribution in Jan. 2011.

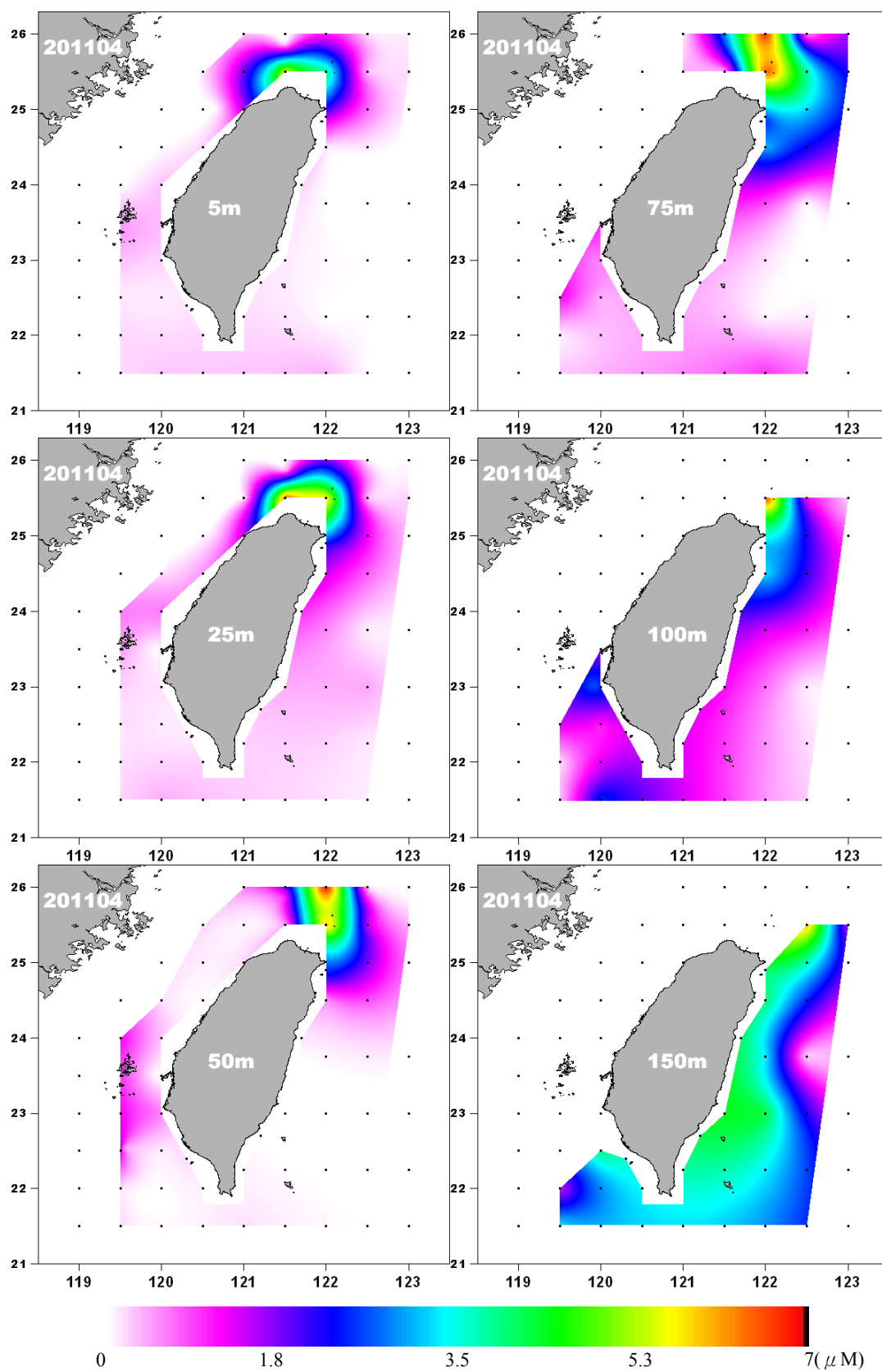


圖 14. 2011-04 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 14. Nitrate (NO_3^-) distribution in Apr. 2011.

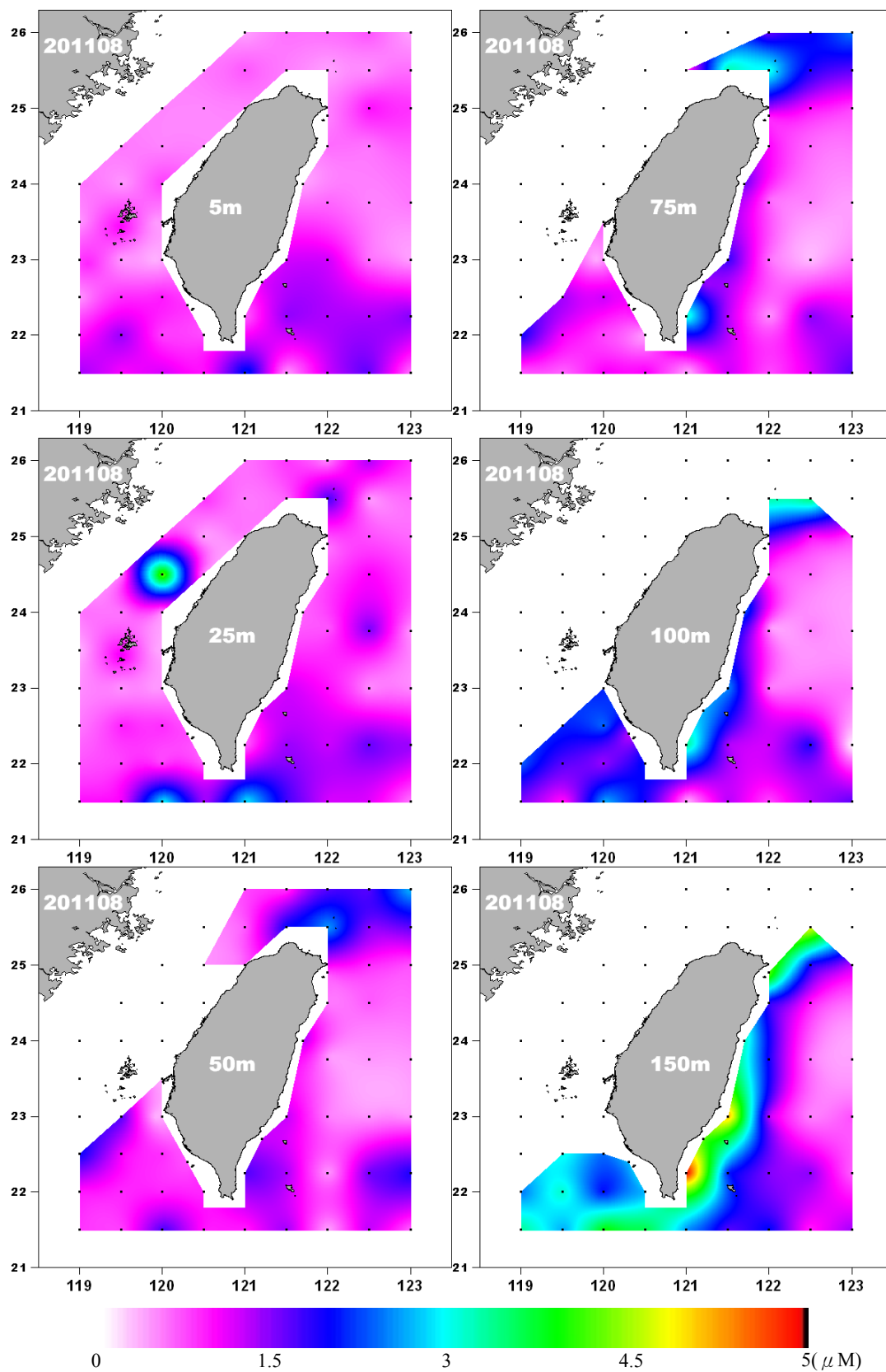


圖 15. 2011-08 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 15. Nitrate (NO_3^-) distribution in Aug. 2011.

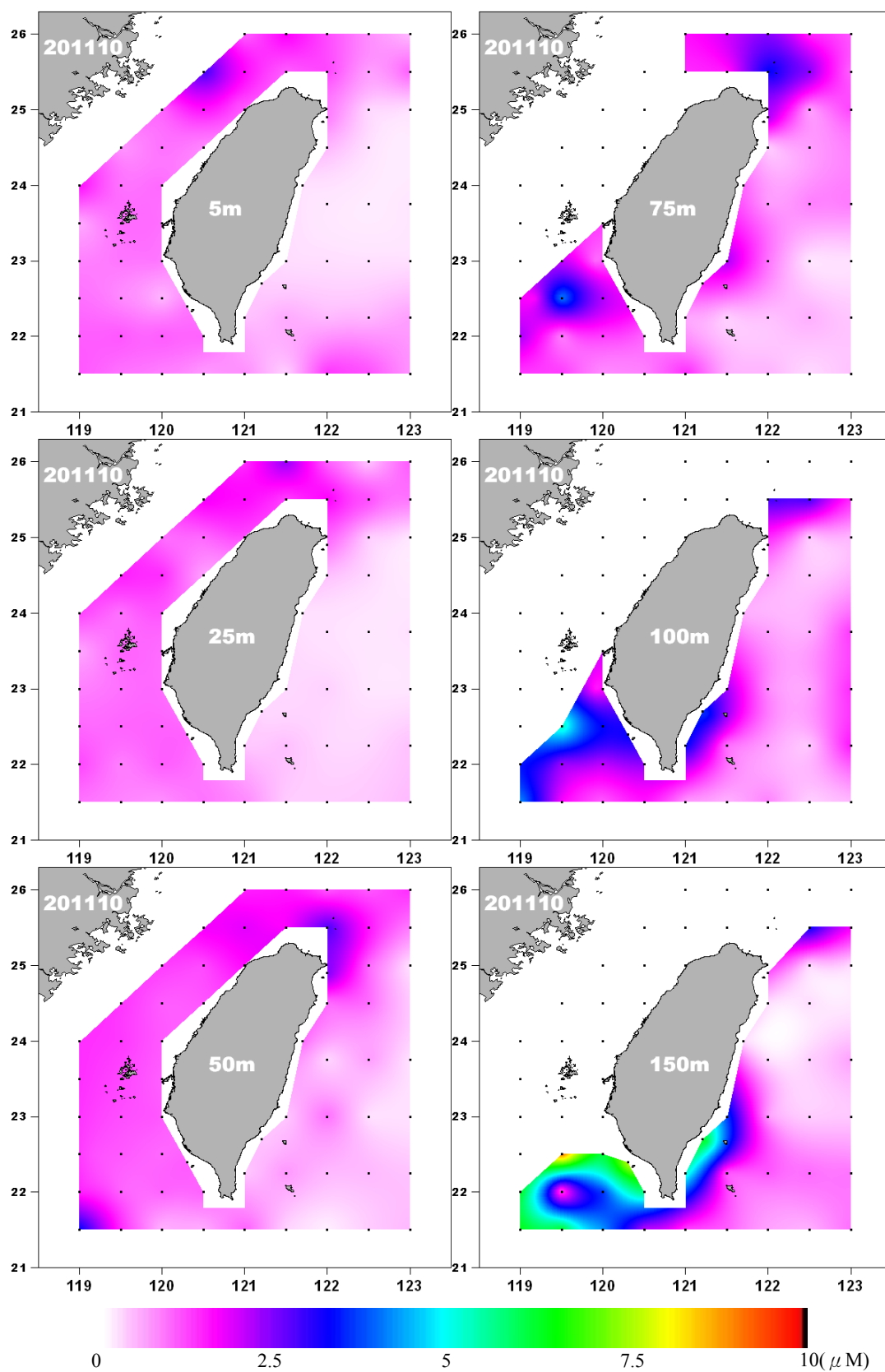


圖 16. 2011-10 航次硝酸鹽(NO_3^-)濃度分布
 Fig. 16. Nitrate (NO_3^-) distribution in Oct. 2011.

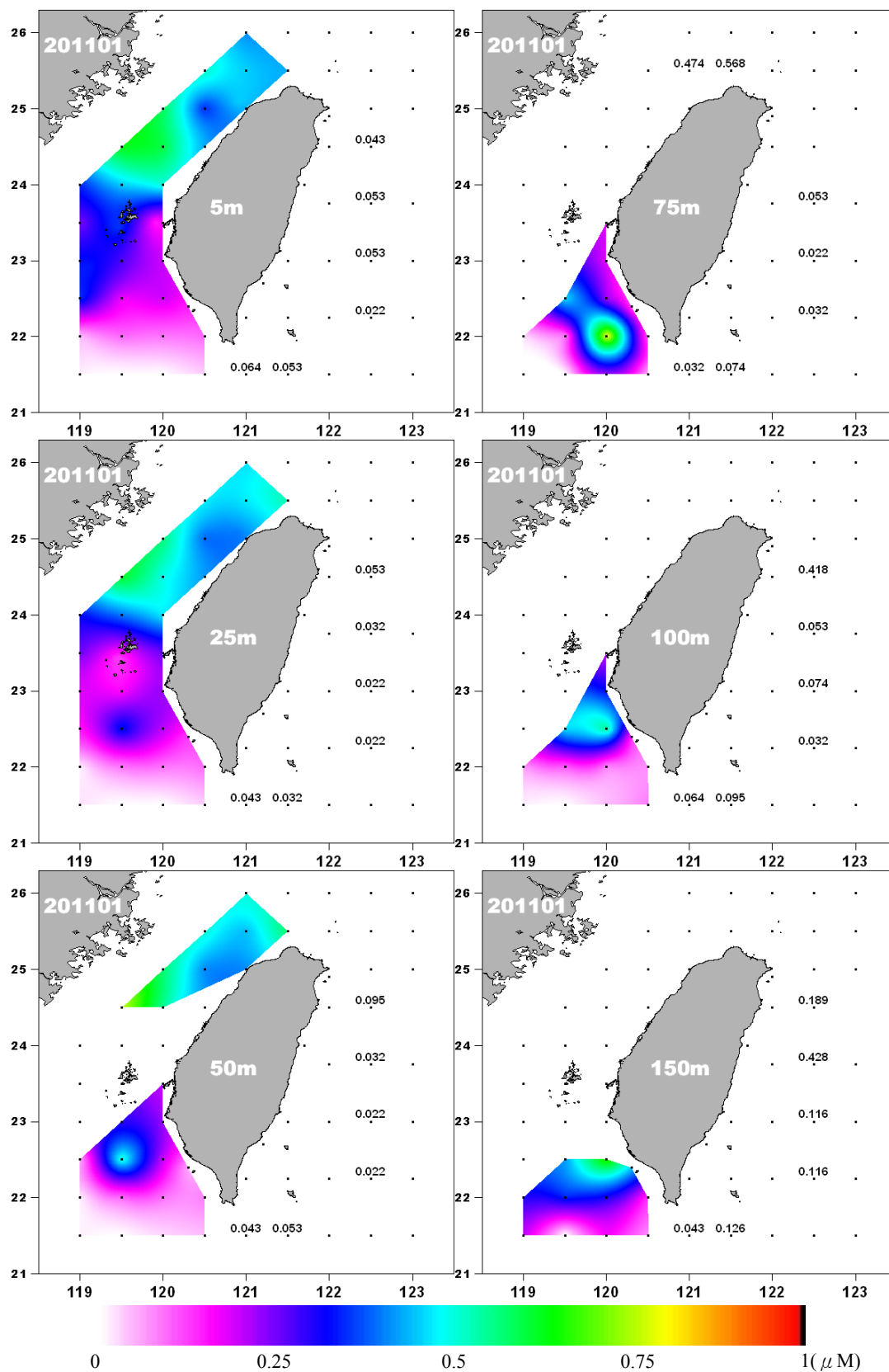


圖 17. 2011-01 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 17. Phosphate (PO_4^{3-}) distribution in Jan. 2011.

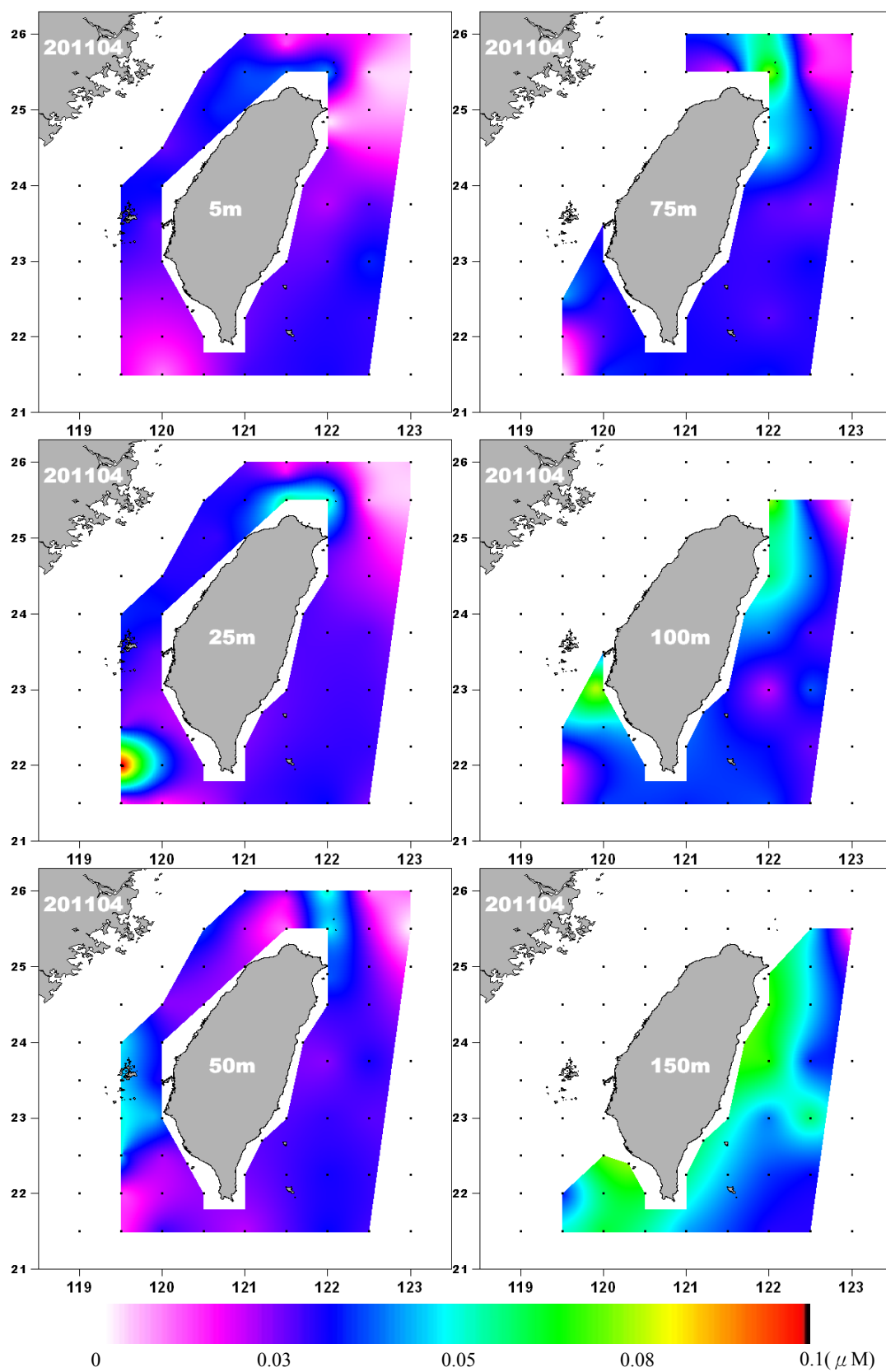


圖 18. 2011-04 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 18. Phosphate (PO_4^{3-}) distribution in Apr. 2011.

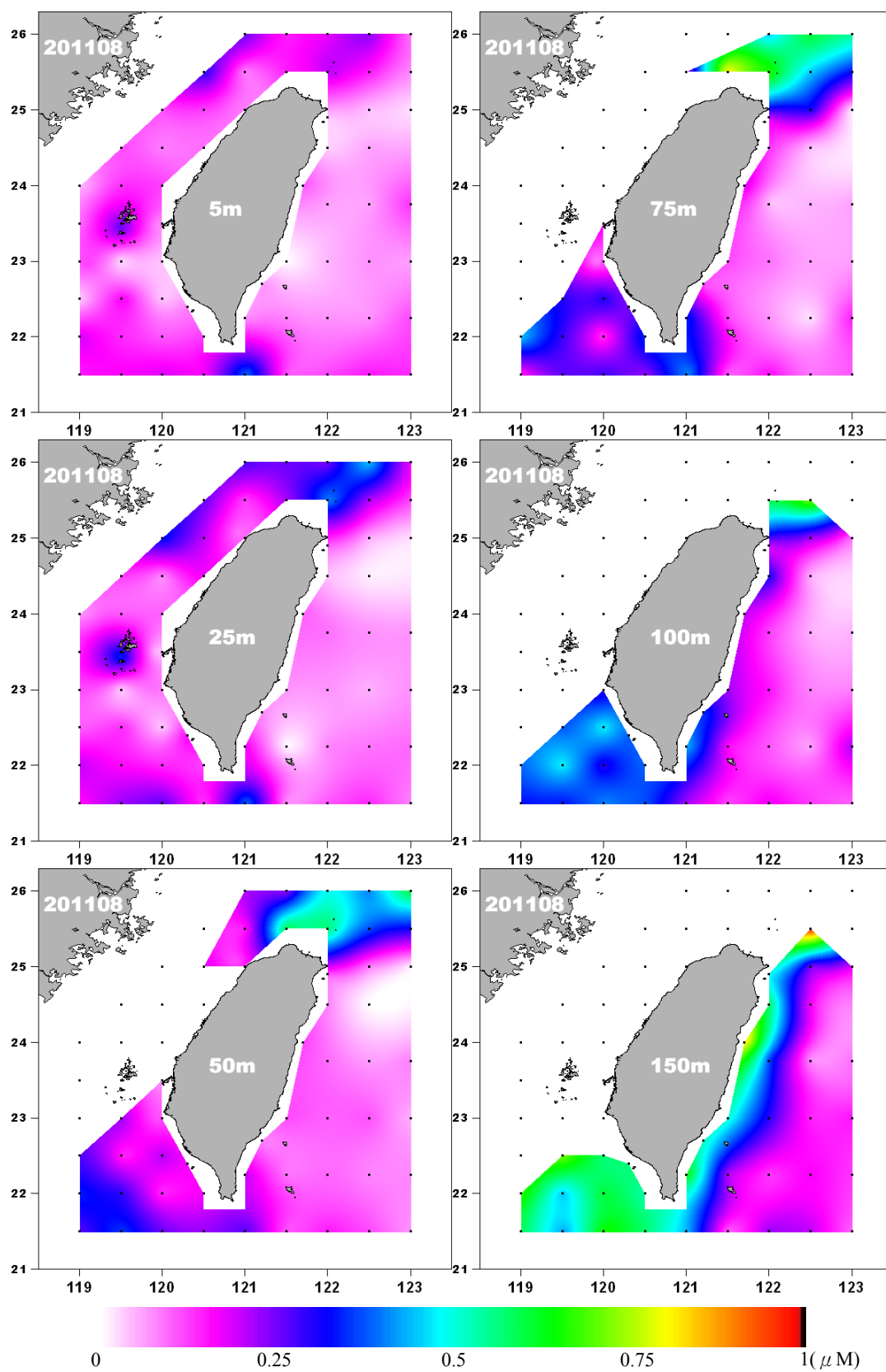


圖 19. 2011-08 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 19. Phosphate (PO_4^{3-}) distribution in Aug. 2011.

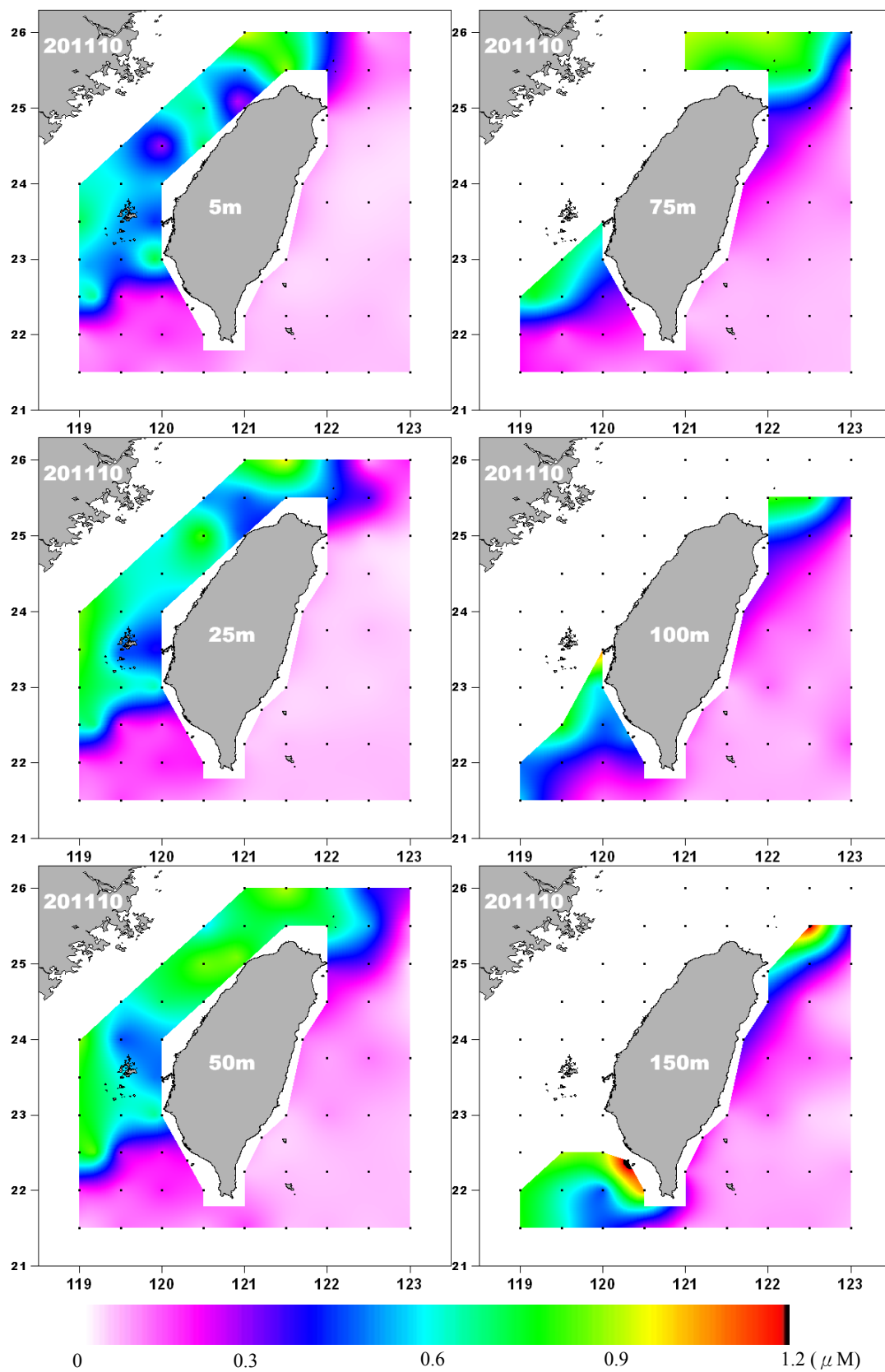


圖 20. 2011-10 航次磷酸鹽(PO_4^{3-})濃度分布
 Fig. 20. Phosphate (PO_4^{3-}) distribution in Oct. 2011.

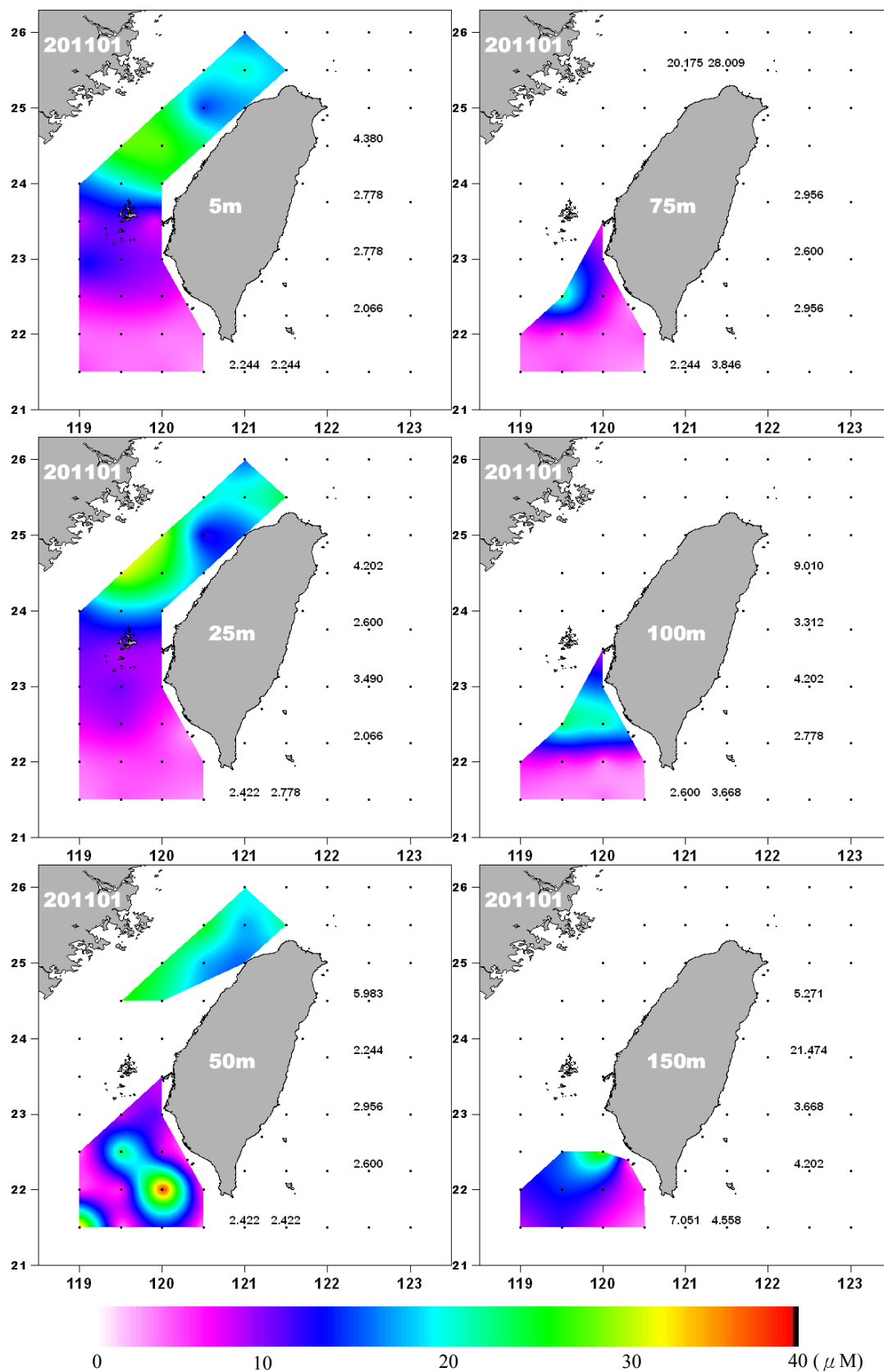


圖 21. 2011-01 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 21. Silicate (SiO_2^{2-}) distribution in Jan. 2011.

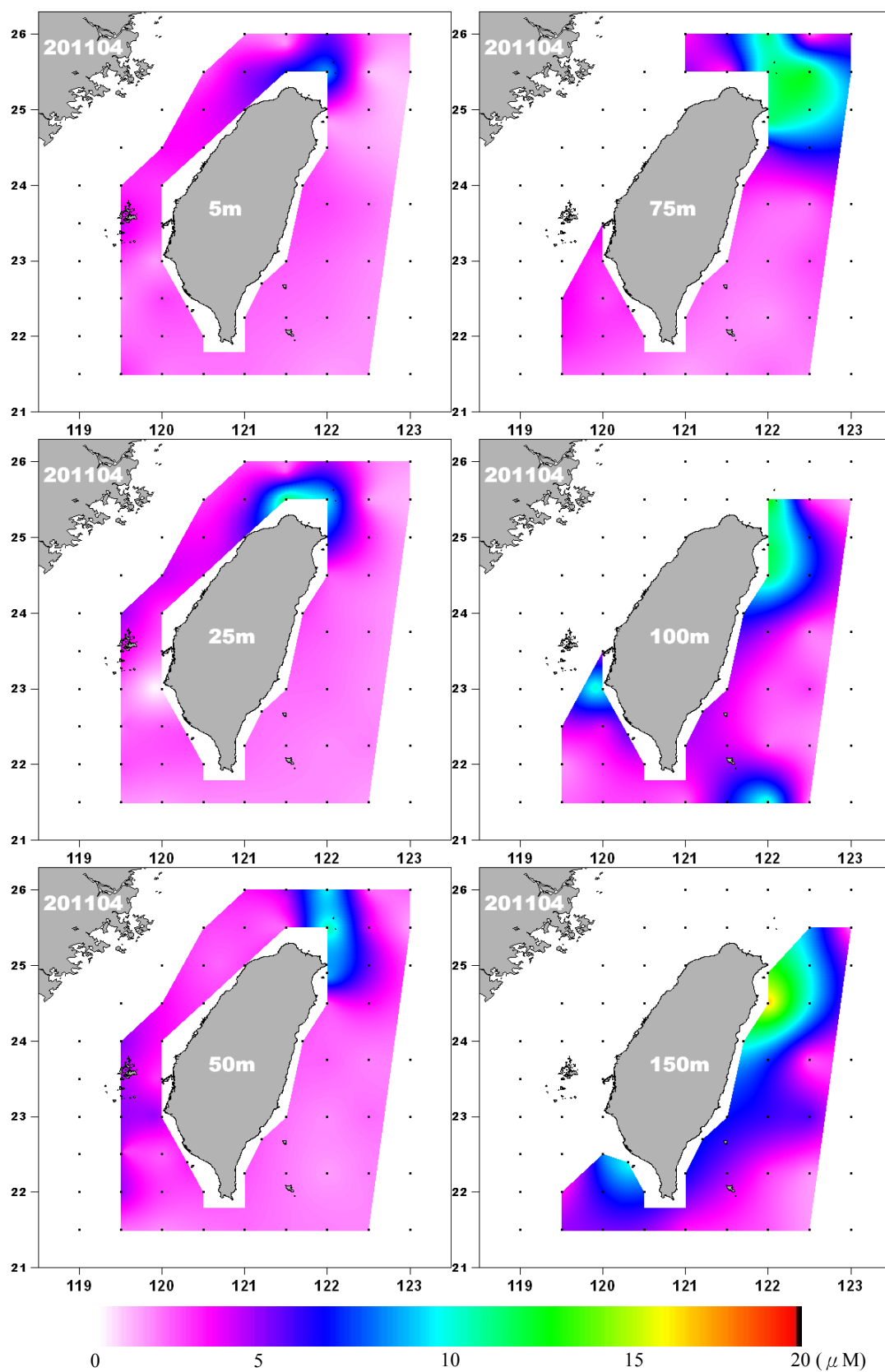


圖 22. 2011-04 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 22. Silicate (SiO_2^{2-}) distribution in Apr. 2011.

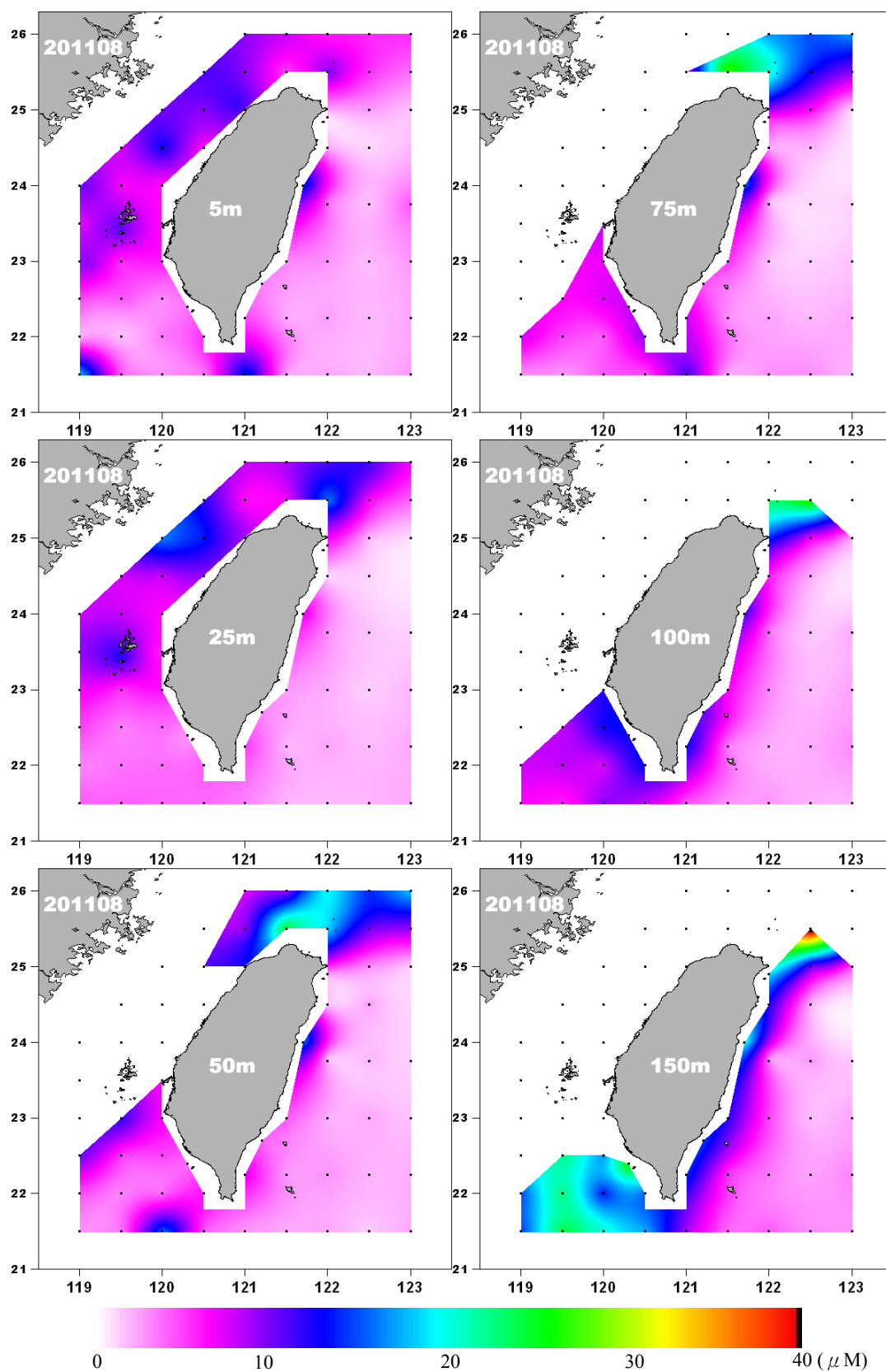


圖 23. 2011-08 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 23. Silicate (SiO_2^{2-}) distribution in Aug. 2011.

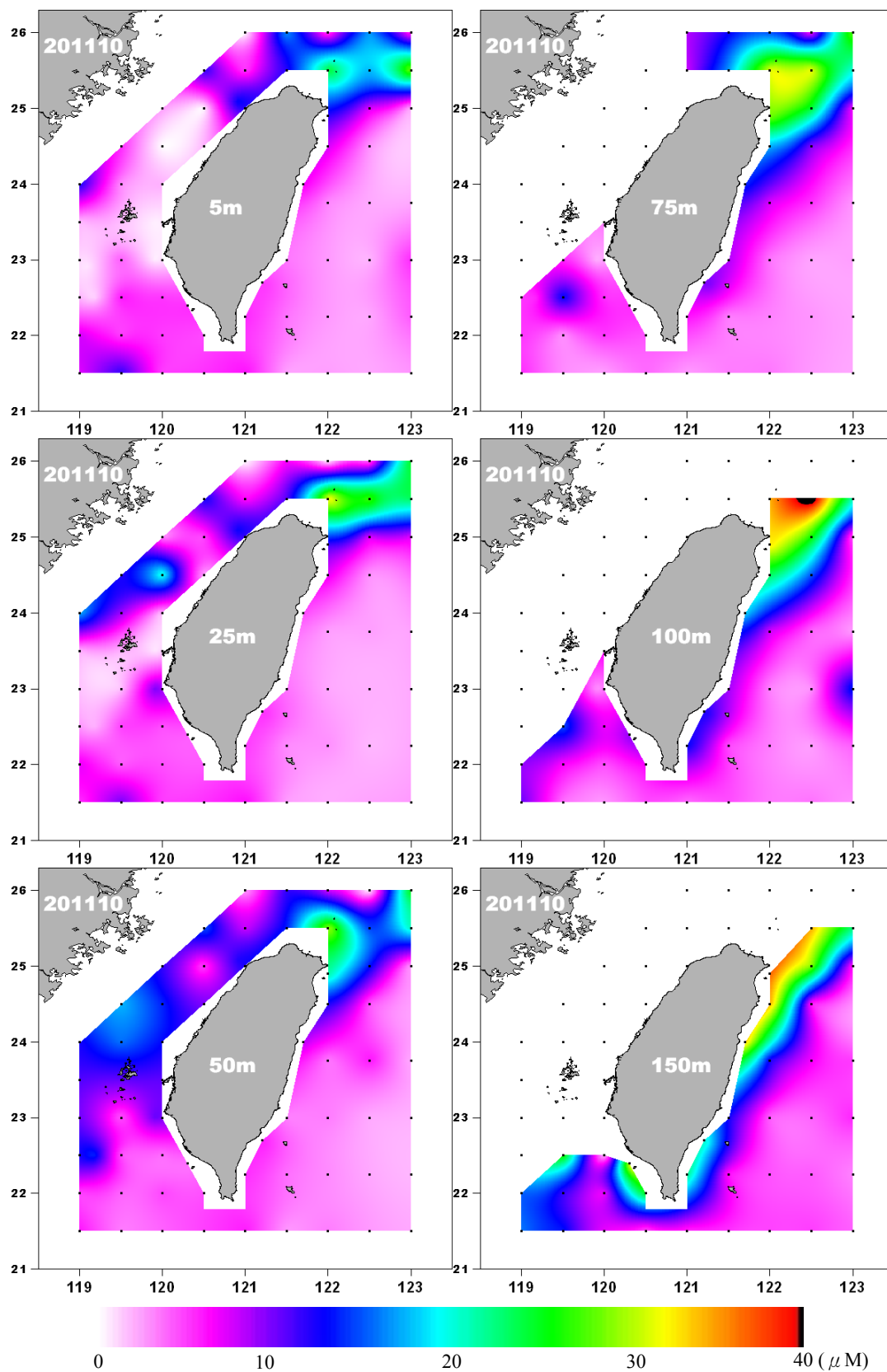


圖 24. 2011-10 航次矽酸鹽(SiO_2^{2-})濃度分布
 Fig. 24. Silicate (SiO_2^{2-}) distribution in Oct. 2011.

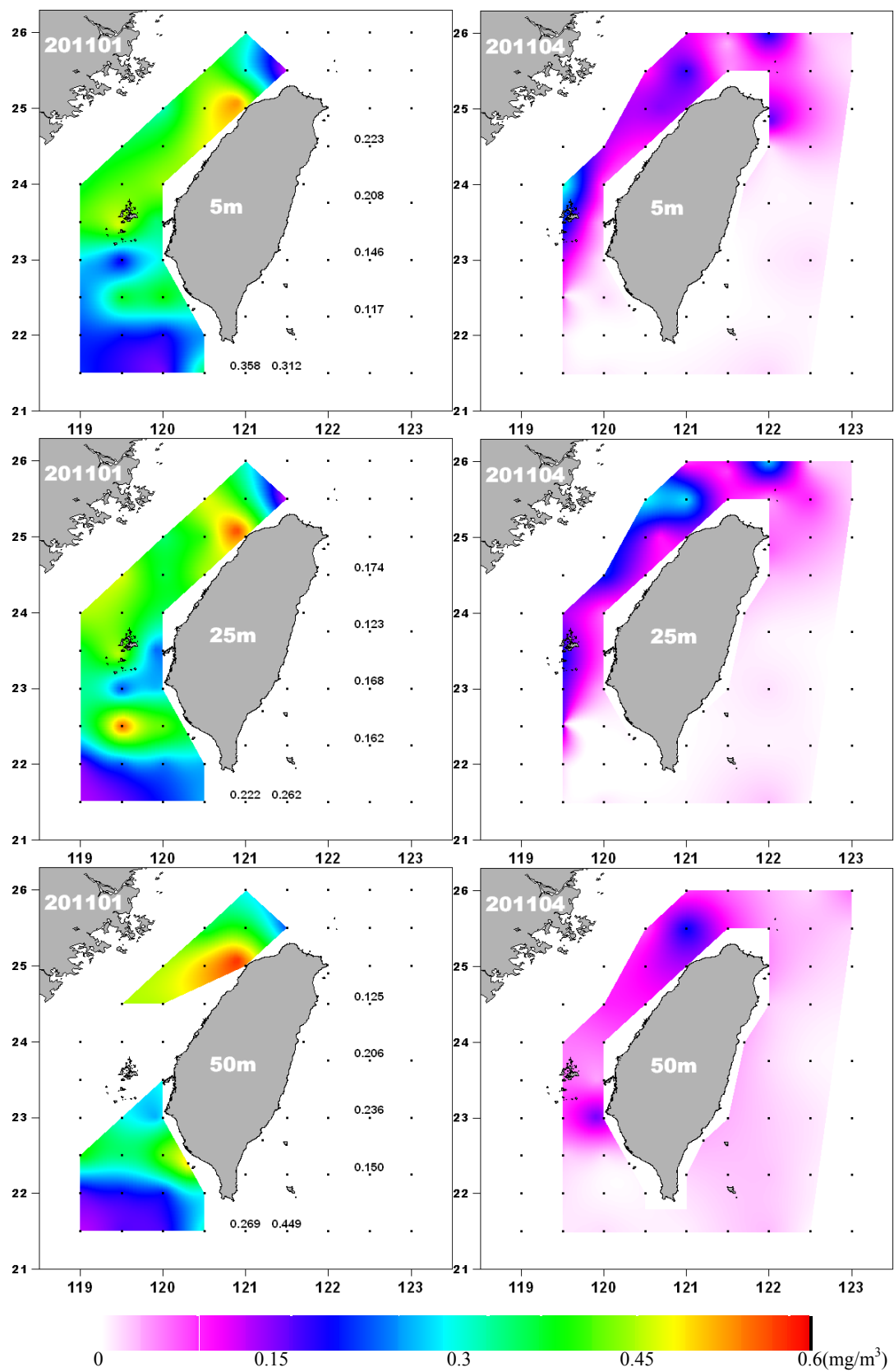


圖 25. 2011 年 1 月及 4 月葉綠素甲(chl-*a*)分布
 Fig. 25. Chlorophyll-*a* (chl-*a*) distribution in Jan. and Apr. 2011.

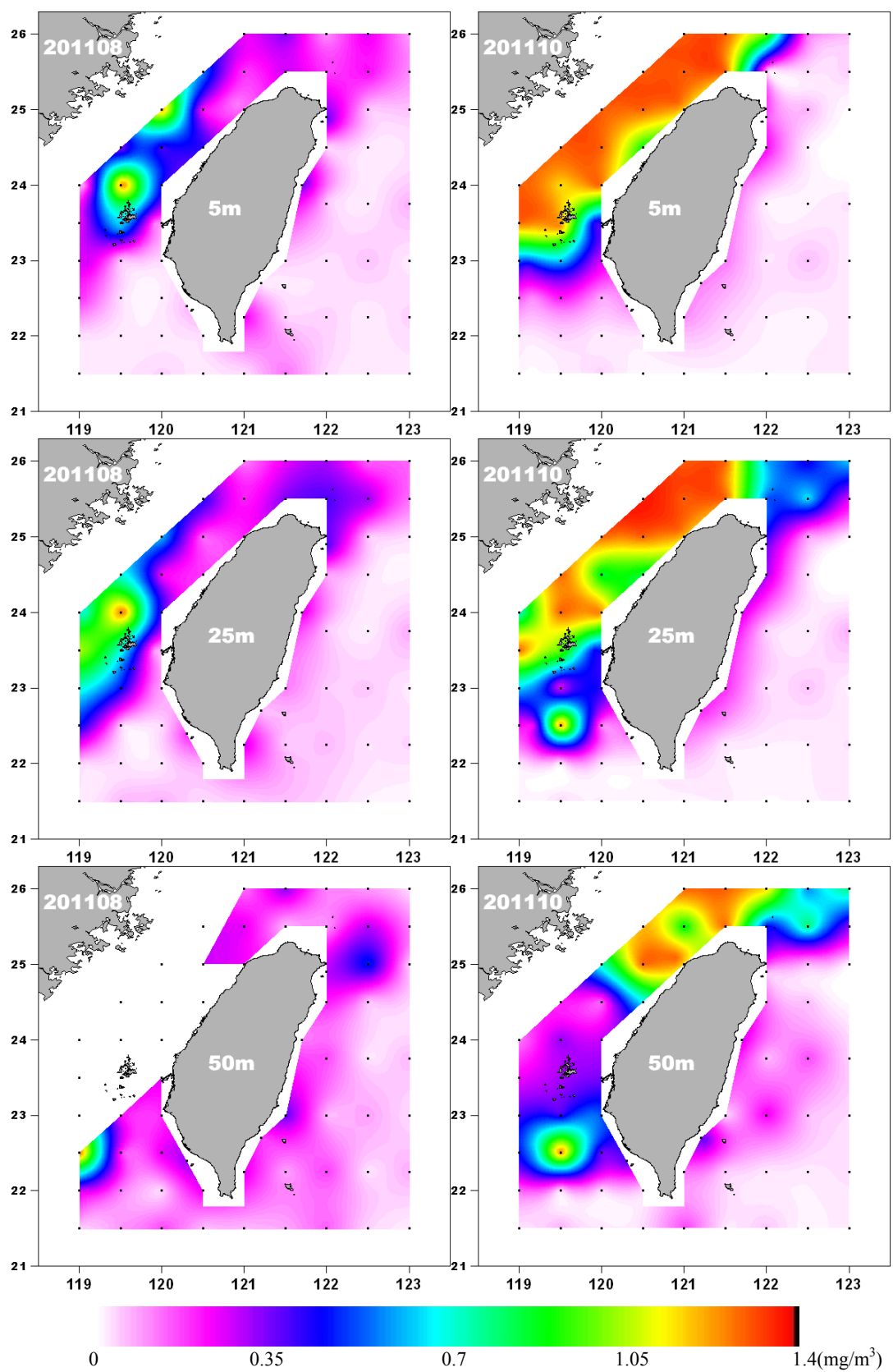


圖 26. 2011 年 8 月及 10 月葉綠素甲(chl-a)分布
 Fig. 26. Chlorophyll-*a* (chl-*a*) distribution in Aug. and Oct. 2011.

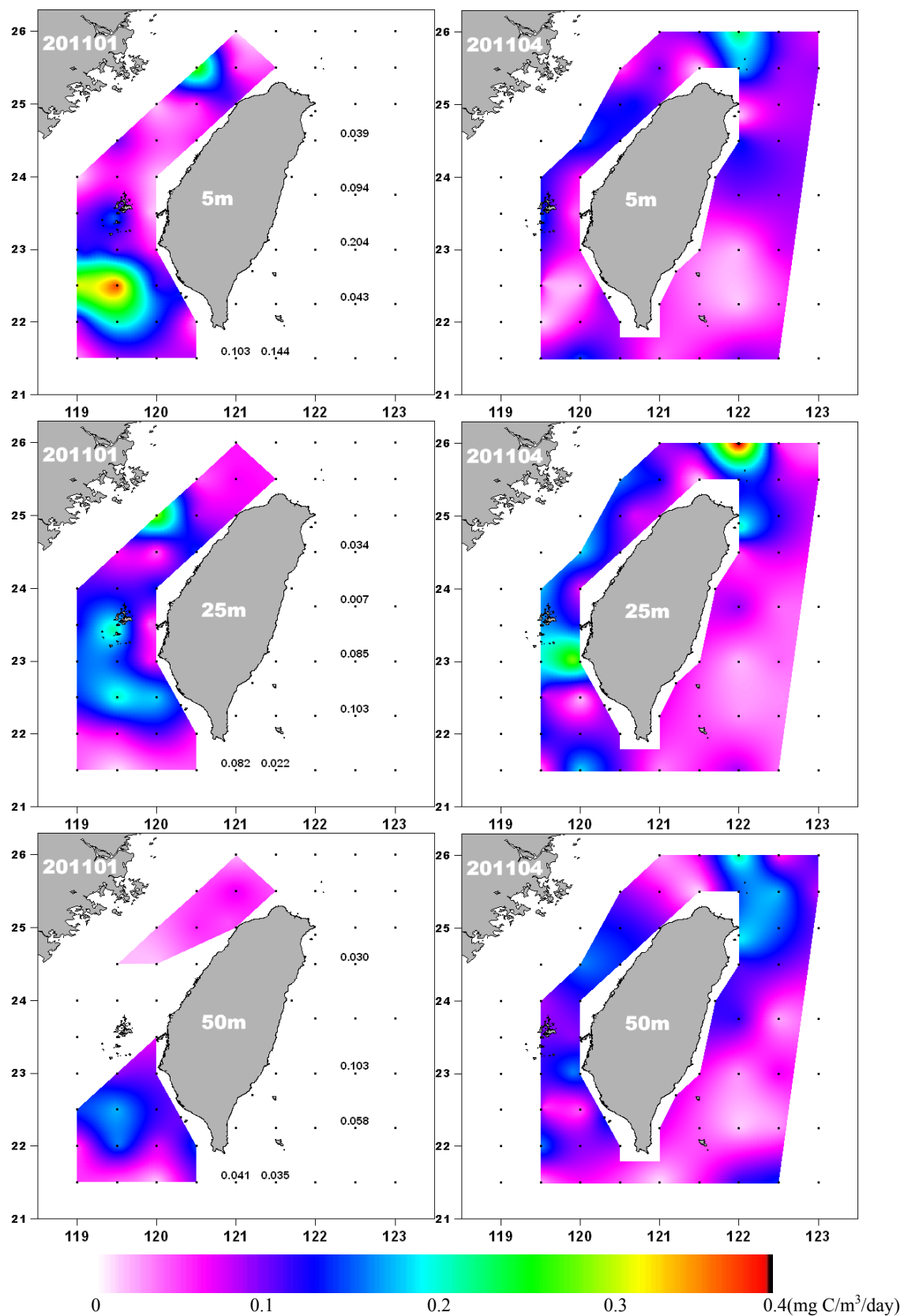


圖 27. 2011 年 1 月及 4 月基礎生產力分布
Fig. 27. Primary production distribution in Jan. and Apr. 2011.

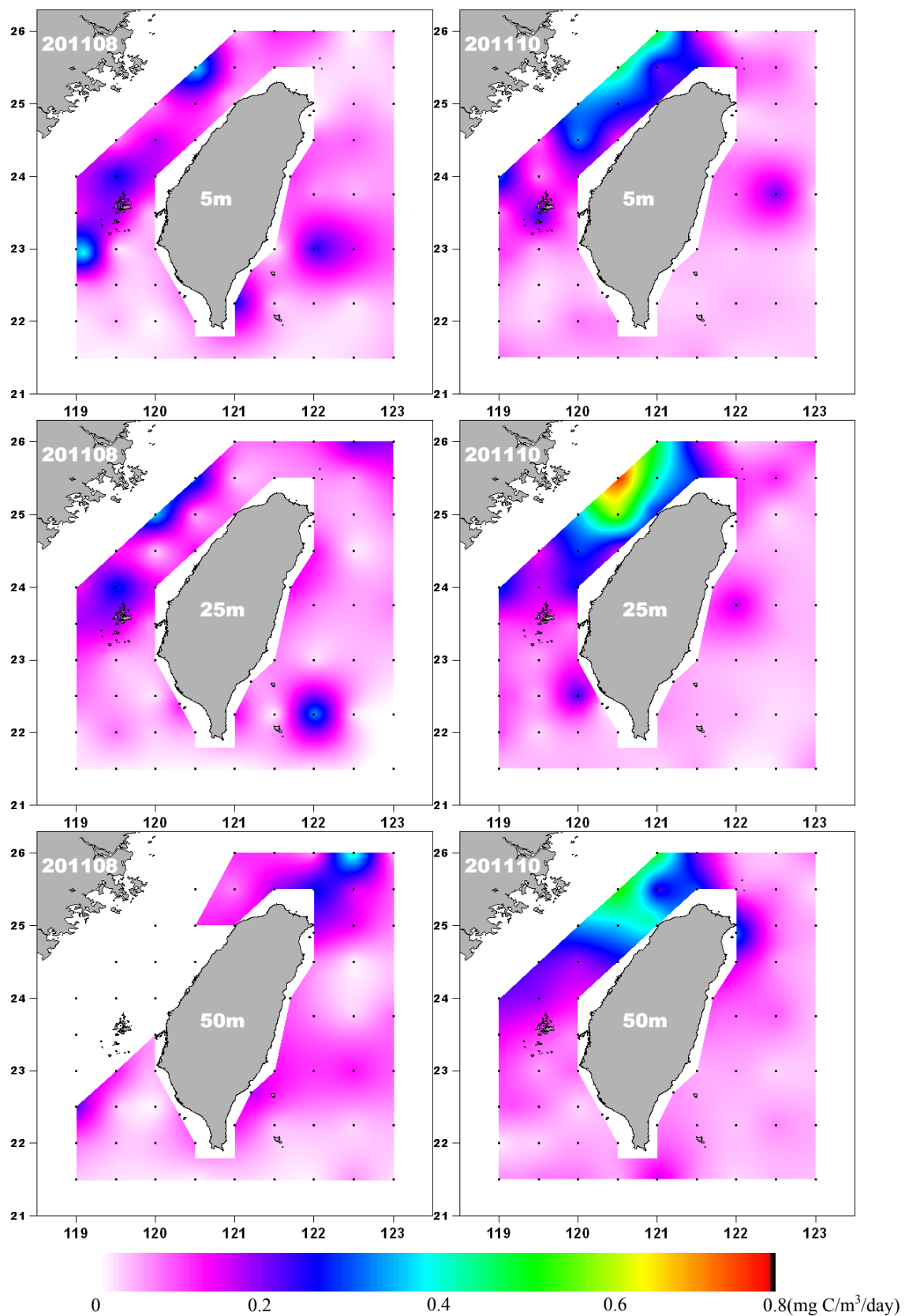


圖 28. 2011 年 8 月及 10 月基礎生產力分布
 Fig. 28. Primary production distribution in Aug. and Oct. 2011.

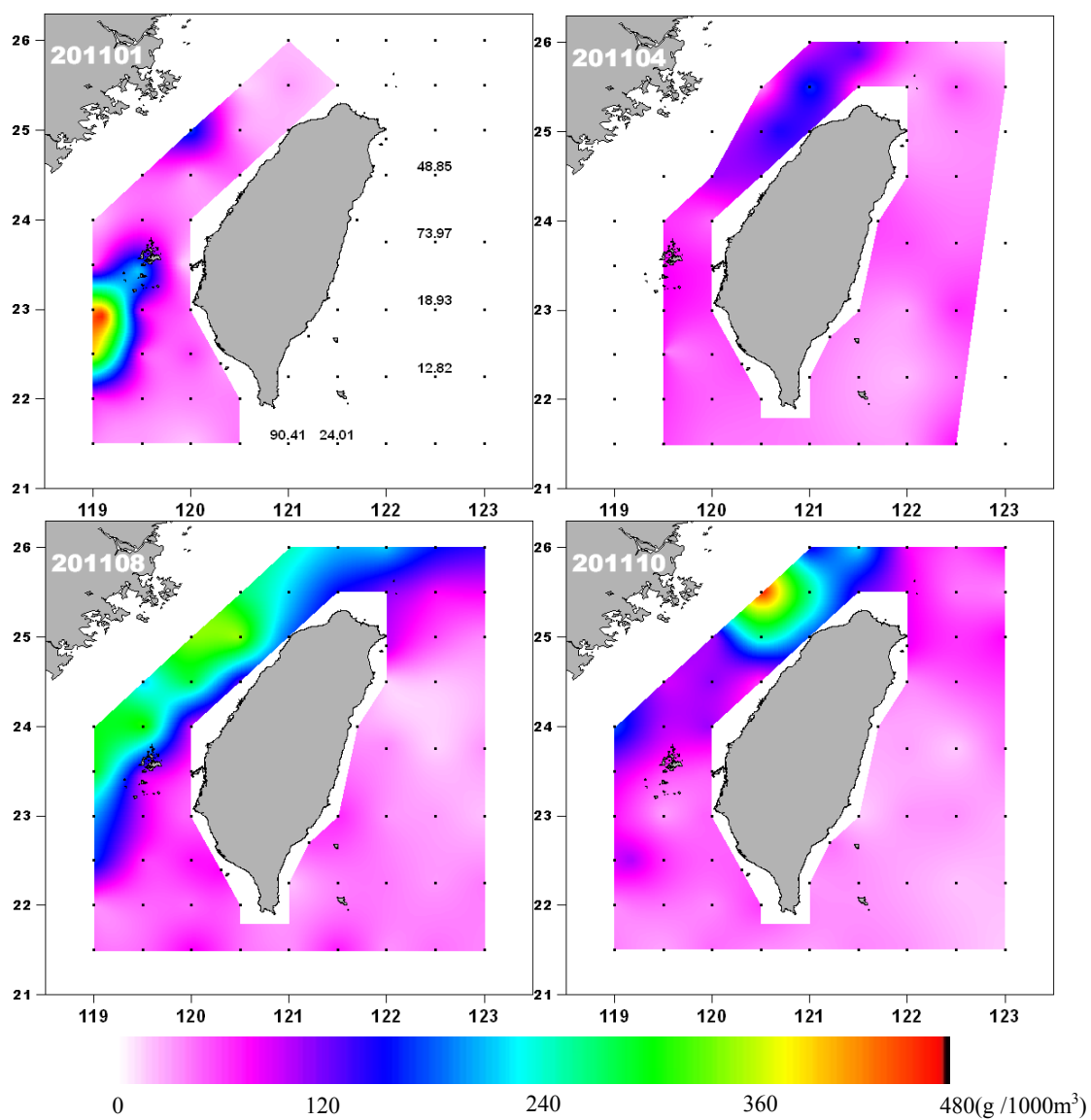


圖 29. 2011 年 1 月、4 月、8 月及 10 月浮游動物生物量分布
 Fig. 29. Biomass of zooplankton sample in 2011.

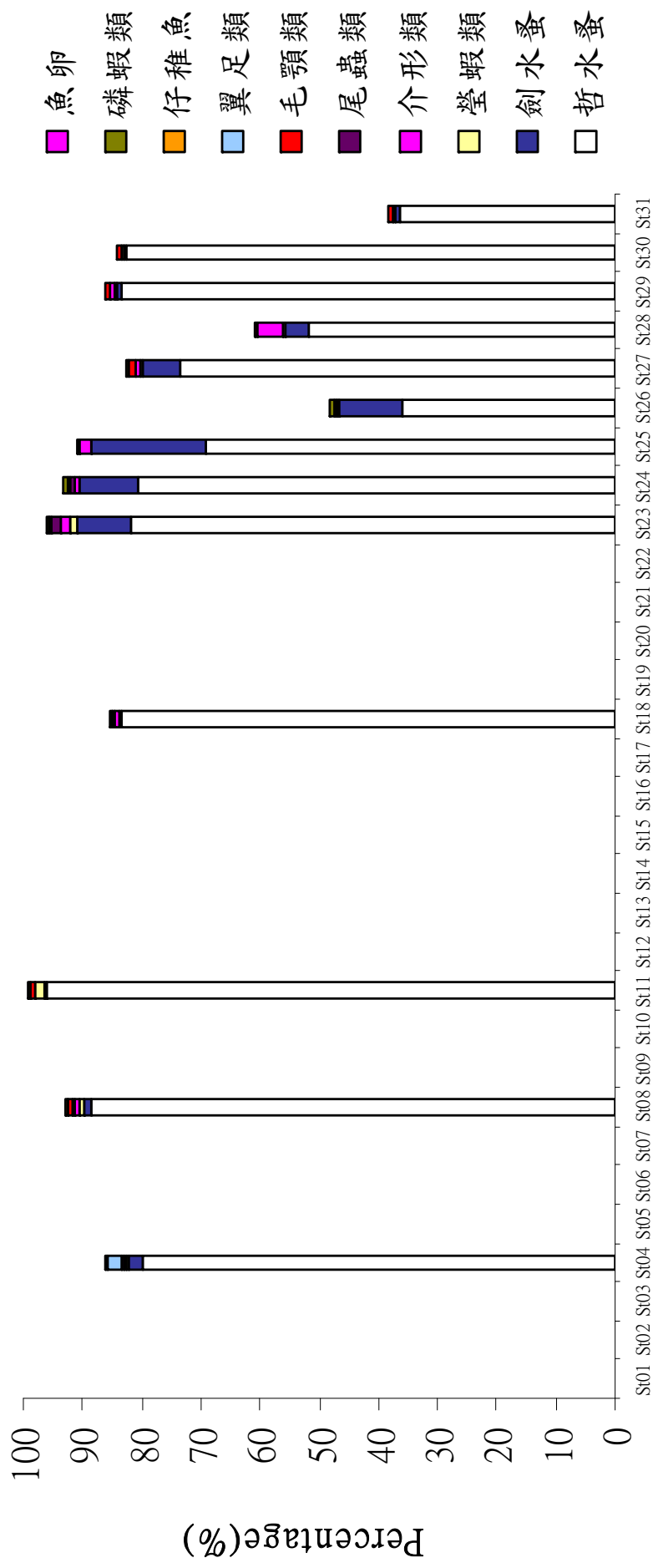


圖 30. 2011-01 航次浮游動物優勢大類出現百分率

Fig. 30. Percentage of the composition of zooplankton in Jan. 2011.

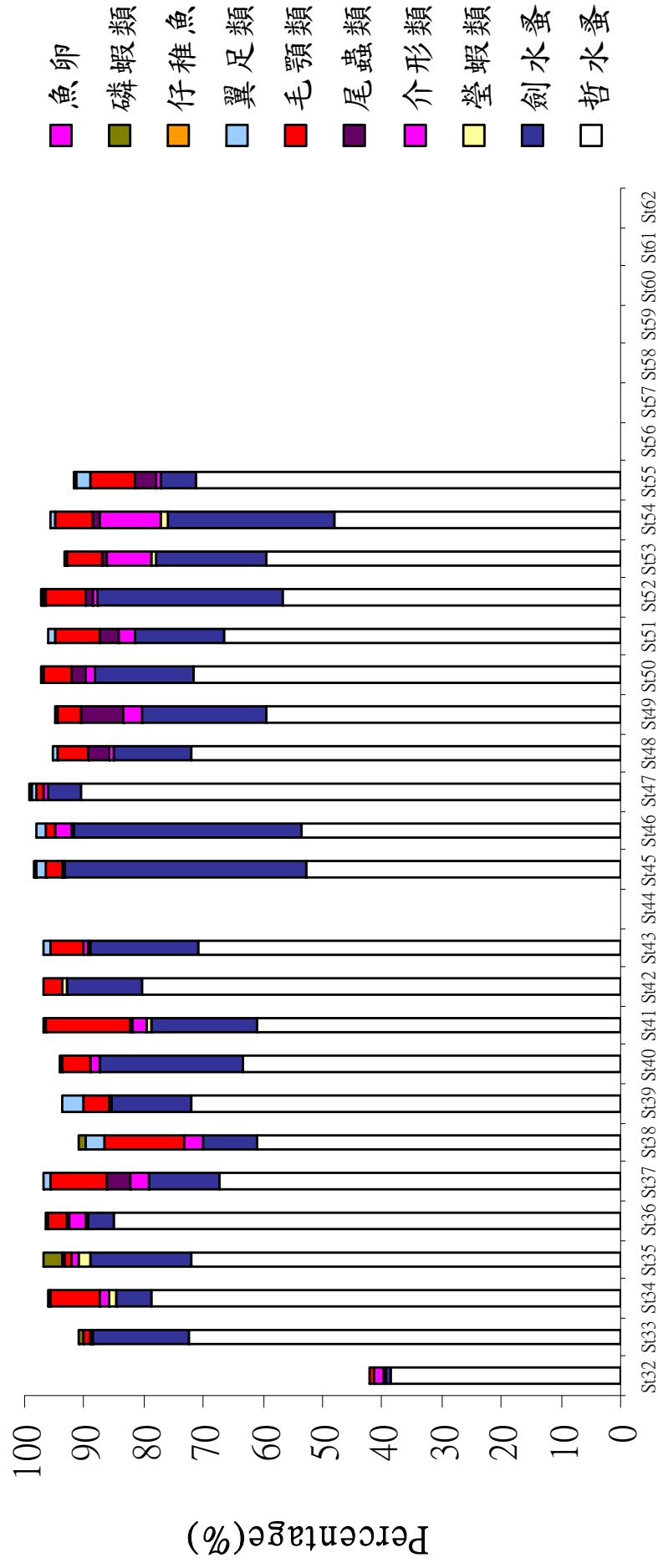


圖 31. 2011-01 航次浮游動物優勢大類出現百分率(續)
Fig. 31. Percentage of the composition of zooplankton in Jan. 2011.

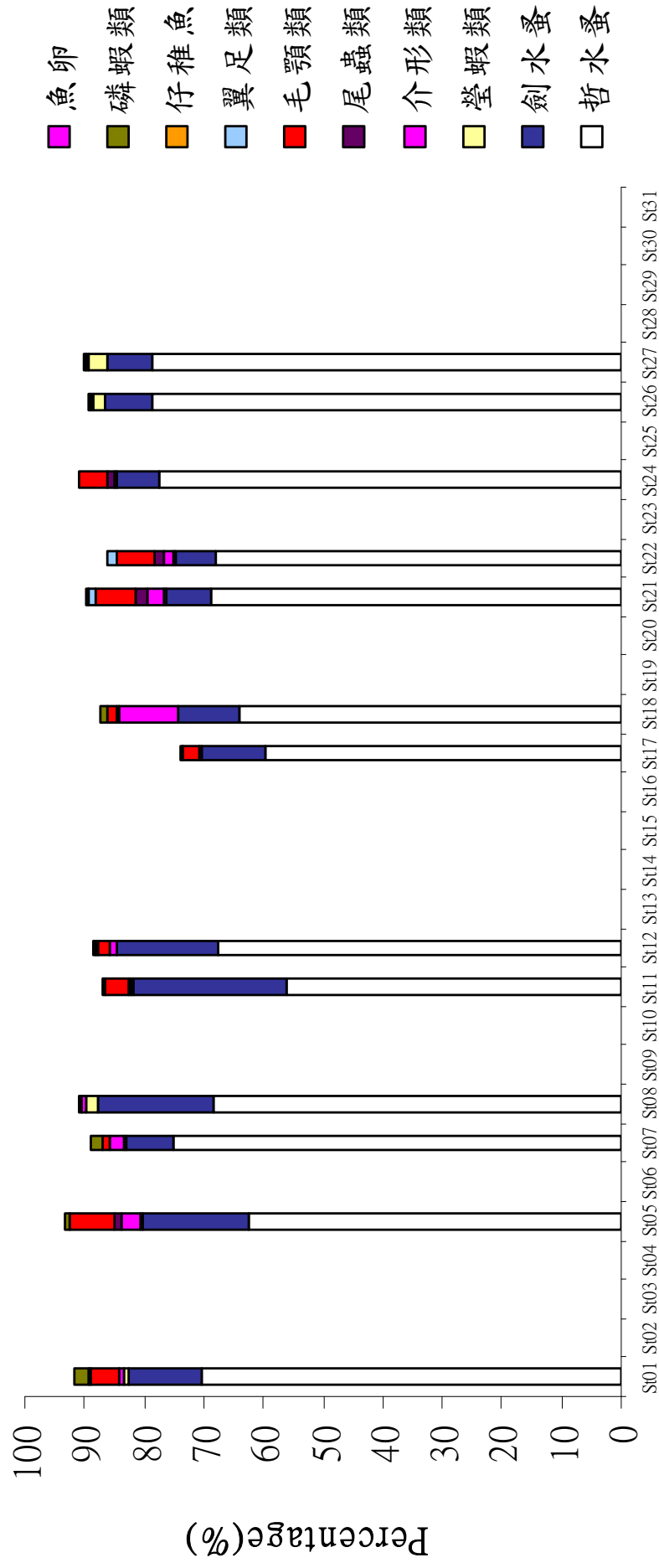


圖 32. 2011-04 航次浮游動物優勢大類出現百分率

Fig. 32. Percentage of the composition of zooplankton in Apr. 2011.

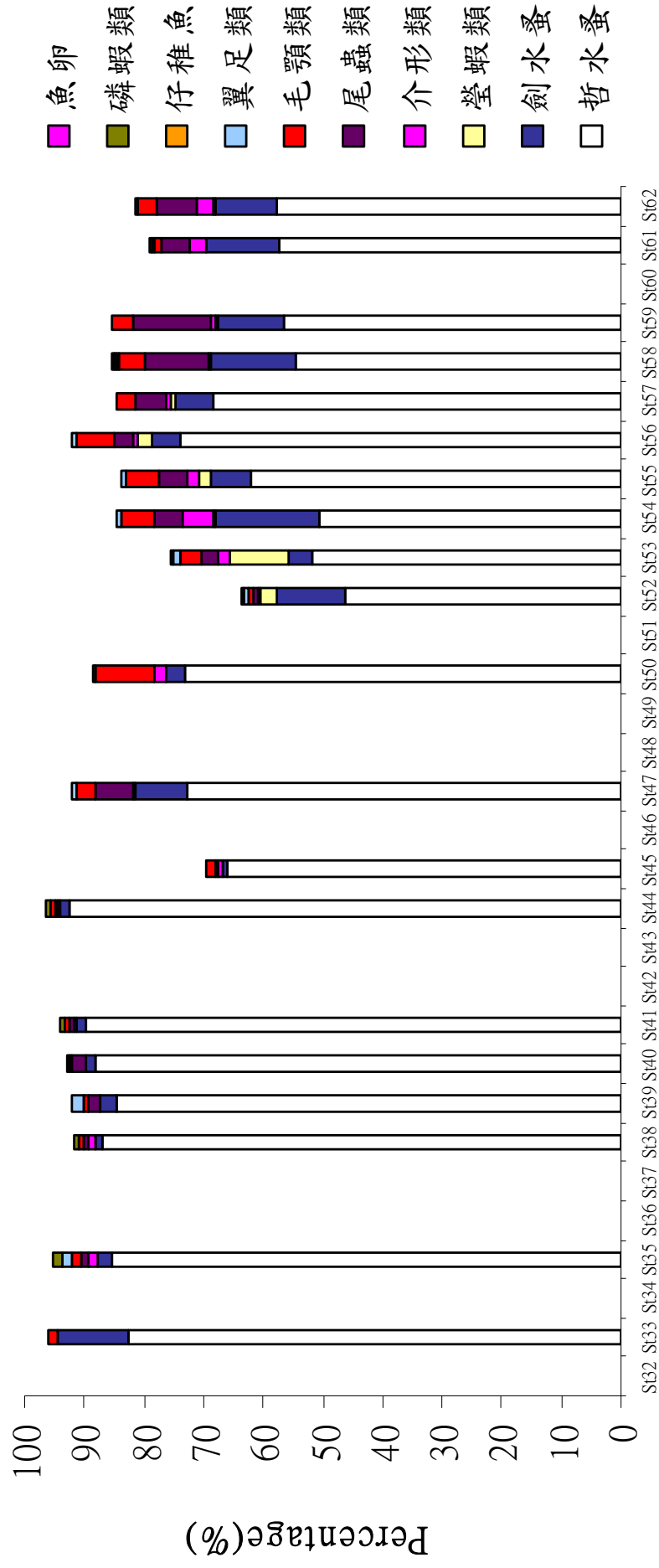


圖 33. 2011-04 航次浮游動物優勢大類出現百分率(續)
Fig. 33. Percentage of the composition of zooplankton in Apr. 2011.

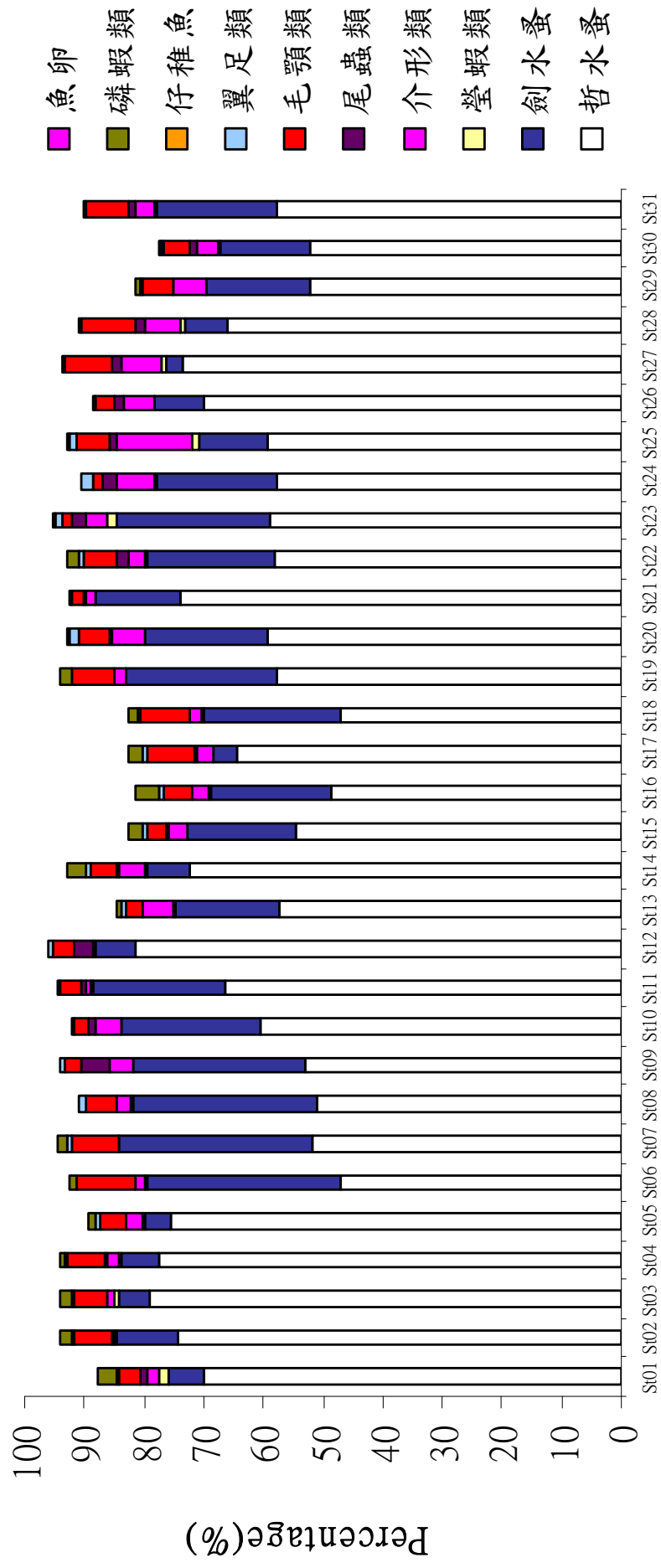


圖 34. 2011-08 航次浮游動物優勢大類出現百分率

Fig. 34. Percentage of the composition of zooplankton in Aug. 2011.

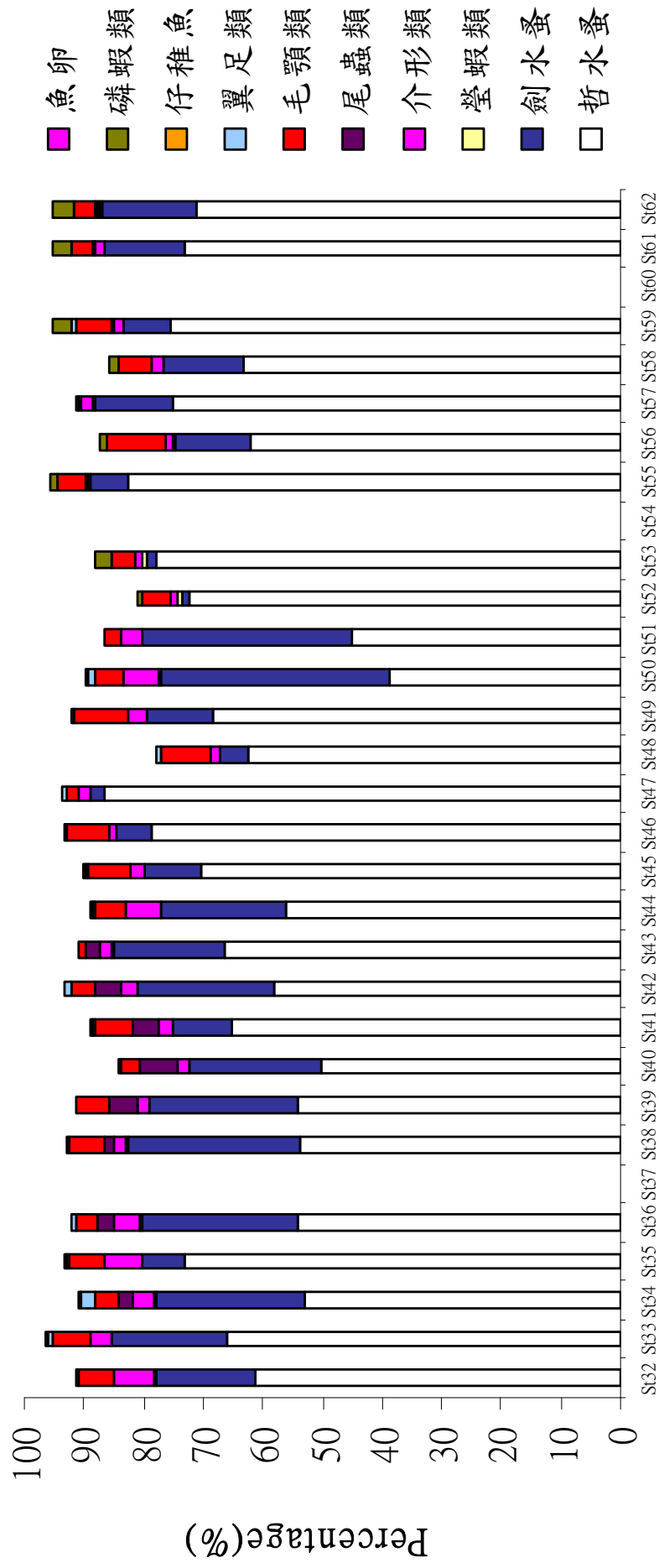


圖 35. 2011-08 航次浮游動物優勢大類出現百分率(續)

Fig. 35. Percentage of the composition of zooplankton in Aug. 2011.

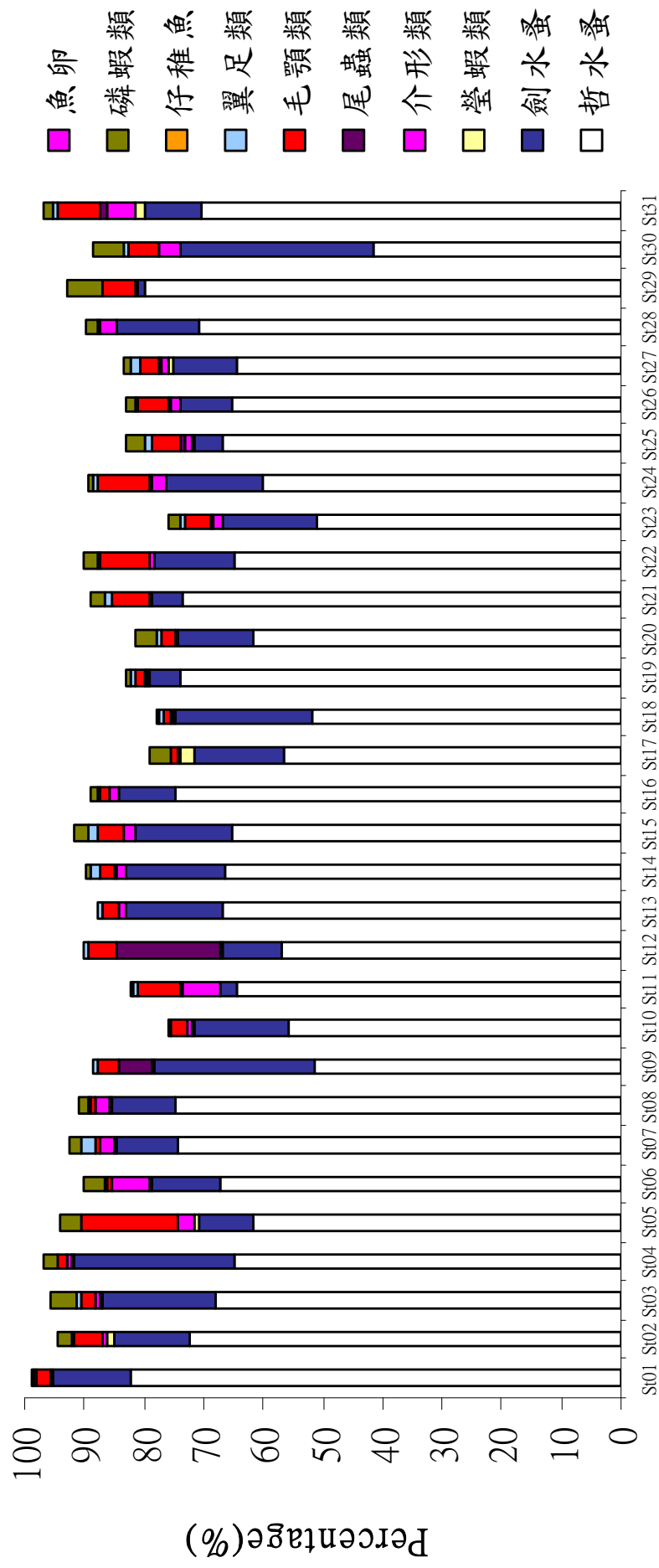


圖 36. 2011-10 航次浮游動物優勢大類出現百分率
Fig. 36. Percentage of the composition of zooplankton in Oct. 2011.

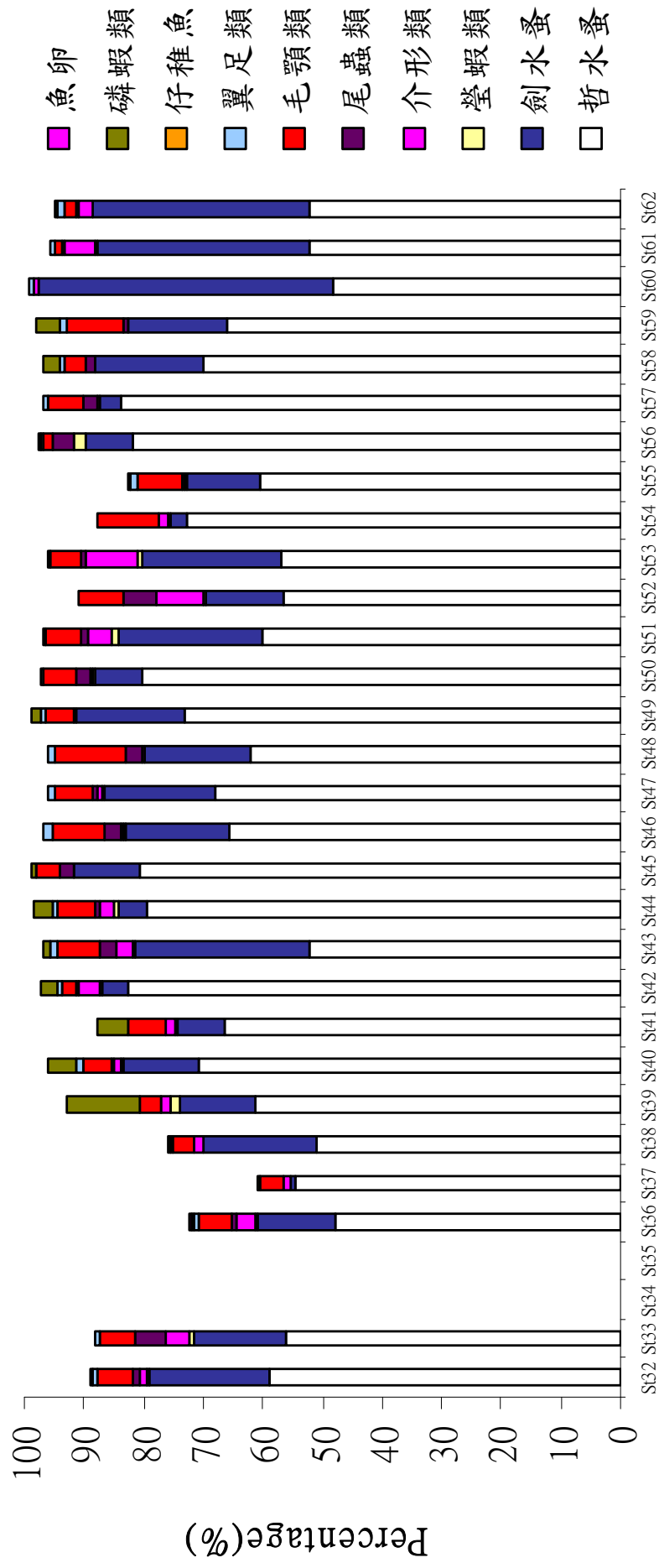


圖 37. 2011-10 航次浮游動物優勢大類出現百分率(續)
Fig. 37. Percentage of the composition of zooplankton in Oct. 2011.

表 01. 2011-01-13 航次基礎觀測資料
Chart 01. Basic observation data in Jan. 2011

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	-	-	-	-	-	-	-	-	-	-	-	-	-
St.02	-	-	-	-	-	-	-	-	-	-	-	-	-
St.03	-	-	-	-	-	-	-	-	-	-	-	-	-
St.04	20110113	2213	24.50	122.50	600	23.3	21.0	1014.11	189	5.0	200	1392	835.2
St.05	-	-	-	-	-	-	-	-	-	-	-	-	-
St.06	-	-	-	-	-	-	-	-	-	-	-	-	-
St.07	-	-	-	-	-	-	-	-	-	-	-	-	-
St.08	20110114	0357	23.77	122.49	3493	23.0	20.7	1014.16	327	2.0	200	1575	945.0
St.09	-	-	-	-	-	-	-	-	-	-	-	-	-
St.10	-	-	-	-	-	-	-	-	-	-	-	-	-
St.11	20110114	0949	23.02	122.50	5516	24.6	23.2	1013.81	122	7.3	200	1074	644.4
St.12	-	-	-	-	-	-	-	-	-	-	-	-	-
St.13	-	-	-	-	-	-	-	-	-	-	-	-	-
St.14	-	-	-	-	-	-	-	-	-	-	-	-	-
St.15	-	-	-	-	-	-	-	-	-	-	-	-	-
St.16	-	-	-	-	-	-	-	-	-	-	-	-	-
St.17	-	-	-	-	-	-	-	-	-	-	-	-	-
St.18	20110114	1525	22.27	122.51	4823	25.5	22.9	1010.42	094	7.4	200	1356	813.6
St.19	-	-	-	-	-	-	-	-	-	-	-	-	-
St.20	-	-	-	-	-	-	-	-	-	-	-	-	-
St.21	-	-	-	-	-	-	-	-	-	-	-	-	-
St.22	-	-	-	-	-	-	-	-	-	-	-	-	-
St.23	20110114	2325	21.51	121.51	2055	25.4	21.9	1010.78	055	7.2	200	1475	885.0
St.24	20110115	0305	21.51	121.01	1081	24.7	21.0	1009.71	008	12.4	200	518	310.8
St.25	20110115	0632	21.51	120.50	1774	24.4	21.5	1012.20	018	8.2	200	1138	682.8
St.26	20110117	1420	21.51	120.01	2958	24.5	19.1	1016.03	062	15.5	200	1185	711.0
St.27	20110117	1744	21.51	119.50	2983	23.6	18.4	1018.43	026	9.0	200	1181	708.6
St.28	20110117	2048	21.50	119.00	2761	23.2	18.1	1019.32	033	11.3	200	1385	831.0
St.29	20110118	0042	22.00	119.00	1422	22.4	17.0	1018.08	019	11.8	200	1532	919.2
St.30	20110118	0400	22.01	119.52	2434	22.4	17.3	1017.19	022	10.4	200	1439	863.4
St.31	20110118	0700	22.01	120.01	1173	23.0	18.3	1018.61	030	5.7	200	1077	646.2
St.32	20110117	1010	22.00	120.51	400	22.5	17.8	1020.93	054	12.3	200	1129	677.4
St.33	20130118	1016	22.38	120.33	512	23.1	18.2	1018.79	026	6.4	200	1317	790.2
St.34	20110118	1233	22.50	120.01	671	22.5	18.0	1016.65	335	10.7	200	1157	694.2
St.35	20110118	1533	22.50	119.50	230	21.8	18.2	1015.76	011	8.3	200	1098	658.8
St.36	20110118	1822	22.51	119.01	81	21.1	17.0	1016.12	023	15.2	80	525	315.0
St.37	20110118	2112	22.94	119.10	26	20.3	16.0	1017.54	032	13.6	15	70	42.0
St.38	20110118	2333	22.98	119.49	76	20.1	16.0	1017.19	028	12.6	70	342	205.2
St.39	20110119	0200	23.00	119.92	126	21.4	17.5	1015.76	022	11.9	110	692	415.2
St.40	20110119	0543	23.51	119.91	116	20.4	15.1	1016.30	017	15.9	100	730	438.0
St.41	20110119	0805	23.44	119.47	53	18.7	15.1	1017.01	358	9.6	48	246	147.6
St.42	20110119	1043	23.50	119.00	54	17.9	13.4	1017.19	012	13.2	40	419	251.4
St.43	20110119	1600	24.00	119.00	56	16.5	12.0	1014.52	036	15.9	30	481	288.6
St.44	-	-	-	-	-	-	-	-	-	-	-	-	-
St.45	20110122	1248	23.99	120.01	42	18.1	15.5	1016.30	027	12.4	35	320	192.0
St.46	20110122	1841	24.50	120.50	50	18.0	16.0	1017.90	019	8.5	45	307	184.2
St.47	20110122	2126	24.50	120.01	60	16.2	11.6	1019.50	011	14.8	50	254	152.4
St.48	20110123	0008	24.50	119.50	68	14.8	10.0	1019.50	027	15.4	58	449	269.4
St.49	20110123	0527	25.00	120.00	51	14.6	10.5	1020.75	015	13.1	45	276	165.6
St.50	20110123	0827	25.01	120.49	75	15.9	12.4	1020.93	010	11.2	70	477	286.2
St.51	20110123	1117	25.08	120.90	74	16.7	12.0	1019.86	359	11.9	60	406	243.6
St.52	20110123	1452	25.50	120.52	67	16.7	12.3	1019.32	030	11.7	60	580	348.0
St.53	20110123	1953	26.01	120.98	74	16.7	12.0	1022.71	028	14.8	50	570	342.0
St.54	20110123	2304	25.51	121.00	90	16.7	12.3	1022.17	028	13.9	85	590	354.0
St.55	20130124	0202	25.50	121.50	114	16.5	12.3	1021.99	022	13.2	105	721	432.6
St.56	-	-	-	-	-	-	-	-	-	-	-	-	-
St.57	-	-	-	-	-	-	-	-	-	-	-	-	-
St.58	-	-	-	-	-	-	-	-	-	-	-	-	-
St.59	-	-	-	-	-	-	-	-	-	-	-	-	-
St.60	-	-	-	-	-	-	-	-	-	-	-	-	-
St.61	-	-	-	-	-	-	-	-	-	-	-	-	-
St.62	-	-	-	-	-	-	-	-	-	-	-	-	-

表 02. 2011-04-21 航次基礎觀測資料
Chart 02. Basic observation data in Apr. 2011

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	20110421	1402	24.84	122.01	300	23.8	22.4	1012.20	174	13.3	200	1307	784.2
St.02	-	-	-	-	-	-	-	-	-	-	-	-	-
St.03	-	-	-	-	-	-	-	-	-	-	-	-	-
St.04	-	-	-	-	-	-	-	-	-	-	-	-	-
St.05	20110421	1709	24.50	122.01	350	25.6	22.6	1012.03	190	6.7	200	943	565.8
St.06	-	-	-	-	-	-	-	-	-	-	-	-	-
St.07	20110421	2233	23.75	122.00	3413	25.4	23.0	1012.92	172	3.1	200	1389	833.4
St.08	20110422	0152	23.76	122.49	3195	24.9	21.2	1010.96	277	4.0	200	1433	859.8
St.09	-	-	-	-	-	-	-	-	-	-	-	-	-
St.10	-	-	-	-	-	-	-	-	-	-	-	-	-
St.11	20110422	0712	23.01	122.50	5507	26.1	24.4	1010.60	181	7.0	200	1035	621.0
St.12	20110422	1032	23.00	121.99	4887	26.3	23.3	1010.42	215	3.0	200	1334	800.4
St.13	-	-	-	-	-	-	-	-	-	-	-	-	-
St.14	-	-	-	-	-	-	-	-	-	-	-	-	-
St.15	-	-	-	-	-	-	-	-	-	-	-	-	-
St.16	-	-	-	-	-	-	-	-	-	-	-	-	-
St.17	20110422	1615	22.26	122.01	4595	27.1	24.4	1007.58	169	8.9	200	1348	808.8
St.18	20110422	1902	22.25	122.50	4850	26.0	24.2	1008.64	170	6.7	200	1156	693.6
St.19	-	-	-	-	-	-	-	-	-	-	-	-	-
St.20	-	-	-	-	-	-	-	-	-	-	-	-	-
St.21	20110423	0025	21.50	122.51	4788	26.3	24.7	1008.47	170	11.6	200	1034	620.4
St.22	20110423	0336	21.48	122.00	3448	25.5	22.8	1008.11	270	5.0	200	1669	1001.4
St.23	-	-	-	-	-	-	-	-	-	-	-	-	-
St.24	20110423	0925	21.51	121.00	1264	26.0	23.0	1010.78	026	14.0	200	711	426.6
St.25	-	-	-	-	-	-	-	-	-	-	-	-	-
St.26	20110423	1431	21.50	119.99	2964	26.0	23.1	1009.18	070	12.0	200	1302	781.2
St.27	20110423	1719	21.51	119.49	2959	25.9	21.7	1010.42	290	5.6	200	1154	692.4
St.28	-	-	-	-	-	-	-	-	-	-	-	-	-
St.29	-	-	-	-	-	-	-	-	-	-	-	-	-
St.30	20110423	2045	21.99	119.51	2384	25.7	23.1	1012.38	138	3.7	200	1244	746.4
St.31	-	-	-	-	-	-	-	-	-	-	-	-	-
St.32	-	-	-	-	-	-	-	-	-	-	-	-	-
St.33	20110424	0202	22.38	120.34	211	26.1	24.0	1010.42	076	4.6	200	1268	760.8
St.34	20110424	0427	22.49	120.01	574	26.1	23.4	1010.60	276	8.3	200	1078	646.8
St.35	20110424	0808	22.54	119.52	232	25.5	21.7	1012.74	344	11.7	200	1099	659.4
St.36	-	-	-	-	-	-	-	-	-	-	-	-	-
St.37	-	-	-	-	-	-	-	-	-	-	-	-	-
St.38	20110424	1122	22.54	119.51	77	23.8	22.5	1012.03	357	8.9	70	339	203.4
St.39	20110424	1354	23.01	119.91	128	25.4	24.3	1010.60	010	5.6	112	802	481.2
St.40	20110424	1645	23.50	119.92	119	26.1	23.2	1010.42	359	8.1	80	432	259.2
St.41	20110424	1901	23.44	119.48	50	24.9	22.2	1011.85	338	4.0	40	339	203.4
St.42	-	-	-	-	-	-	-	-	-	-	-	-	-
St.43	-	-	-	-	-	-	-	-	-	-	-	-	-
St.44	20110424	2236	24.00	119.52	60	24.5	22.5	1013.09	020	4.6	50	343	205.8
St.45	20110425	0119	24.00	120.00	40	25.1	22.9	1011.49	109	2.4	35	239	143.4
St.46	-	-	-	-	-	-	-	-	-	-	-	-	-
St.47	20110425	0400	24.52	120.02	62	24.5	22.1	1011.31	034	3.3	54	376	225.6
St.48	-	-	-	-	-	-	-	-	-	-	-	-	-
St.49	-	-	-	-	-	-	-	-	-	-	-	-	-
St.50	20110425	0745	25.02	120.67	77	23.4	21.7	1012.92	338	2.8	70	453	271.8
St.51	-	-	-	-	-	-	-	-	-	-	-	-	-
St.52	20110425	1036	25.51	120.50	62	24.4	21.3	1013.09	001	7.2	55	383	229.8
St.53	20110425	1448	26.00	120.99	78	24.0	20.8	1010.42	009	5.0	74	620	372.0
St.54	20110425	1815	25.50	121.00	91	24.4	21.3	1009.33	205	1.4	75	571	342.6
St.55	20110425	2058	25.49	121.51	114	24.3	22.2	1010.25	164	2.4	105	801	480.6
St.56	20110426	0040	25.88	121.50	72	24.0	21.9	1009.36	199	3.4	60	385	231.0
St.57	20110426	0359	26.00	122.00	101	23.1	21.1	1008.29	229	3.1	95	630	378.0
St.58	20110426	0656	26.00	122.51	105	25.0	24.6	1009.00	235	3.0	105	611	366.6
St.59	20110426	0943	26.00	123.00	94	25.6	24.5	1009.00	255	5.1	89	1130	678.0
St.60	20110426	1324	25.50	123.00	774	26.1	24.8	1007.22	224	4.0	200	334	200.4
St.61	20110426	1641	25.50	122.50	408	26.2	24.3	1005.44	222	2.6	200	1152	691.2
St.62	20110426	1935	25.49	122.01	121	24.6	23.4	1005.62	161	5.4	105	647	388.2

表 03. 2011-08-09 航次基礎觀測資料
Chart 03. Basic observation data in Aug.2011

Station	Date	SMT	Lati.	Long.	Depth	SST	Air T.	Air P.	Wind D.	Wind E.	O.N.D.	Fl. Ct.	V.M.S.
St.01	20110809	1948	24.86	122.00	307	29.1	27.9	1007.22	169	5.5	200	1341	804.6
St.02	20110810	0015	25.01	122.51	1456	29.6	28.1	1007.04	163	6.2	200	1832	1099.2
St.03	20110810	0328	25.00	123.01	1604	29.7	28.2	1007.04	170	4.7	200	1020	612.0
St.04	20110810	0913	24.51	122.51	586	30.3	28.4	1008.82	161	4.8	200	1057	634.2
St.05	20110810	1250	24.50	122.00	786	30.1	28.4	1006.69	182	5.4	200	1375	825.0
St.06	20110810	1756	24.04	121.72	300	30.1	29.3	1007.93	214	2.8	200	1103	661.8
St.07	20110810	2217	23.80	122.02	2636	30.4	28.1	1008.64	201	2.2	200	1096	657.6
St.08	20110811	0224	23.78	122.51	3558	29.9	27.0	1007.93	130	2.8	200	1001	600.6
St.09	20110811	0600	23.75	123.00	3631	30.4	28.2	1008.64	180	3.0	200	1011	606.6
St.10	20110811	1101	23.00	123.00	5216	30.7	28.7	1009.18	143	3.7	200	1022	613.2
St.11	20110811	1406	23.00	122.50	5525	31.0	29.0	1007.75	179	3.6	200	1079	647.4
St.12	20110811	1756	23.00	122.01	4892	30.8	28.8	1007.75	201	2.6	200	954	572.4
St.13	20110811	2218	23.01	121.52	2072	30.7	28.4	1008.47	214	3.4	200	1170	702.0
St.14	20110812	0230	22.67	121.25	1180	30.3	28.1	1007.22	234	3.8	200	1073	643.8
St.15	20110812	0656	22.26	121.00	1208	29.6	27.4	1008.64	307	2.4	200	1526	915.6
St.16	20110812	1055	22.26	121.51	682	30.7	29.6	1008.82	111	0.0	200	1000	600.0
St.17	20110812	1339	22.26	122.01	1067	30.7	29.0	1007.00	160	3.1	200	1239	743.4
St.18	20110812	1634	22.25	122.50	4847	30.8	28.9	1006.86	129	3.3	200	1116	669.6
St.19	20110812	1938	22.24	123.01	3933	30.7	28.8	1008.29	126	6.1	200	923	553.8
St.20	20110813	0043	21.49	123.01	4974	30.6	28.9	1007.04	164	6.4	200	927	556.2
St.21	20110813	0428	21.51	122.48	4790	30.7	28.8	1007.22	185	3.1	200	1051	630.6
St.22	20110813	0750	21.50	122.01	3472	30.5	28.9	1008.47	144	4.5	200	995	597.0
St.23	20110813	1115	21.49	121.50	2118	31.0	29.5	1008.47	148	5.6	200	991	594.6
St.24	20110813	1454	21.51	121.03	906	31.1	29.4	1007.93	136	5.0	200	924	554.4
St.25	20110813	1835	21.49	120.52	1882	31.1	29.1	1008.64	136	7.2	200	888	532.8
St.26	20110813	2225	21.48	120.02	2902	31.2	29.3	1009.53	146	6.3	200	1193	715.8
St.27	20110814	0220	21.48	119.52	3024	30.9	28.9	1007.93	139	7.7	200	838	502.8
St.28	20110814	0608	21.50	119.01	2798	31.0	29.1	1008.47	140	7.0	200	821	492.6
St.29	20110814	0923	22.00	119.01	1491	31.1	29.5	1010.42	140	5.6	200	1020	612.0
St.30	20110814	1234	22.00	119.50	2348	31.2	29.7	1010.25	158	6.5	200	1015	609.0
St.31	20110814	1546	22.00	119.99	1072	31.1	29.4	1009.18	132	6.4	200	934	560.4
St.32	20110814	1853	22.00	120.52	652	31.1	29.2	1008.89	120	8.1	200	988	592.8
St.33	20110814	2201	22.37	120.31	557	30.7	29.5	1011.14	146	6.1	200	1021	612.6
St.34	20110815	0011	22.50	120.00	642	30.8	29.2	1009.71	147	8.6	200	767	460.2
St.35	20110815	0326	22.50	119.53	276	30.8	29.2	1008.64	157	8.6	200	785	471.0
St.36	20110815	0649	22.50	119.01	86	30.9	29.5	1010.07	159	6.5	80	333	199.8
St.37	20110815	0915	22.95	119.10	28	29.0	28.6	1011.49	153	2.0	20	115	69.0
St.38	20110815	1122	23.00	119.50	74	30.7	29.6	1011.14	161	6.3	72	330	198.0
St.39	20110815	1336	22.99	119.91	126	31.0	29.3	1010.25	176	7.0	120	680	408.0
St.40	20110815	1643	23.50	119.92	104	31.6	29.3	1009.18	216	5.6	110	584	350.4
St.41	20110815	1916	23.43	119.50	49	28.8	27.4	1009.53	216	4.3	48	357	214.2
St.42	20110815	2157	23.50	119.00	52	29.6	28.5	1010.07	209	6.1	42	264	158.4
St.43	20110816	0040	24.00	119.06	63	30.4	29.5	1008.64	204	7.0	57	308	184.8
St.44	20110816	0309	24.01	119.53	64	29.7	27.5	1006.64	195	3.0	57	375	225.0
St.45	20110816	0600	24.00	120.00	37	29.5	28.5	1009.36	214	6.4	30	214	128.4
St.46	20110816	0927	24.50	120.50	51	30.0	28.8	1010.42	206	6.0	45	228	136.8
St.47	20110816	1225	24.50	120.00	61	29.8	28.1	1009.36	222	4.7	56	310	186.0
St.48	20110816	1529	24.50	119.51	59	30.3	29.0	1007.58	225	7.0	55	353	211.8
St.49	20110816	1854	25.00	120.00	50	30.0	28.2	1007.22	209	8.4	47	238	142.8
St.50	20110816	2126	24.99	120.49	74	29.5	28.1	1008.29	219	9.1	68	291	174.6
St.51	20110816	2356	25.08	120.90	70	30.0	28.3	1007.40	225	9.7	65	357	214.2
St.52	20110817	0325	25.49	120.52	64	28.2	26.9	1007.75	225	7.0	49	305	183.0
St.53	20110817	0654	26.00	121.01	77	28.8	26.9	1007.93	234	8.7	70	517	310.2
St.54	20110817	1013	25.51	121.00	88	29.5	28.4	1008.64	222	9.7	80	465	279.0
St.55	20110817	1305	25.50	121.50	112	30.3	29.2	1007.04	235	8.1	105	538	322.8
St.56	20110817	1623	26.00	121.50	67	30.0	28.3	1006.69	220	6.3	60	320	192.0
St.57	20110817	1909	26.00	121.99	100	30.0	27.9	1007.22	181	6.9	95	570	342.0
St.58	20110817	2254	25.99	122.49	104	29.7	28.1	1007.93	192	9.8	100	486	291.6
St.59	20110818	0220	25.99	122.99	94	29.5	28.0	1008.82	204	6.6	85	451	270.6
St.60	-	-	-	-	-	-	-	-	-	-	-	-	-
St.61	20110818	0957	25.49	122.51	415	29.4	27.9	1009.71	186	5.9	100	1137	682.2
St.62	20110818	1415	25.49	122.02	122	29.3	28.0	1008.11	148	6.3	110	442	265.2

表 04. 2011-10-17 航次基礎觀測資料
Chart 04. Basic observation data in Oct.2011

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	20111017	1647	24.88	122.00	239	26.2	24.1	1015.05	016	7.8	200	1106	663.6
St.02	20111017	2023	25.01	122.50	1438	26.5	24.6	1015.59	023	9.6	200	1686	1011.6
St.03	20111018	0007	25.01	123.00	1589	27.6	24.8	1014.00	030	10.7	200	1057	634.2
St.04	20111018	0532	24.51	122.50	593	28.6	25.0	1014.70	028	11.9	200	1011	606.6
St.05	20111018	0907	24.51	122.00	788	27.8	24.8	1017.37	010	8.7	200	1130	678.0
St.06	20111018	1335	24.01	121.69	330	28.7	24.8	1014.70	031	10.3	200	1056	633.6
St.07	20111018	1630	23.77	122.00	2994	28.0	25.3	1014.34	024	12.2	200	917	550.2
St.08	20111018	2015	23.77	122.52	3238	27.8	24.9	1014.70	030	13.0	200	1146	687.6
St.09	20111018	2356	23.75	123.00	3640	28.0	25.2	1012.92	031	11.4	200	952	571.2
St.10	20111019	0503	23.00	123.00	5397	29.0	25.5	1012.38	026	12.6	200	1028	616.8
St.11	20111019	0838	23.01	122.50	5507	28.9	25.6	1013.98	028	11.8	200	1090	654.0
St.12	20111019	1155	23.02	122.00	4873	28.8	25.4	1013.27	018	12.6	200	1140	684.0
St.13	20111019	1520	23.00	121.50	1992	28.1	24.6	1011.85	015	13.0	200	985	591.0
St.14	20111019	1813	22.67	121.25	1190	28.6	24.8	1012.20	030	13.1	200	1246	747.6
St.15	20111019	2128	22.25	121.00	1207	28.2	24.6	1012.92	018	12.4	200	1102	661.2
St.16	20111020	0125	22.26	121.49	560	28.0	25.1	1010.60	014	12.3	200	1123	673.8
St.17	20111020	0500	22.26	122.00	4574	28.5	26.0	1010.60	019	10.4	200	1022	613.2
St.18	20111020	0838	22.26	122.50	4838	29.1	26.7	1012.03	017	9.3	200	1529	917.4
St.19	20111020	1205	22.26	123.00	3406	29.1	26.3	1009.53	023	8.0	200	1486	891.6
St.20	20111020	1700	21.51	123.00	5009	30.1	27.4	1009.18	058	5.6	200	1242	745.2
St.21	20111020	2007	21.50	122.50	4790	29.7	26.9	1010.42	064	4.7	200	1105	663.0
St.22	20111020	2310	21.52	121.99	3478	29.6	26.2	1010.60	024	7.5	200	1177	706.2
St.23	20111021	0220	21.51	121.50	2088	28.8	26.2	1009.18	016	8.7	200	1171	702.6
St.24	20111021	0556	21.51	121.02	1013	28.9	26.3	1009.89	025	9.2	200	946	567.6
St.25	20111021	0959	21.50	120.51	1808	29.2	26.4	1010.96	049	8.3	200	1040	624.0
St.26	20111021	1309	21.51	119.98	2971	29.6	27.1	1009.71	332	4.3	200	1310	786.0
St.27	20111021	1617	21.51	119.50	2970	29.2	26.4	1009.53	003	6.4	200	999	599.4
St.28	20111021	1935	21.50	119.00	2782	29.0	26.3	1010.78	018	7.3	200	1024	614.4
St.29	20111021	2326	22.00	119.00	1435	29.1	25.6	1011.14	019	6.7	200	1263	757.8
St.30	20111022	0244	22.01	119.50	2361	29.0	26.0	1009.36	009	7.2	200	1137	682.2
St.31	20111022	0605	22.00	120.01	1174	29.1	26.1	1010.60	038	3.1	200	1379	827.4
St.32	20111022	0900	21.99	120.51	431	29.9	27.1	1011.67	061	6.5	200	1309	785.4
St.33	20111022	1202	22.37	120.33	477	29.7	26.9	1011.49	272	2.6	200	1146	687.6
St.34	20111022	1422	22.51	120.00	632	29.8	26.0	1010.25	323	4.1	200	1100	660.0
St.35	20111022	1736	22.51	119.50	226	28.9	25.4	1010.42	016	9.0	200	1198	718.8
St.36	20111022	2004	22.50	119.17	100	28.6	25.0	1012.38	025	9.4	95	604	362.4
St.37	20111022	2315	22.92	119.10	25	27.9	24.3	1011.85	031	11.1	17	207	124.2
St.38	20111023	0152	23.01	119.49	72	28.2	24.7	1010.42	019	10.8	70	472	283.2
St.39	20111023	0739	23.00	119.91	126	28.3	24.4	1012.38	024	7.0	119	794	476.4
St.40	20111023	1103	23.49	119.92	114	28.7	24.6	1012.20	015	9.6	109	650	390.0
St.41	20111023	1323	23.44	119.50	57	28.1	24.6	1010.78	017	10.6	50	359	215.4
St.42	20111023	1609	23.50	119.00	51	27.2	23.8	1010.96	018	8.7	48	208	124.8
St.43	20111023	1856	24.00	119.00	60	26.6	23.4	1012.56	042	9.3	55	302	181.2
St.44	20111023	2202	24.00	119.50	62	27.0	23.9	1011.85	027	7.9	55	197	118.2
St.45	20111024	0111	23.99	119.97	41	27.2	24.0	1011.67	007	9.3	40	262	157.2
St.46	20111024	0521	24.50	120.50	52	27.2	24.1	1011.31	025	7.7	45	296	177.6
St.47	20111024	0810	24.50	120.00	62	26.5	23.2	1012.38	010	6.5	50	294	176.4
St.48	20111024	1104	24.50	119.50	64	26.8	22.9	1012.74	346	6.2	59	316	189.6
St.49	20111024	1458	25.01	120.02	48	27.0	22.9	1011.31	046	6.5	45	351	210.6
St.50	20111024	1747	25.00	120.49	76	26.2	23.0	1011.85	034	5.8	70	389	233.4
St.51	20111024	2036	25.09	120.91	76	26.6	24.3	1013.09	55	9.4	65	356	213.6
St.52	20111025	0006	25.51	120.52	64	25.8	23.0	1013.45	036	17.0	59	449	269.4
St.53	20111025	0608	26.00	120.99	79	25.2	21.7	1016.65	028	16.0	75	486	291.6
St.54	20111025	0958	25.50	121.00	92	26.4	22.4	1016.12	037	16.0	85	396	237.6
St.55	20111025	1311	25.50	121.51	116	25.3	22.0	1015.76	036	16.3	109	970	582.0
St.56	20111026	1650	26.00	121.50	66	25.4	21.7	1016.83	040	12.2	61	201	120.6
St.57	20111026	2017	26.00	121.99	100	25.5	22.4	1017.37	048	11.6	95	475	285.0
St.58	20111026	2313	26.00	122.50	103	26.0	23.1	1017.19	049	10.5	90	467	280.2
St.59	20111027	0211	26.00	122.99	95	26.3	23.3	1016.12	034	9.6	85	531	318.6
St.60	20111027	0534	25.51	123.00	773	27.7	23.8	1015.59	043	5.4	200	1079	647.4
St.61	20111027	0838	25.51	122.50	398	27.1	23.7	1016.83	033	10.5	200	1088	652.8
St.62	20111027	1149	25.50	122.02	122	25.7	23.2	1015.94	049	8.1	112	717	430.2

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