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# 2015 年港灣環境資訊網觀測資料年報 (宜蘭海域觀測海氣象資料)



交通部運輸研究所

中華民國 106 年 9 月

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| 摘要：<br><p style="text-align: center;">本港灣環境資訊網觀測海氣象資料年報，包括宜蘭海域2015年觀測風力、波浪、潮汐及海流等資料之觀測記錄表及逐時資料歷線圖。</p>                                                                                                                                                                                                                                                           |                         |                            |                                                              |
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| 備註：本研究之結論與建議不代表交通部之意見。                                                                                                                                                                                                                                                                                                                                           |                         |                            |                                                              |

**PUBLICATION ABSTRACTS OF RESEARCH PROJECTS  
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| ABSTRACT:<br><br><p style="margin-left: 40px;">This Annual report 2015 of Harbor Environment Information Website(HEIV) covers the observation data of winds, waves, tides and currents near Yi-Lan offshoe region in Taiwan. The contents in this Annual report include the records of observation and the time series of data.</p>                                                                                                                          |                                              |                                   |                                                                                                                                                                                                                        |
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# 2015 年港灣環境資訊網觀測資料年報 (宜蘭海域觀測海氣象資料)

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## 誌 謝

2015 年港灣環境資訊網觀測風力資料，蒐集之宜蘭海域風力資料，除本中心自行觀測之外，在蘇澳氣象站(測站 E 及 F)、宜蘭氣象站(測站 H)等，係交通部中央氣象局(CWB)提供;蘇澳海上浮標(測站 Y)觀測風力資料，係經濟部水利署(WRA)提供;福隆海上浮標(測站 R)觀測風力資料，係國立成功大學水文中心(COMC)裝設;龜山島外海浮標站(測站 Z)之風速儀屬觀光局東北角管理處(TBRC)所設置，謹致謝忱。

2015 年港灣環境資訊網觀測波浪資料，蒐集之宜蘭海域波浪資料，除本中心自行觀測之外，在蘇澳海上浮標(測站 Y)觀測波浪資料，係經濟部水利署(WRA)提供;福隆海上浮標(測站 R)觀測波浪儀，係國立成功大學水文中心(COMC)裝設;龜山島外海浮標站(測站 Z)之波浪儀屬觀光局東北角管理處(TBRC)所設置，謹致謝忱。

2015 年港灣海氣象觀測潮汐資料，蒐集之宜蘭海域潮汐觀測資料，除本中心自行觀測之外，在蘇澳港(測站 F)、烏石(測站 J)、福隆(測站 K)等觀測潮汐資料，係交通部中央氣象局提供，謹致謝忱。

2015 年港灣環境資訊網觀測海流資料，蒐集之宜蘭海域海流資料，除本中心自行觀測之外，在蘇澳海上浮標(測站 Y)觀測海流資料，係經濟部水利署(WRA)提供，謹致謝忱。

# 第一章 2015 年宜蘭海域觀測風力資料

宜蘭海域風之觀測係 2003 年 6 月本所港研中心(IHMT)於蘇澳港安裝一具風速風向即時傳送監測系統(稱**測站 W**)，其位置如附圖 1，2012 年 10 月更新為 Gill 二維超音波式風速計。**測站 E、測站 F 及測站 H**之風速儀屬中央氣象局所有，**測站 Y**(蘇澳外海浮標站)之風速儀屬水利署(WRA)所有，**測站 Z**(龜山島外海浮標站)之風速儀屬觀光局東北角管理處(TBRC)所設置。福隆海上浮標(**測站 R**)觀測風力，係國立成功大學水文中心(COMC)所裝設。

本中心測站風資料之蒐集係採取每小時測定十分鐘之風速、風向數據加以平均，而得出該小時之平均風速、平均風向、最大陣風風速、最大陣風風向、最大陣風之發生時間。本中心之風力資料以取平均風速及平均風向為主。其他測站觀測風速、風向資料也是平均風速(m/s)及風向(度)。各測站歷年觀測風資料蒐集概況如表 1。

本風力年報以取經檢核或修補後之 **W 站** 資料作為**主要觀測站**，2015 年主要觀測站修補前(後)每月觀測之風資料記錄期間統計表，如表 1.1a，2015 年風力**次要觀測站**資料(未補餘)記錄統計表，如表 1.1b，**主要觀測站修補前後**每月風力歷線比較圖，如圖 1.1，**主要觀測站與次要觀測站(或其他觀測站)**每月風力歷線比較圖，如圖 1.2 以後。

表 1 宜蘭海域觀測風力資料蒐集概況表(統計時間至 2015 年 11 月)

| 測站 | 緯度         | 經度          | 觀測期間                 | 觀測單位  | 備註     |
|----|------------|-------------|----------------------|-------|--------|
| W  | 24°35'33"N | 121°51'01"E | 2003/06-2015/11(觀測中) | 港研中心  | 蘇澳港區   |
| E  | 24°35'48"N | 121°51'26"E | 1999/01-2015/11(觀測中) | 中央氣象局 | 蘇澳     |
| Y  | 24°37'38"N | 121°52'36"E | 1999/09-2015/11(觀測中) | 水利署   | 蘇澳浮標站  |
| Z  | 24°50'52"N | 121°55'39"E | 2002/05-2015/11(觀測中) | 觀光局   | 龜山島浮標站 |
| H  | 24°45'56"N | 121°44'53"E | 2013/11-2015/11(觀測中) | 中央氣象局 | 宜蘭     |
| R  | 22°18'50"N | 120°21'50"E | 2006/04-2008/02      | 水文中心  | 福隆浮標站  |
| F  | 24°35'33"N | 121°51'56"E | 2015/04-2015/11(觀測中) | 中央氣象局 | 蘇澳     |

# 宜蘭海域



WRA 浮標風速站



IHMT 風速站



COMC 福隆浮標風速站



CWB 風速站



TBRC 龜山島浮標風速站



圖 1 宜蘭海域風力觀測站位置示意圖

表 1.1a 2015年每月宜蘭海域修補前各測站觀測風力資料紀錄統計表

| 年/月 港區   | 宜蘭海域        |              | 宜蘭海域         |   | 宜蘭海域          |               | 宜蘭海域         |  | 宜蘭海域 |  |
|----------|-------------|--------------|--------------|---|---------------|---------------|--------------|--|------|--|
| 測站       | W           | Y            | Z            | R | E             | H             | F            |  |      |  |
| 2014/12月 | 744 (100%)  | 741 (99.6%)  | 738 (99.2%)  | * | 744 (100%)    | 744 (100%)    | *            |  | *    |  |
| 2015/ 1月 | 744 (100%)  | 733 (98.5%)  | 731 (98.3%)  | * | 743 (99.9%)   | 743 (99.9%)   | *            |  | *    |  |
| 2015/ 2月 | 672 (100%)  | 431 (64.1%)  | 668 (99.4%)  | * | 672 (100%)    | 672 (100%)    | *            |  | *    |  |
| 2015/ 3月 | 744 (100%)  | 638 (85.8%)  | 736 (98.9%)  | * | 744 (100%)    | 744 (100%)    | *            |  | *    |  |
| 2015/ 4月 | 720 (100%)  | 697 (96.8%)  | 709 (98.5%)  | * | 720 (100%)    | 720 (100%)    | 396 (55.0%)  |  | *    |  |
| 2015/ 5月 | 744 (100%)  | 730 (98.1%)  | 731 (98.3%)  | * | 744 (100%)    | 744 (100%)    | 259 (34.8%)  |  | *    |  |
| 2015/ 6月 | 720 (100%)  | 711 (98.8%)  | 716 (99.4%)  | * | 720 (100%)    | 720 (100%)    | 490 (68.1%)  |  | *    |  |
| 2015/ 7月 | 744 (100%)  | 734 (98.7%)  | 738 (99.2%)  | * | 744 (100%)    | 744 (100%)    | 346 (46.5%)  |  | *    |  |
| 2015/ 8月 | 744 (100%)  | 166 (22.3%)  | 739 (99.3%)  | * | 744 (100%)    | 744 (100%)    | 574 (77.2%)  |  | *    |  |
| 2015/ 9月 | 720 (100%)  | *            | 684 (95.0%)  | * | 720 (100%)    | 720 (100%)    | 594 (82.5%)  |  | *    |  |
| 2015/10月 | 744 (100%)  | 395 (53.1%)  | 701 (94.2%)  | * | 744 (100%)    | 744 (100%)    | 381 (51.2%)  |  | *    |  |
| 2015/11月 | 720 (100%)  | 717 (99.6%)  | 711 (98.8%)  | * | 720 (100%)    | 720 (100%)    | 653 (90.7%)  |  | *    |  |
| 2015/冬季  | 2160 (100%) | 1905 (88.2%) | 2137 (98.9%) | * | 2159 (100.0%) | 2159 (100.0%) | *            |  | *    |  |
| 2015/春季  | 2208 (100%) | 2065 (93.5%) | 2176 (98.6%) | * | 2208 (100%)   | 2208 (100%)   | 655 (29.7%)  |  | *    |  |
| 2015/夏季  | 2208 (100%) | 1611 (73.0%) | 2193 (99.3%) | * | 2208 (100%)   | 2208 (100%)   | 1410 (63.9%) |  | *    |  |
| 2015/秋季  | 2184 (100%) | 1112 (50.9%) | 2096 (96.0%) | * | 2184 (100%)   | 2184 (100%)   | 1628 (74.5%) |  | *    |  |
| 2015/整年  | 8760 (100%) | 6693 (76.4%) | 8602 (98.2%) | * | 8759 (100.0%) | 8759 (100.0%) | 3693 (42.2%) |  | *    |  |
| 起始年月     | 2014/12     | 2014/12      | 2014/12      | * | 2014/12       | 2014/12       | 2015/04      |  | *    |  |
| 結束年月     | 2015/11     | 2015/11      | 2015/11      | * | 2015/11       | 2015/11       | 2015/11      |  | *    |  |

表1.1b 2015年每月宜蘭海域修補後各測站風力資料統計表

| 年/月      | 港區          | 宜蘭海域        | 宜蘭海域        | 宜蘭海域 | 宜蘭海域        | 宜蘭海域        | 宜蘭海域 | 宜蘭海域 | 宜蘭海域 |
|----------|-------------|-------------|-------------|------|-------------|-------------|------|------|------|
| 測站       | W           | Y           | Z           | R    | E           | H           | F    |      |      |
| 2014/12月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 1月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 2月 | 672 (100%)  | 672 (100%)  | 672 (100%)  | *    | 672 (100%)  | 672 (100%)  | *    |      | *    |
| 2015/ 3月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 4月 | 720 (100%)  | 720 (100%)  | 720 (100%)  | *    | 720 (100%)  | 720 (100%)  | *    |      | *    |
| 2015/ 5月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 6月 | 720 (100%)  | 720 (100%)  | 720 (100%)  | *    | 720 (100%)  | 720 (100%)  | *    |      | *    |
| 2015/ 7月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 8月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/ 9月 | 720 (100%)  | 720 (100%)  | 720 (100%)  | *    | 720 (100%)  | 720 (100%)  | *    |      | *    |
| 2015/10月 | 744 (100%)  | 744 (100%)  | 744 (100%)  | *    | 744 (100%)  | 744 (100%)  | *    |      | *    |
| 2015/11月 | 720 (100%)  | 720 (100%)  | 720 (100%)  | *    | 720 (100%)  | 720 (100%)  | *    |      | *    |
| 2015/冬季  | 2160 (100%) | 2160 (100%) | 2160 (100%) | *    | 2160 (100%) | 2160 (100%) | *    |      | *    |
| 2015/春季  | 2208 (100%) | 2208 (100%) | 2208 (100%) | *    | 2208 (100%) | 2208 (100%) | *    |      | *    |
| 2015/夏季  | 2208 (100%) | 2208 (100%) | 2208 (100%) | *    | 2208 (100%) | 2208 (100%) | *    |      | *    |
| 2015/秋季  | 2184 (100%) | 2184 (100%) | 2184 (100%) | *    | 2184 (100%) | 2184 (100%) | *    |      | *    |
| 2015/整年  | 8760 (100%) | 8760 (100%) | 8760 (100%) | *    | 8760 (100%) | 8760 (100%) | *    |      | *    |
| 起始年月     | 2014/12     | 2014/12     | 2014/12     | *    | 2014/12     | 2014/12     | *    |      | *    |
| 結束年月     | 2015/11     | 2015/11     | 2015/11     | *    | 2015/11     | 2015/11     | *    |      | *    |

# Wind Speed in Yi-Lan Seas of SAW0 at 2015

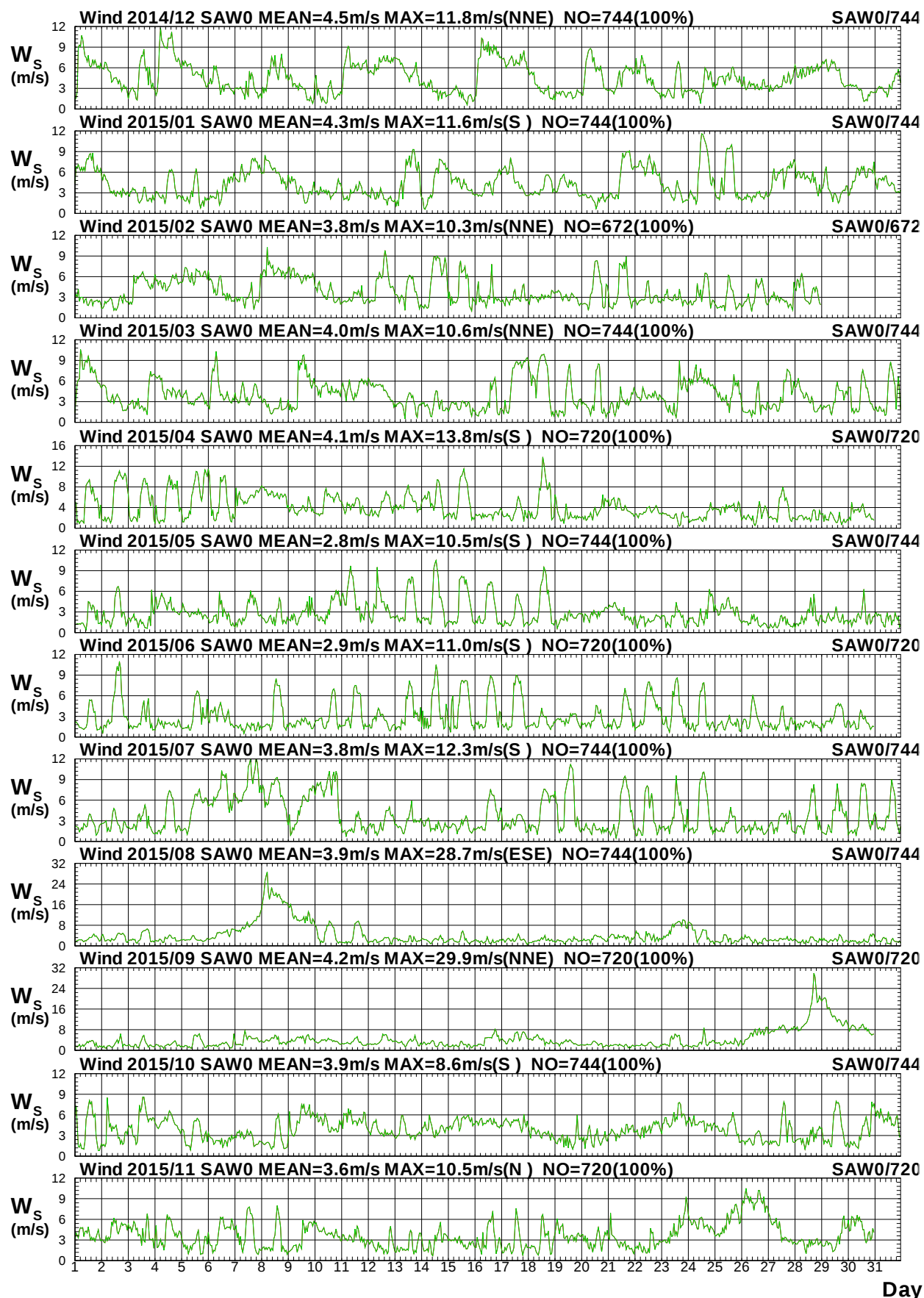


圖 1.1a 2015 年每月宜蘭海域 W 站修補前後之風速比較圖

W14CSAW0.1HA W14CSAW0.1H0 W151SAW0.1HA W151SAW0.1H0 W152SAW0.1HA W152SAW0.1H0

W153SAW0.1HA W153SAW0.1H0 W154SAW0.1HA W154SAW0.1H0 W155SAW0.1HA W155SAW0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

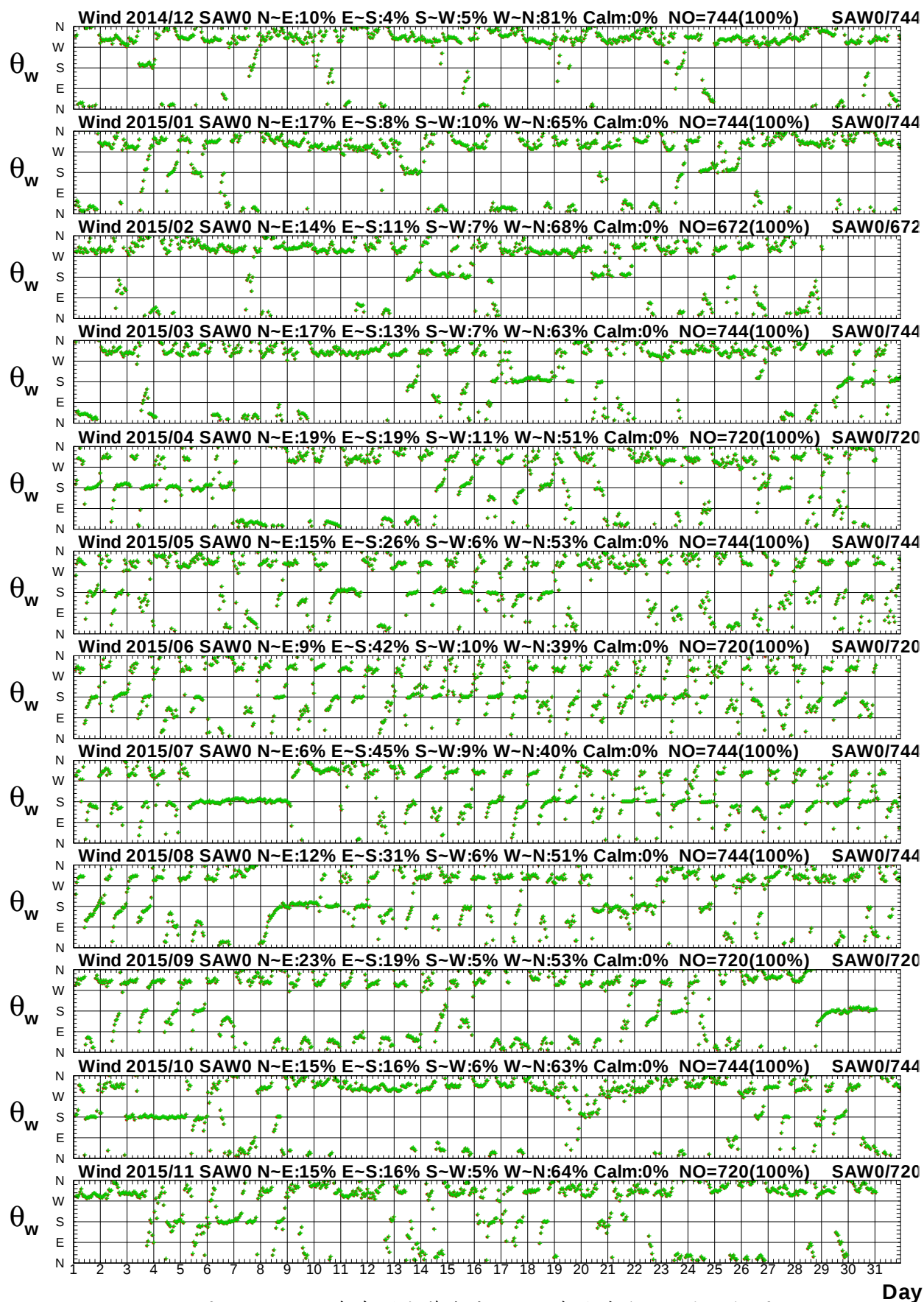


圖 1.1b 2015 年每月宜蘭海域 W 站修補前後之風向比較圖

W14CSAW0.1HA W14CSAW0.1H0 W151SAW0.1HA W151SAW0.1H0 W152SAW0.1HA W152SAW0.1H0

W153SAW0.1HA W153SAW0.1H0 W154SAW0.1HA W154SAW0.1H0 W155SAW0.1HA W155SAW0.1H0 Institute of Harbor & Marine Technology

# Wind Speed in Yi-Lan Seas of SAW0 at 2015

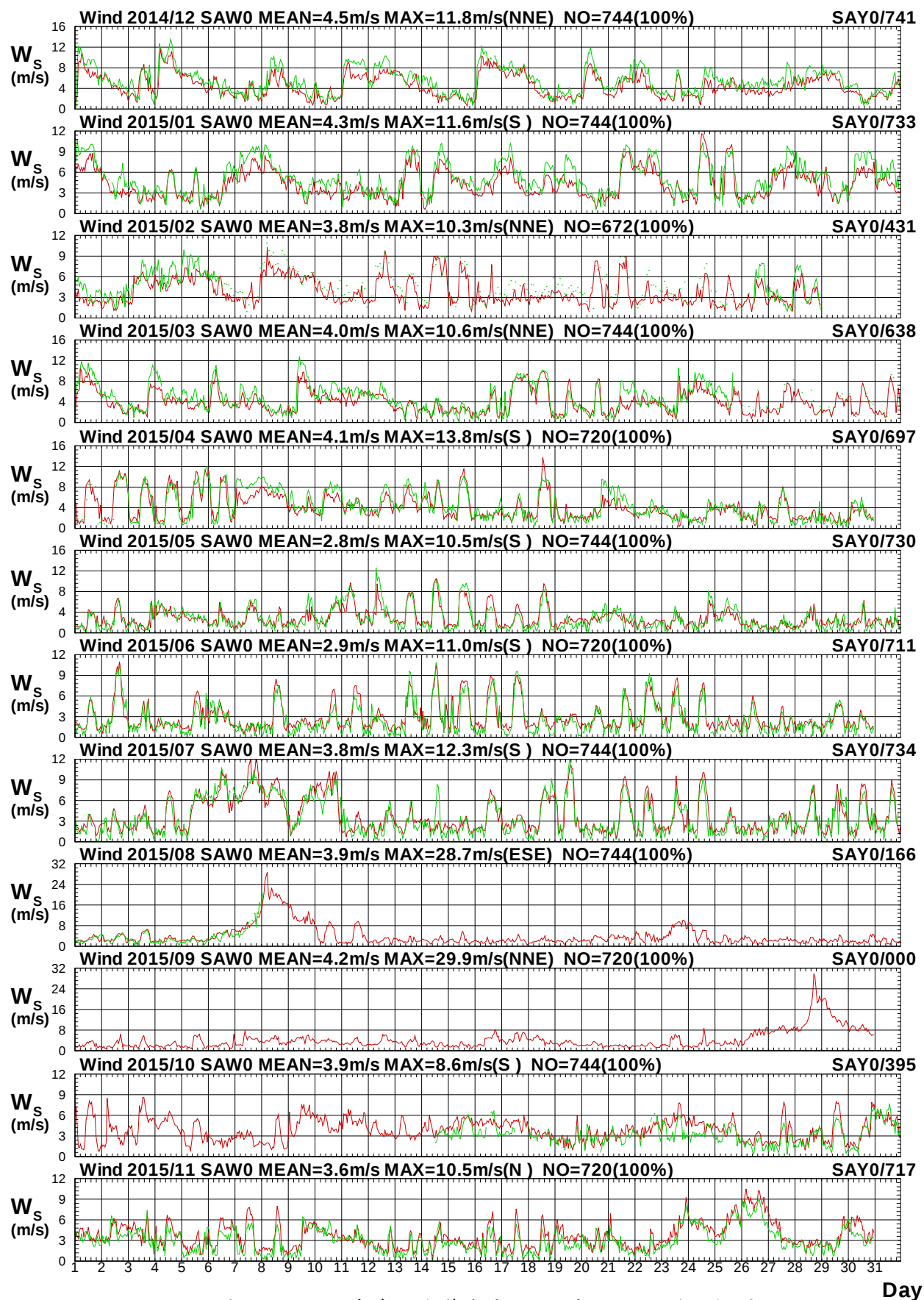


圖 1.2a 2015年每月宜蘭海域 W 站與 Y 站風速比較圖

W14CSAW0.1HA W14CSAY0.1H0 W151SAW0.1HA W151SAY0.1H0 W152SAW0.1HA W152SAY0.1H0  
W153SAW0.1HA W153SAY0.1H0 W154SAW0.1HA W154SAY0.1H0 W155SAW0.1HA W155SAY0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

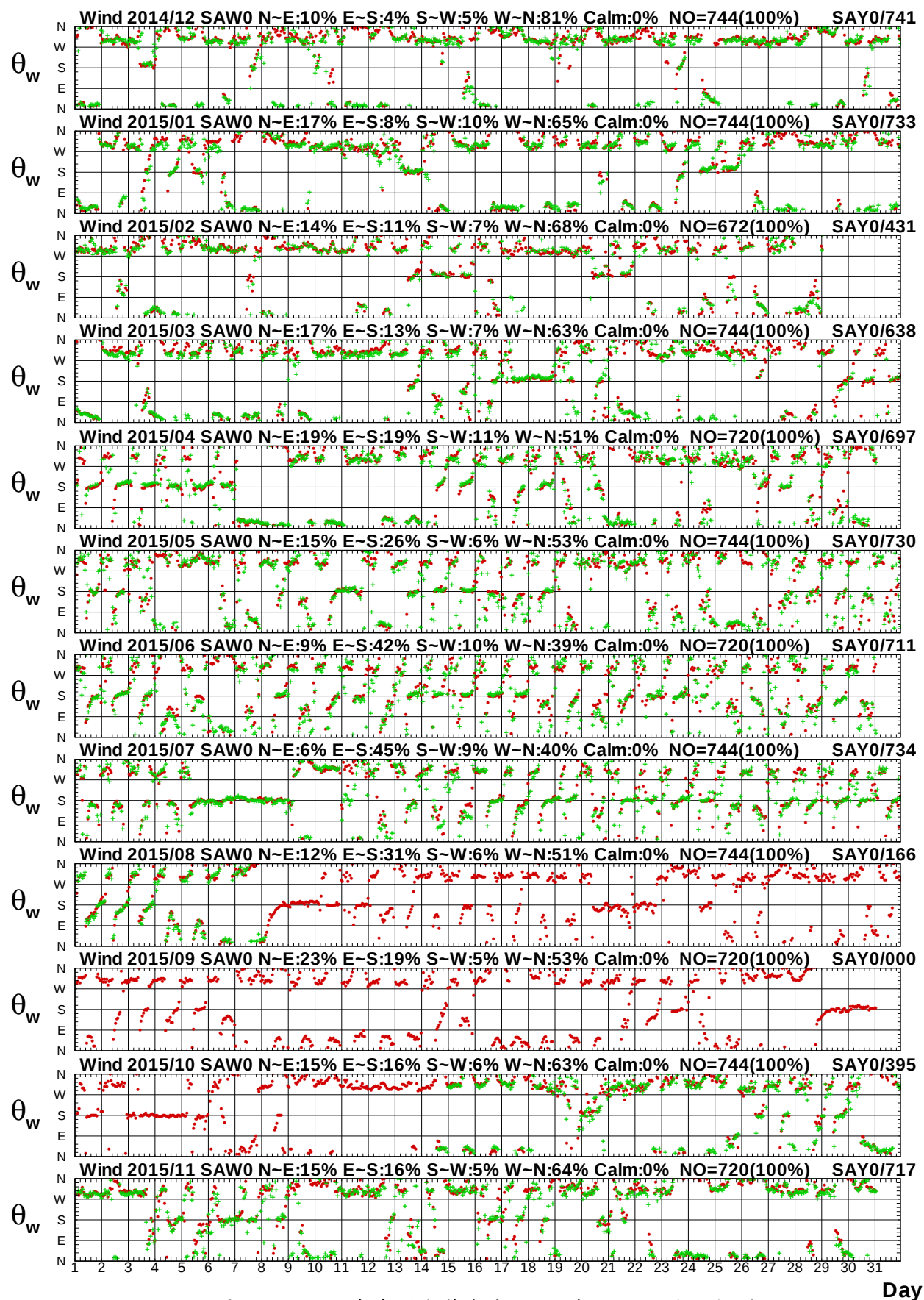


圖 1.2b 2015 年每月宜蘭海域 W 站與 Y 站風向比較圖

W14CSAW0.1HA W14CSAY0.1H0 W151SAW0.1HA W151SAY0.1H0 W152SAW0.1HA W152SAY0.1H0  
W153SAW0.1HA W153SAY0.1H0 W154SAW0.1HA W154SAY0.1H0 W155SAW0.1HA W155SAY0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

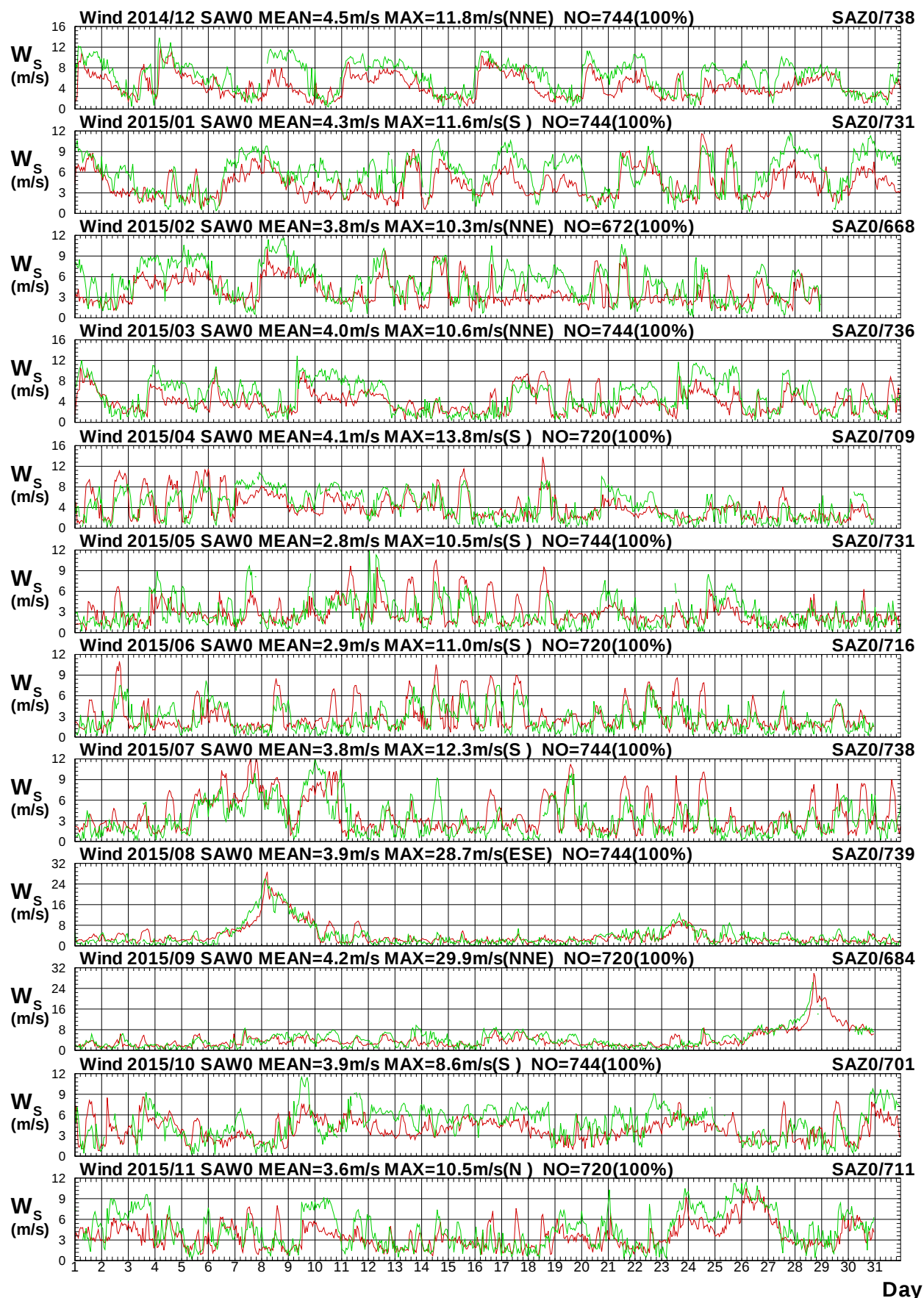


圖 1.3a 2015年每月宜蘭海域 W 站與 Z 站風速比較圖

W14CSAW0.1HA W14CSAZ0.1H0 W151SAW0.1HA W151SAZ0.1H0 W152SAW0.1HA W152SAZ0.1H0  
W153SAW0.1HA W153SAZ0.1H0 W154SAW0.1HA W154SAZ0.1H0 W155SAW0.1HA W155SAZ0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

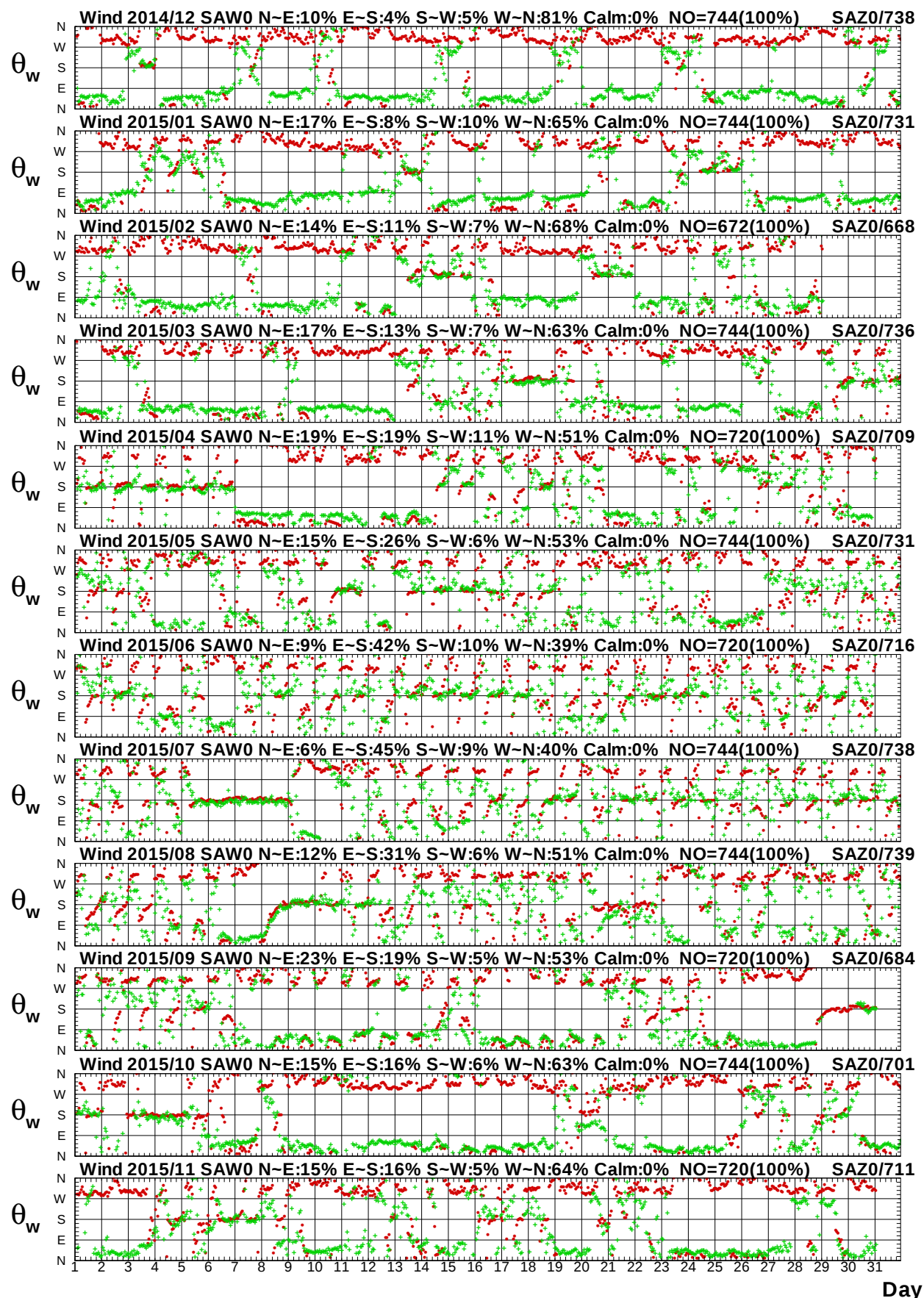


圖 1.3b 2015年每月宜蘭海域 W 站與 Z 站風向比較圖

W14CSAW0.1HA W14CSAZ0.1H0 W151SAW0.1HA W151SAZ0.1H0 W152SAW0.1HA W152SAZ0.1H0  
W153SAW0.1HA W153SAZ0.1H0 W154SAW0.1HA W154SAZ0.1H0 W155SAW0.1HA W155SAZ0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

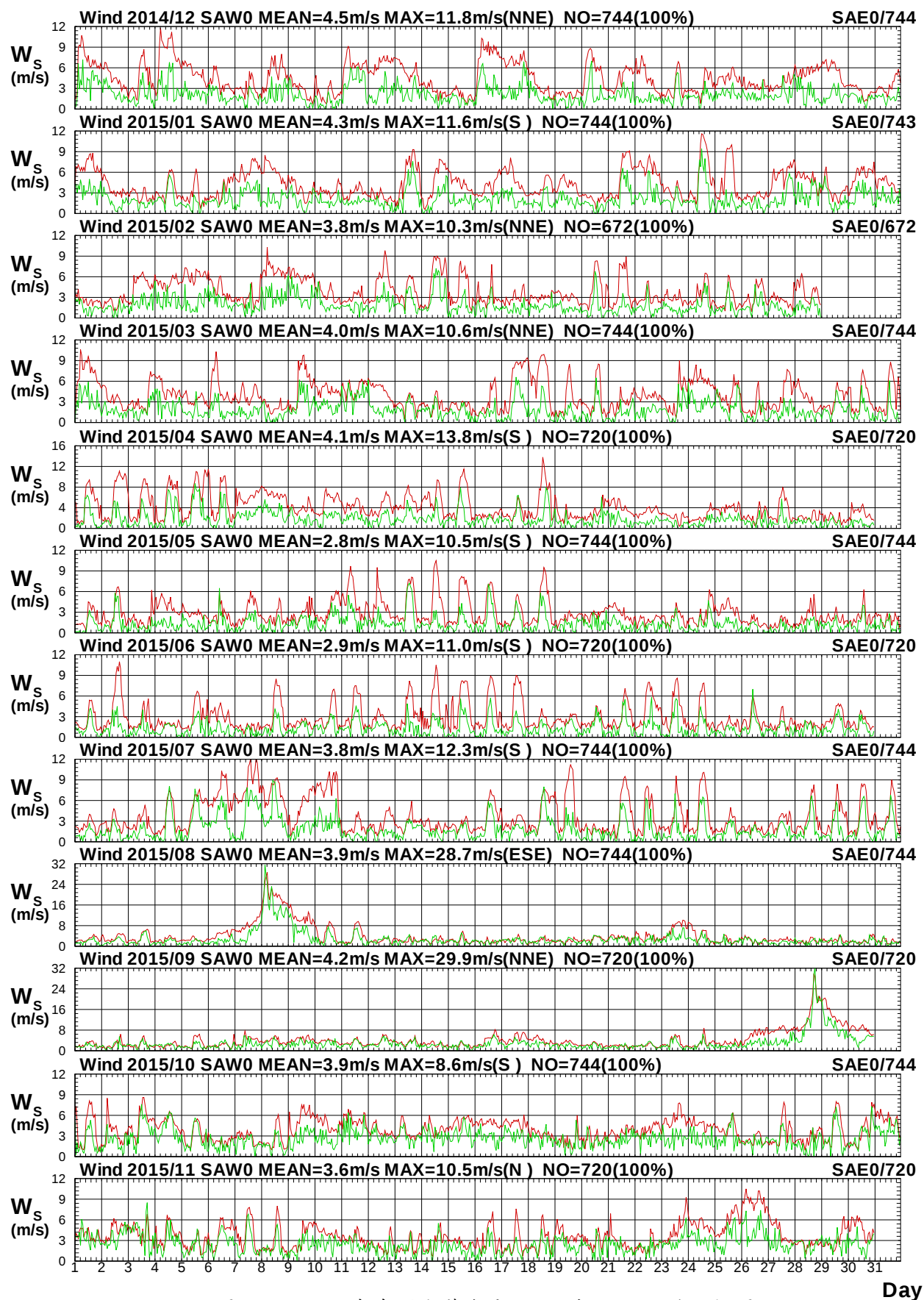


圖 1.4a 2015年每月宜蘭海域 W 站與 E 站風速比較圖

W14CSAW0.1HA W14CSAE0.1H0 W151SAW0.1HA W151SAE0.1H0 W152SAW0.1HA W152SAE0.1H0  
W153SAW0.1HA W153SAE0.1H0 W154SAW0.1HA W154SAE0.1H0 W155SAW0.1HA W155SAE0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

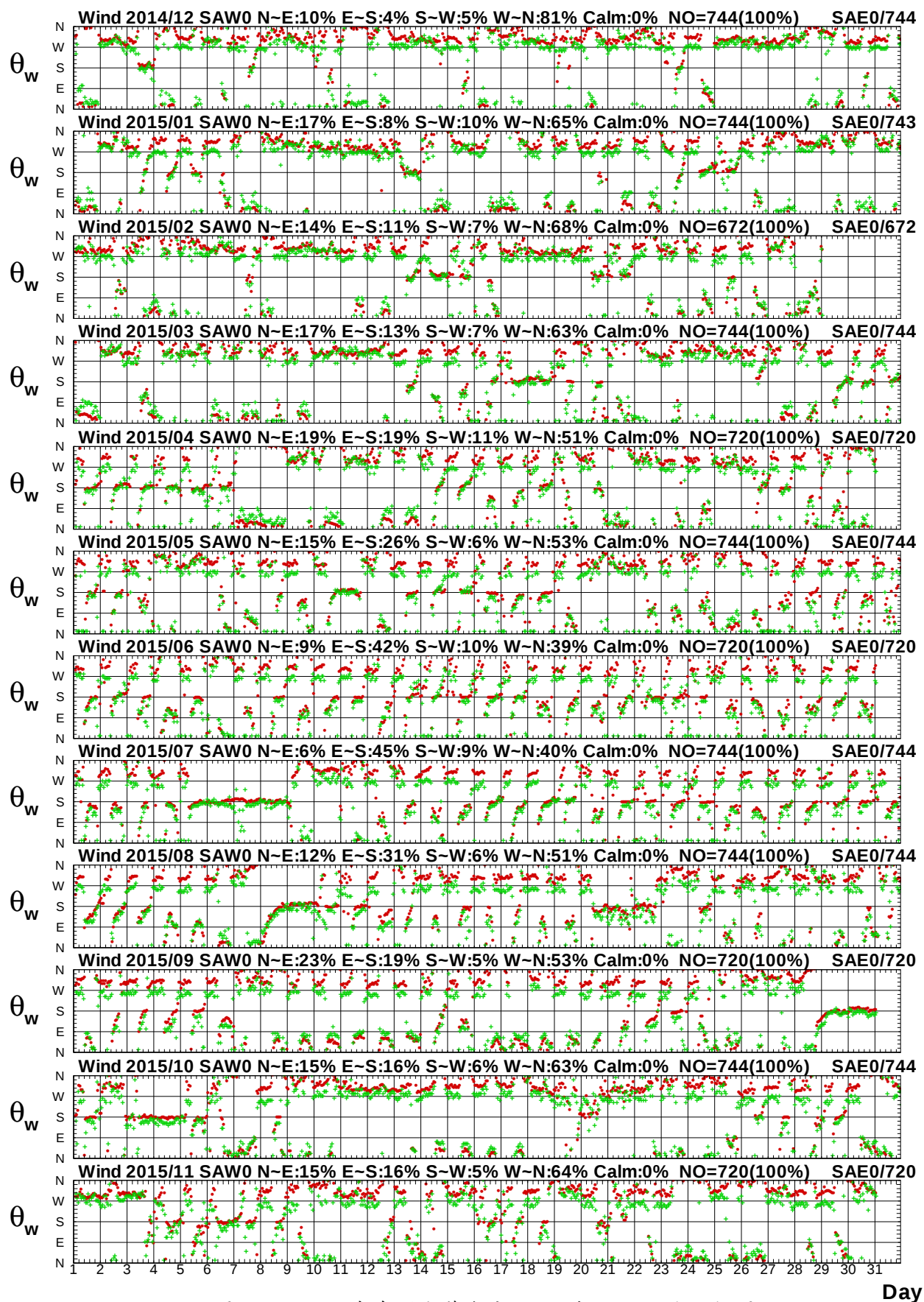


圖 1.4b 2015年每月宜蘭海域 W 站與 E 站風向比較圖

W14CSAW0.1HA W14CSAE0.1H0 W151SAW0.1HA W151SAE0.1H0 W152SAW0.1HA W152SAE0.1H0  
W153SAW0.1HA W153SAE0.1H0 W154SAW0.1HA W154SAE0.1H0 W155SAW0.1HA W155SAE0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

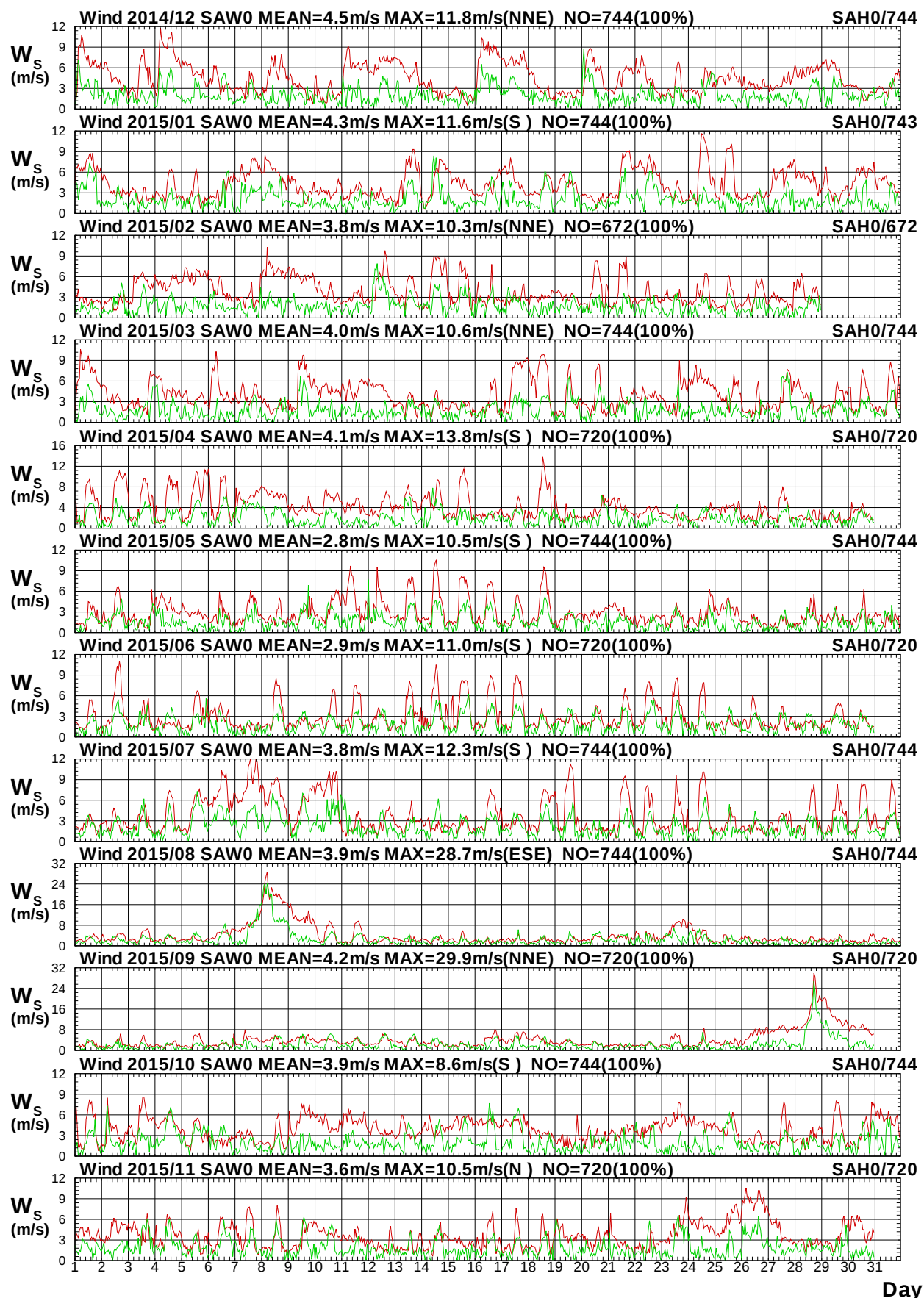


圖 1.5a 2015年每月宜蘭海域 W 站與 H 站風速比較圖

W14CSAW0.1HA W14CSAH0.1H0 W151SAW0.1HA W151SAH0.1H0 W152SAW0.1HA W152SAH0.1H0  
W153SAW0.1HA W153SAH0.1H0 W154SAW0.1HA W154SAH0.1H0 W155SAW0.1HA W155SAH0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

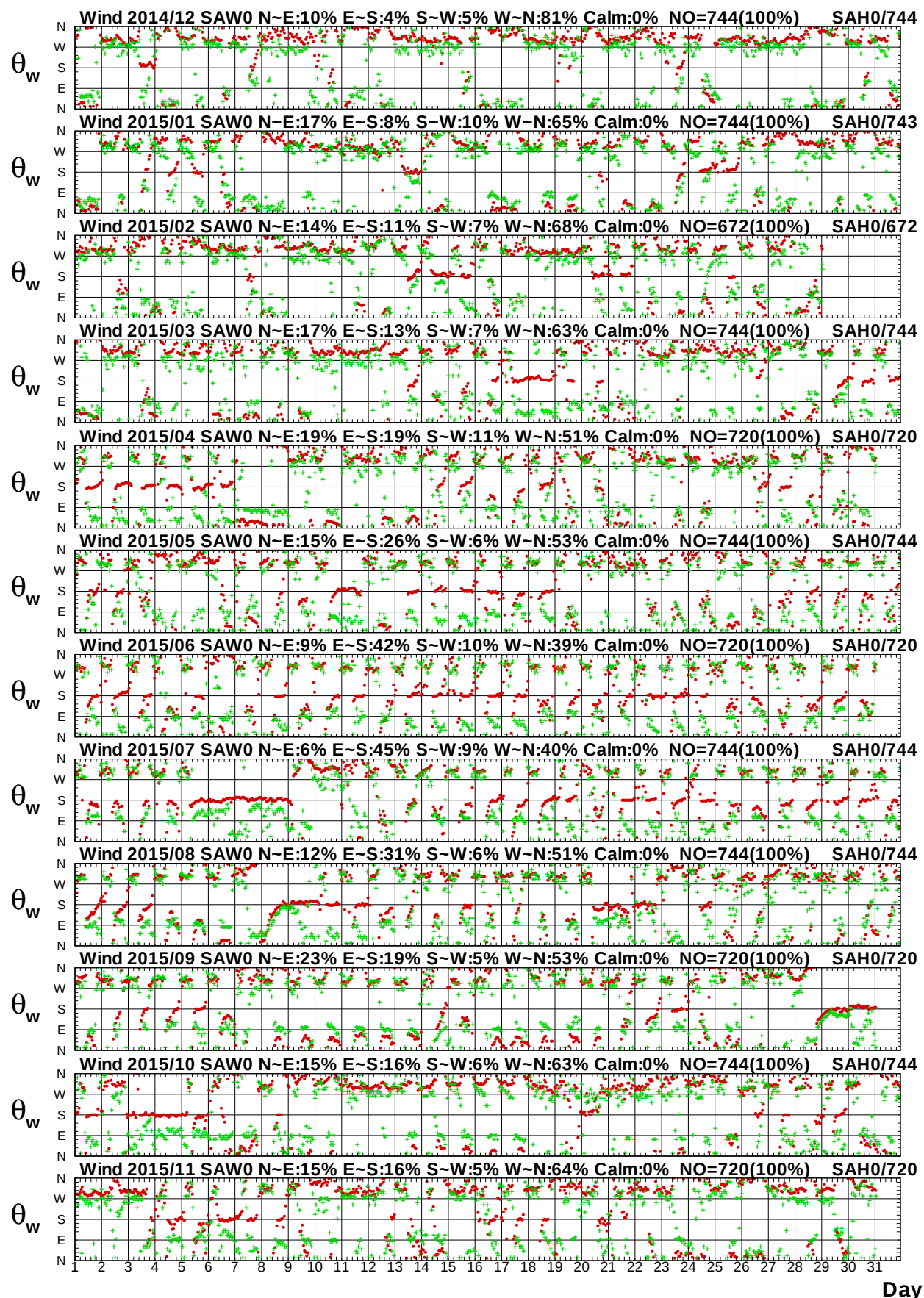


圖 1.5b 2015年每月宜蘭海域 W 站與 H 站風向比較圖

W14CSAW0.1HA W14CSAH0.1H0 W151SAW0.1HA W151SAH0.1H0 W152SAW0.1HA W152SAH0.1H0  
W153SAW0.1HA W153SAH0.1H0 W154SAW0.1HA W154SAH0.1H0 W155SAW0.1HA W155SAH0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

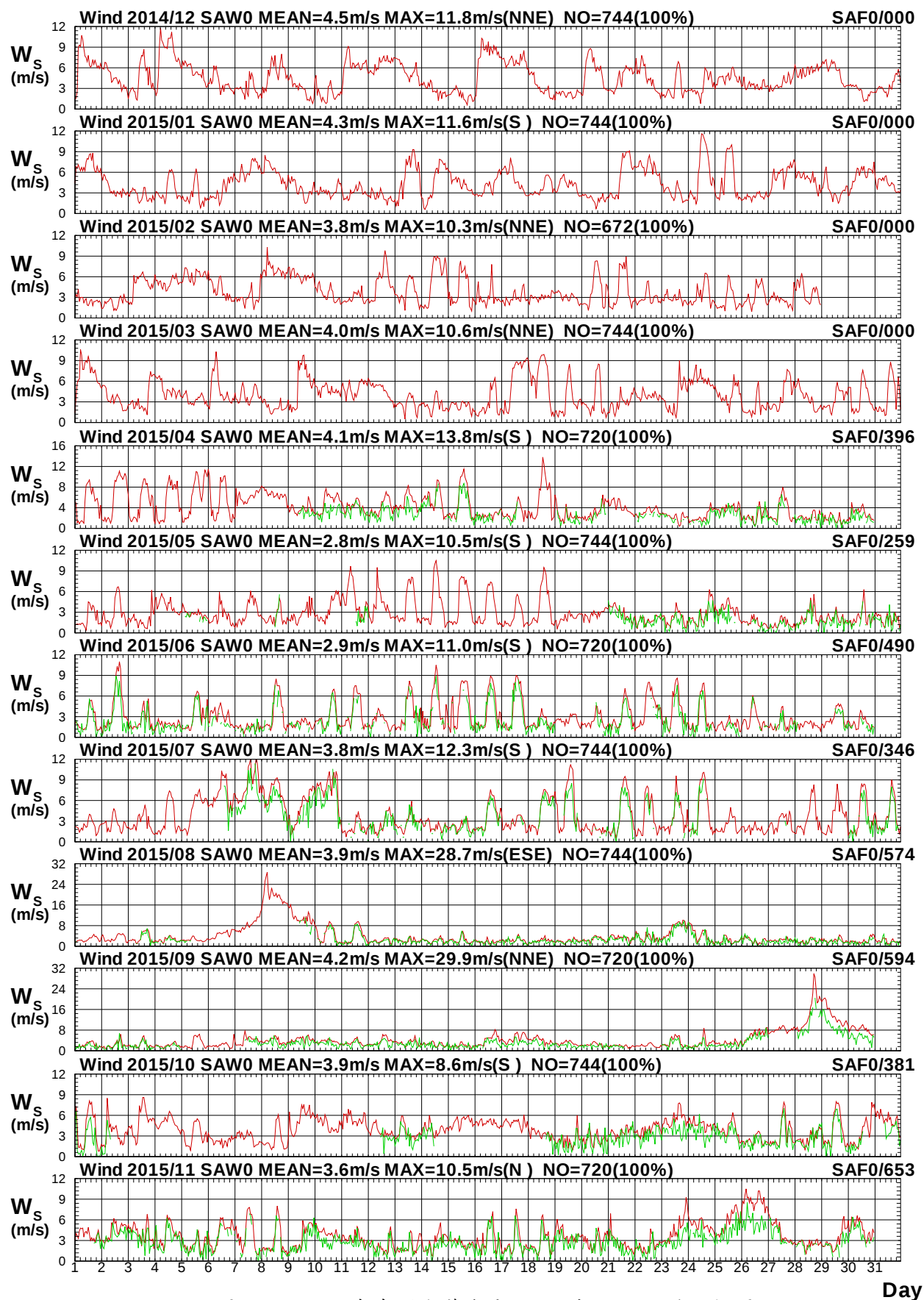


圖 1.6a 2015年每月宜蘭海域 W 站與 F 站風速比較圖

W14CSAW0.1HA W14CSAF0.1H0 W151SAW0.1HA W151SAF0.1H0 W152SAW0.1HA W152SAF0.1H0

W153SAW0.1HA W153SAF0.1H0 W154SAW0.1HA W154SAF0.1H0 W155SAW0.1HA W155SAF0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

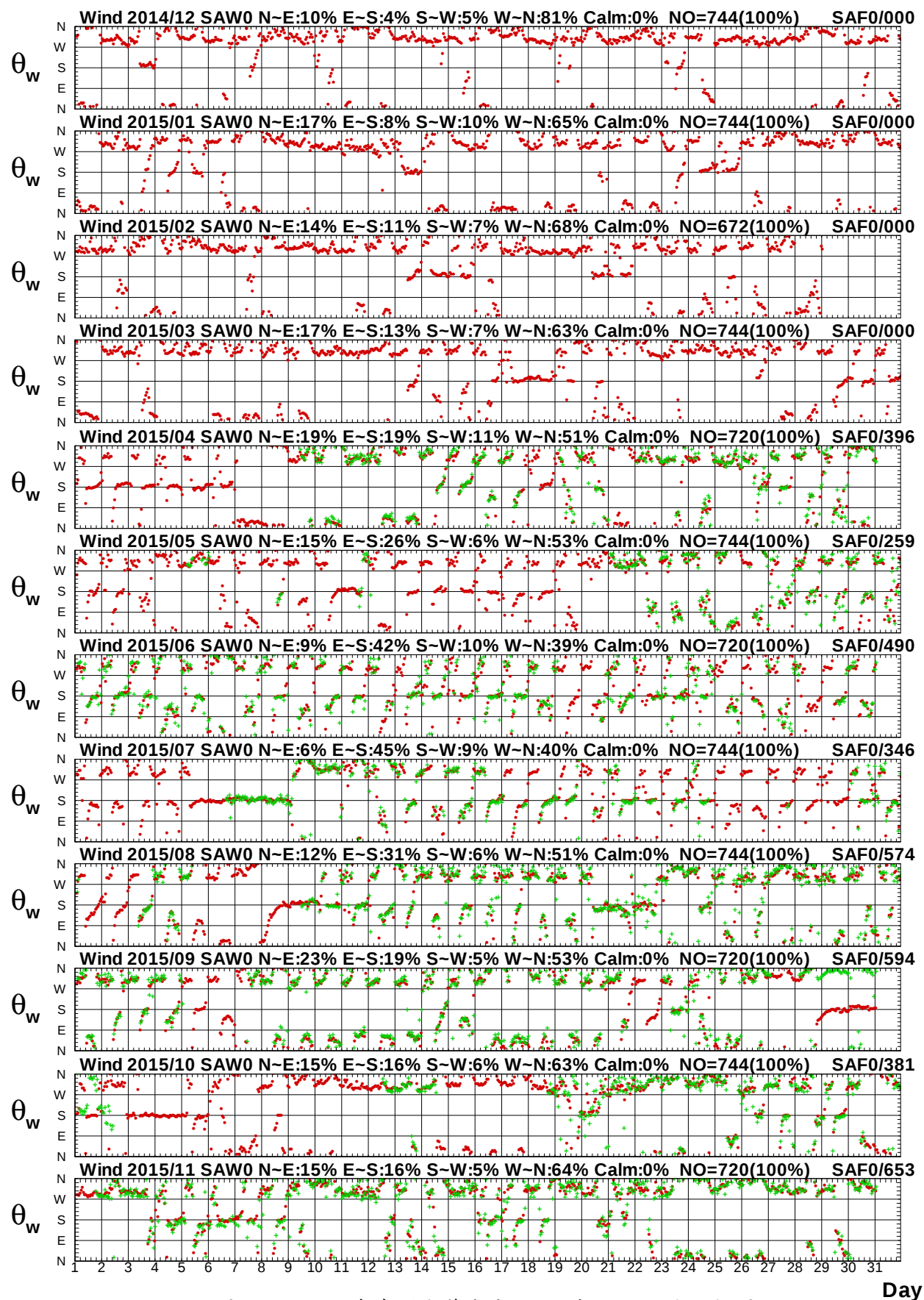


圖 1.6b 2015年每月宜蘭海域 W 站與 F 站風向比較圖

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W153SAW0.1HA W153SAF0.1H0 W154SAW0.1HA W154SAF0.1H0 W155SAW0.1HA W155SAF0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

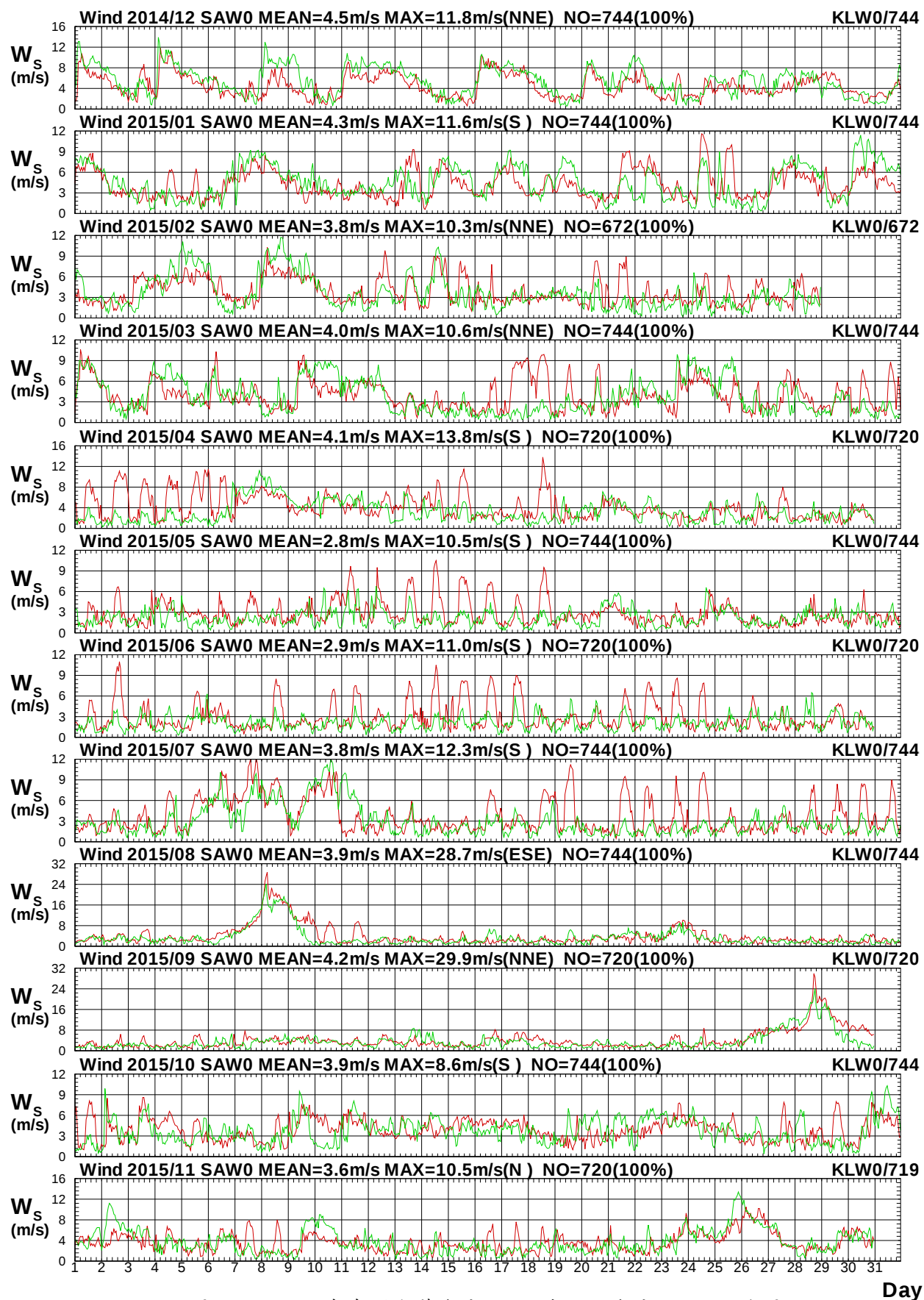


圖 1.7a 2015 年每月宜蘭海域 W 站與北端海域 W 站風速圖

W14CSAW0.1HA W14CKLRW0.1H0 W151SAW0.1HA W151KLRW0.1H0 W152SAW0.1HA W152KLRW0.1H0  
W153SAW0.1HA W153KLRW0.1H0 W154SAW0.1HA W154KLRW0.1H0 W155SAW0.1HA W155KLRW0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

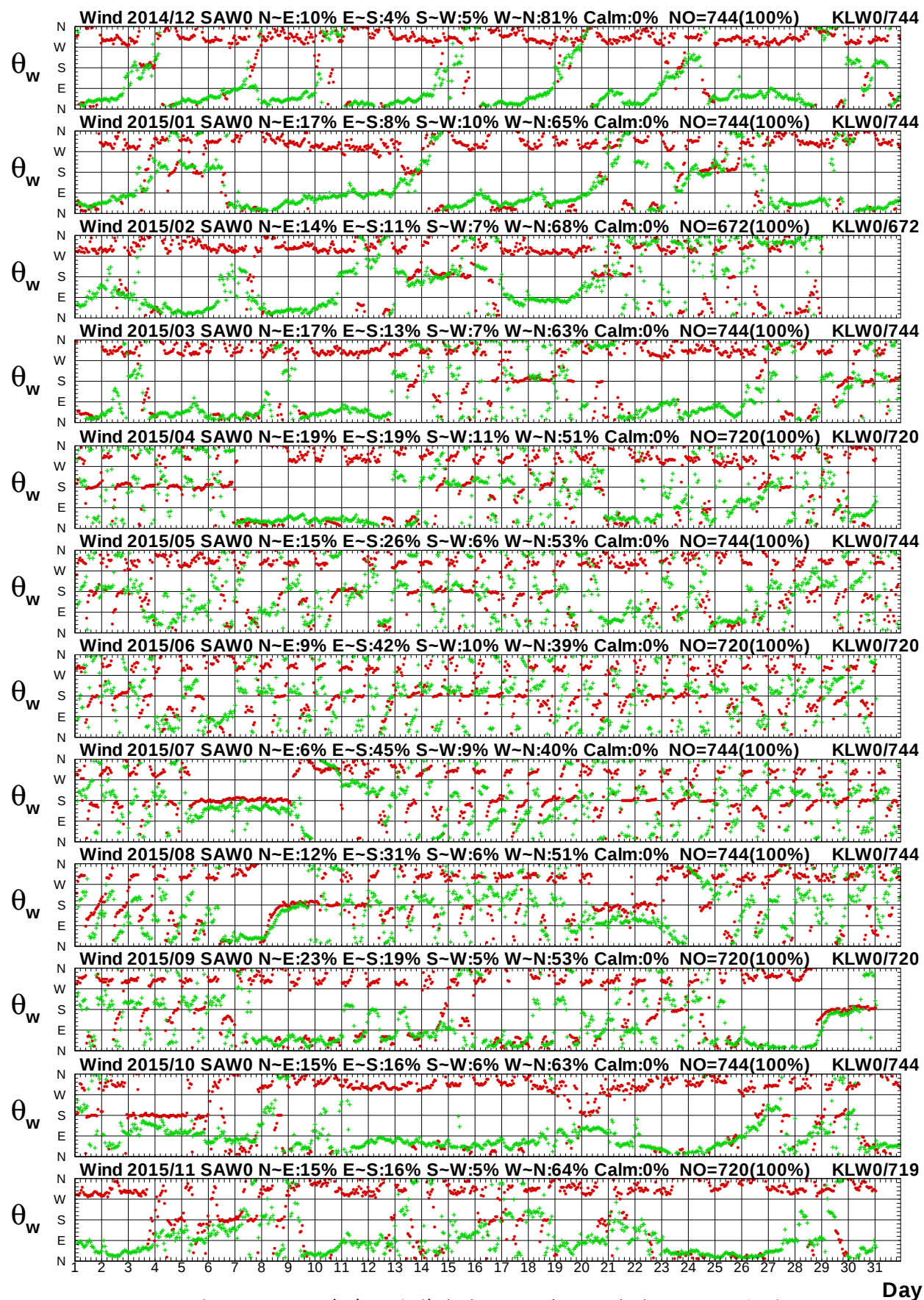


圖 1.7b 2015 年每月宜蘭海域 W 站與北端海域 W 站風向圖

W14CSAW0.1HA W14CKLW0.1H0 W151SAW0.1HA W151KLW0.1H0 W152SAW0.1HA W152KLW0.1H0  
W153SAW0.1HA W153KLW0.1H0 W154SAW0.1HA W154KLW0.1H0 W155SAW0.1HA W155KLW0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

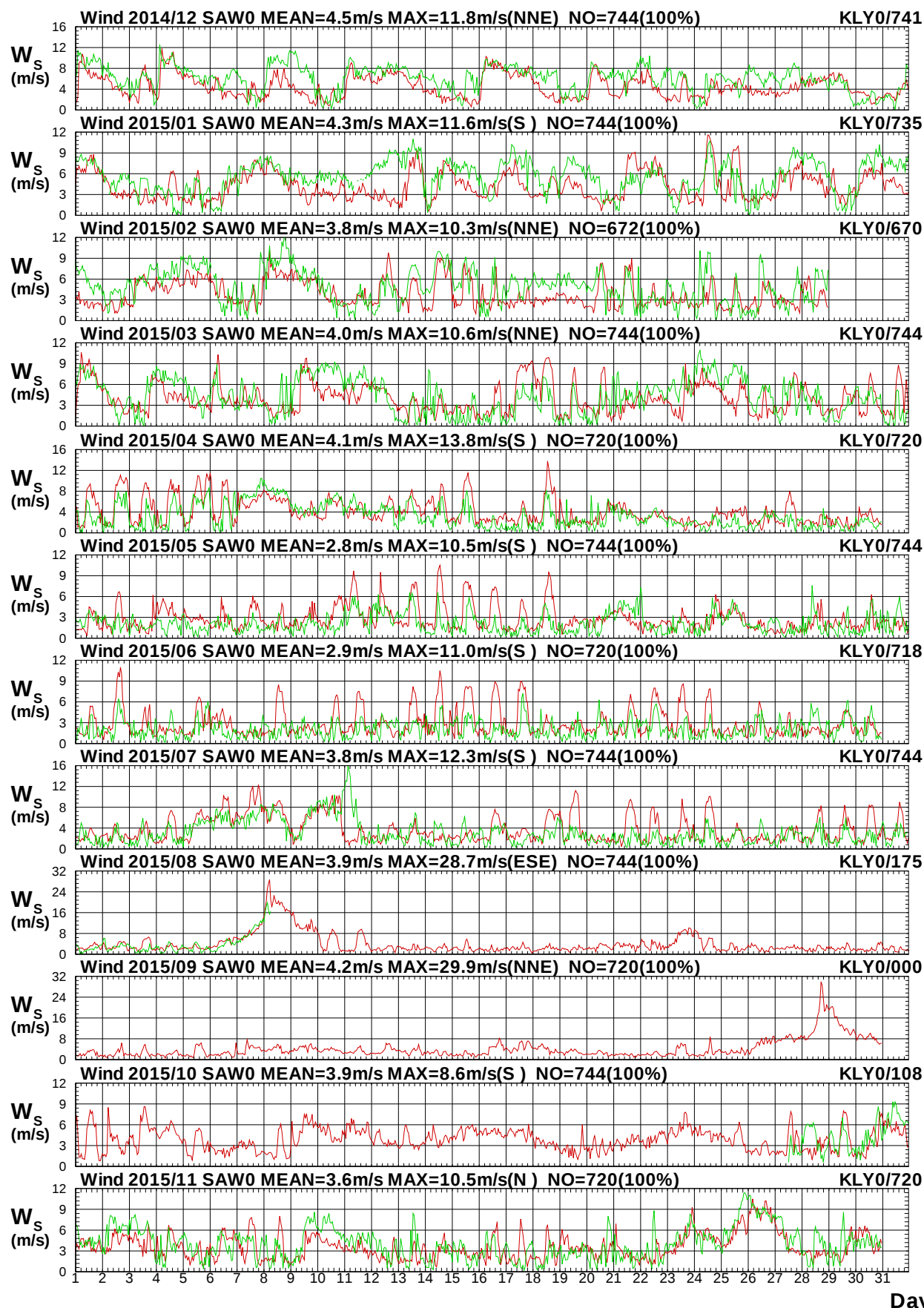


圖 1.8a 2015年每月宜蘭海域 W 站與北端海域 Y 站風速圖

W14CSAW0.1HA W14CKLY0.1H0 W151SAW0.1HA W151KLY0.1H0 W152SAW0.1HA W152KLY0.1H0

W153SAW0.1HA W153KLY0.1H0 W154SAW0.1HA W154KLY0.1H0 W155SAW0.1HA W155KLY0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

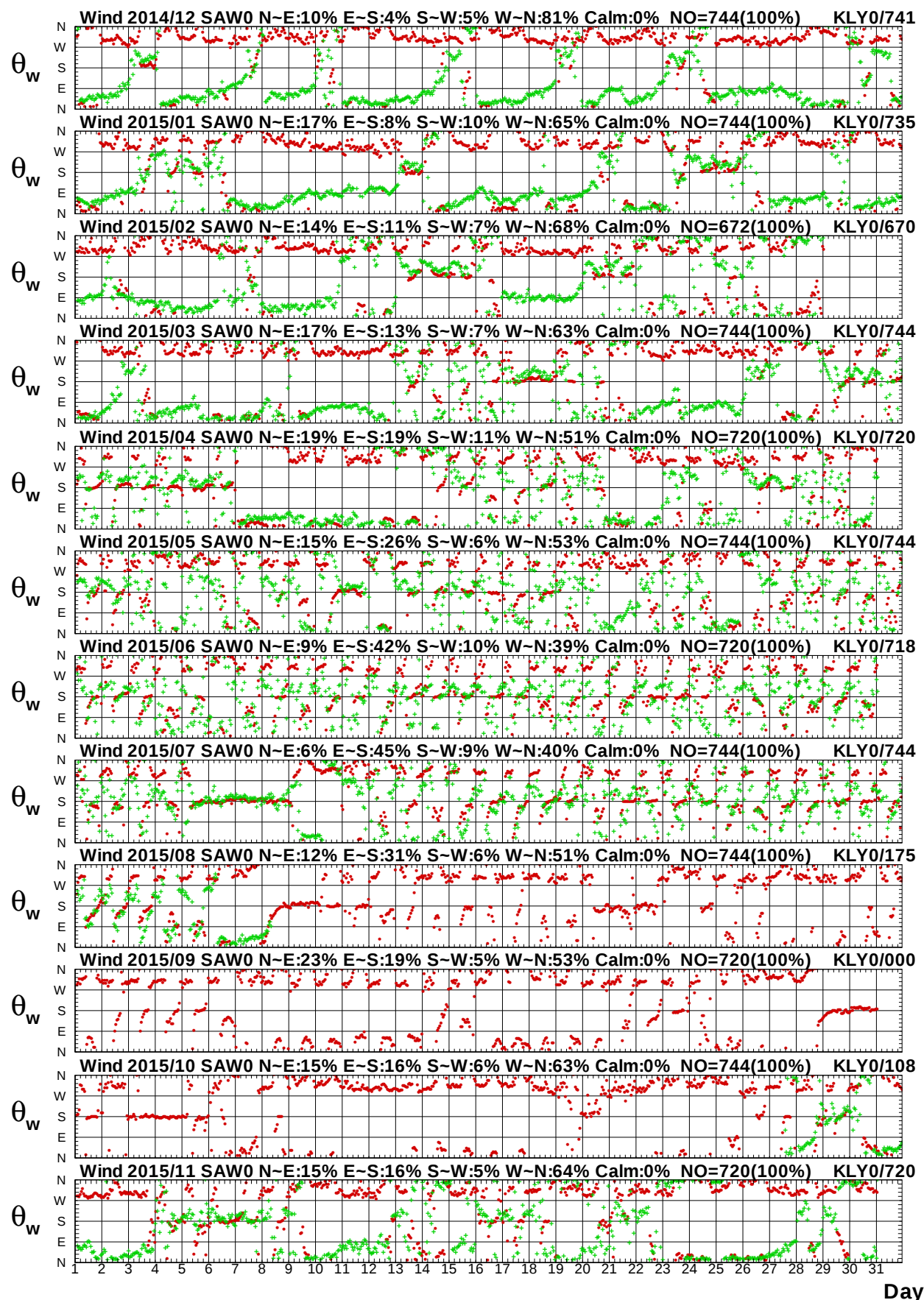


圖 1.8b 2015年每月宜蘭海域 W 站與北端海域 Y 站風向圖

W14CSAW0.1HA W14CKLY0.1H0 W151SAW0.1HA W151KLY0.1H0 W152SAW0.1HA W152KLY0.1H0

W153SAW0.1HA W153KLY0.1H0 W154SAW0.1HA W154KLY0.1H0 W155SAW0.1HA W155KLY0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

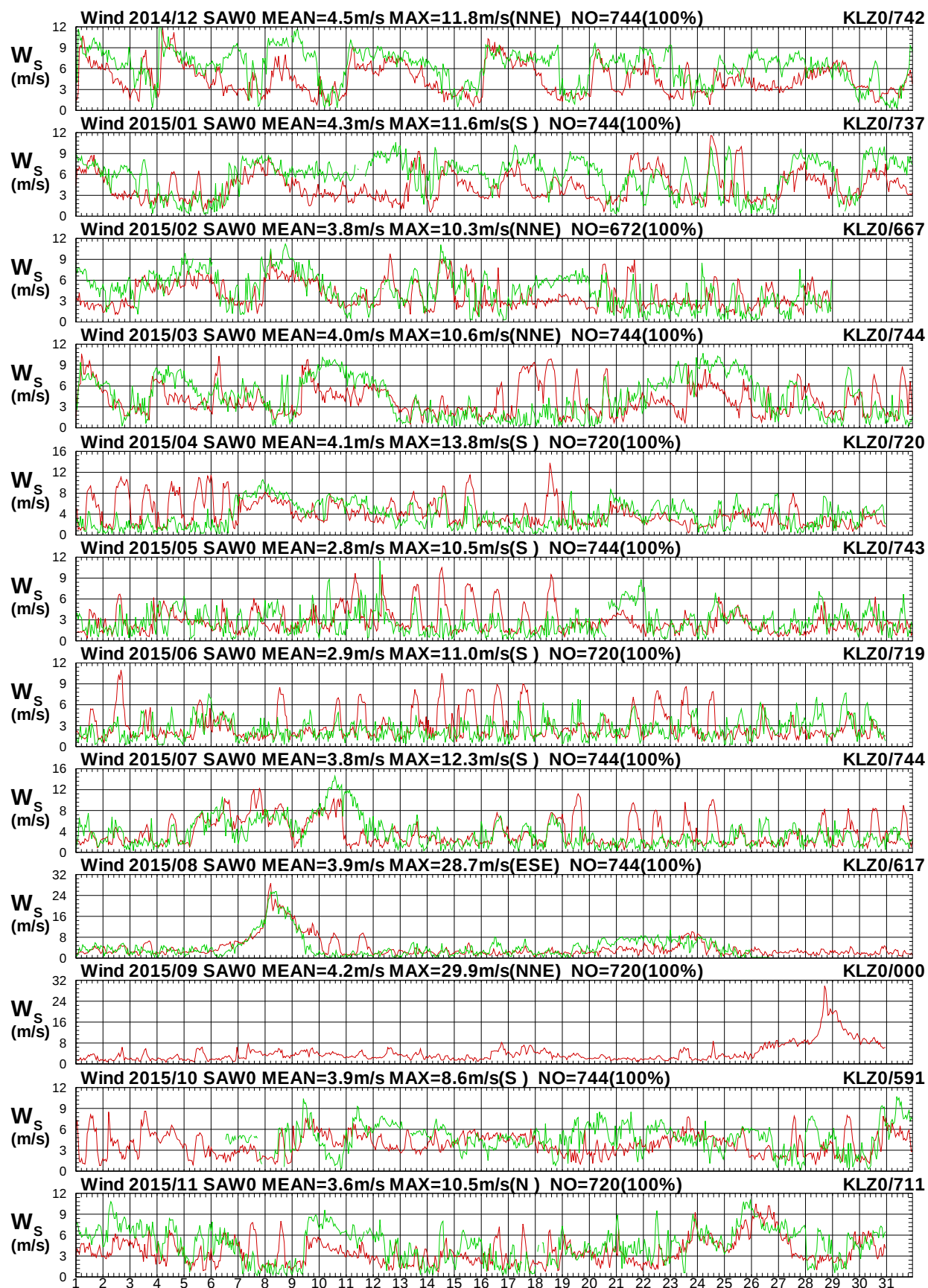


圖 1.9a 2015年每月宜蘭海域 W 站與北端海域 Z 站風速圖

W14CSAW0.1HA W14CKLZ0.1H0 W151SAW0.1HA W151KLZ0.1H0 W152SAW0.1HA W152KLZ0.1H0  
W153SAW0.1HA W153KLZ0.1H0 W154SAW0.1HA W154KLZ0.1H0 W155SAW0.1HA W155KLZ0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

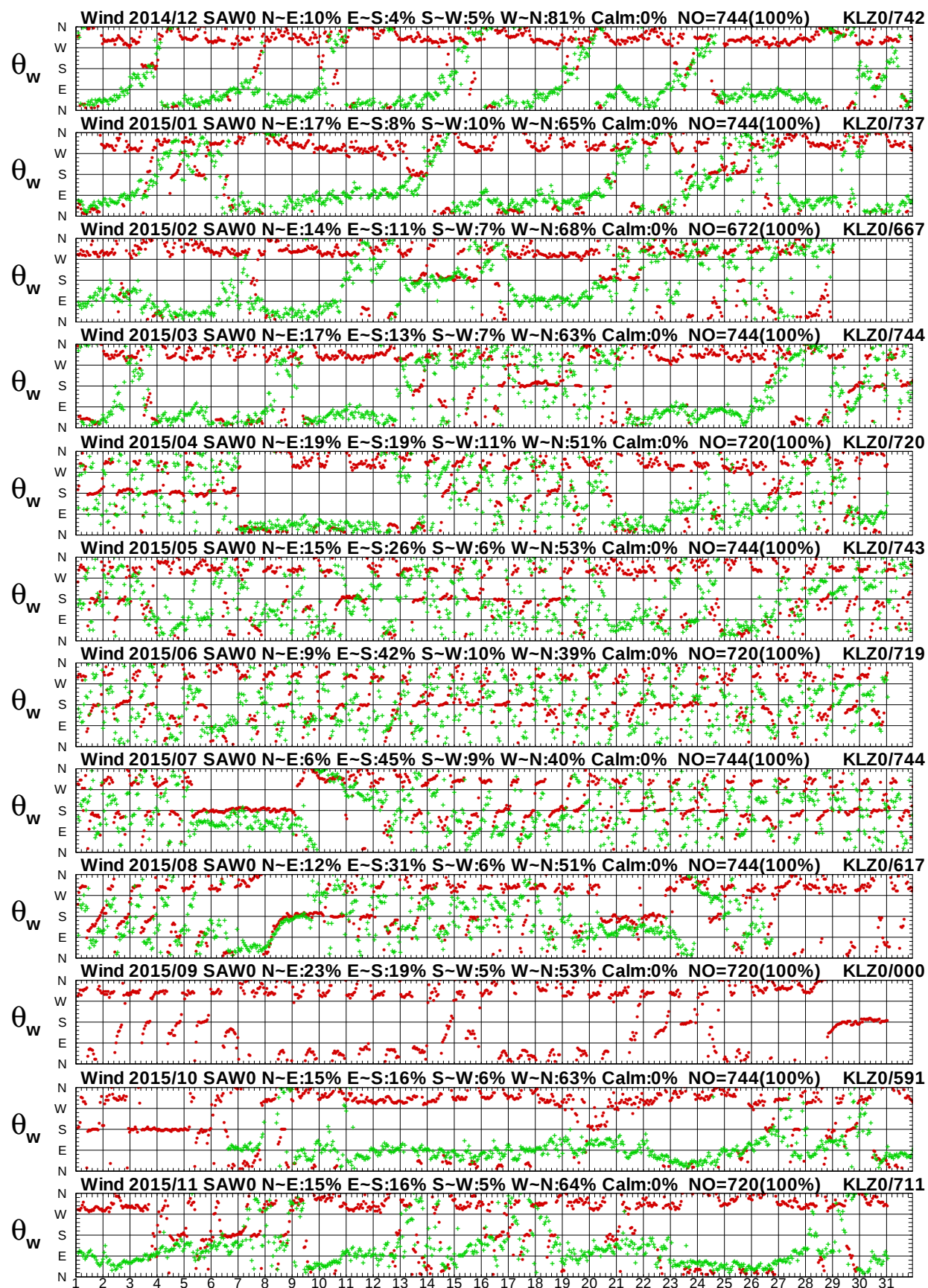


圖 1.9b 2015年每月宜蘭海域 W 站與北端海域 Z 站風向圖

W14CSAW0.1HA W14CKLZ0.1H0 W151SAW0.1HA W151KLZ0.1H0 W152SAW0.1HA W152KLZ0.1H0  
W153SAW0.1HA W153KLZ0.1H0 W154SAW0.1HA W154KLZ0.1H0 W155SAW0.1HA W155KLZ0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

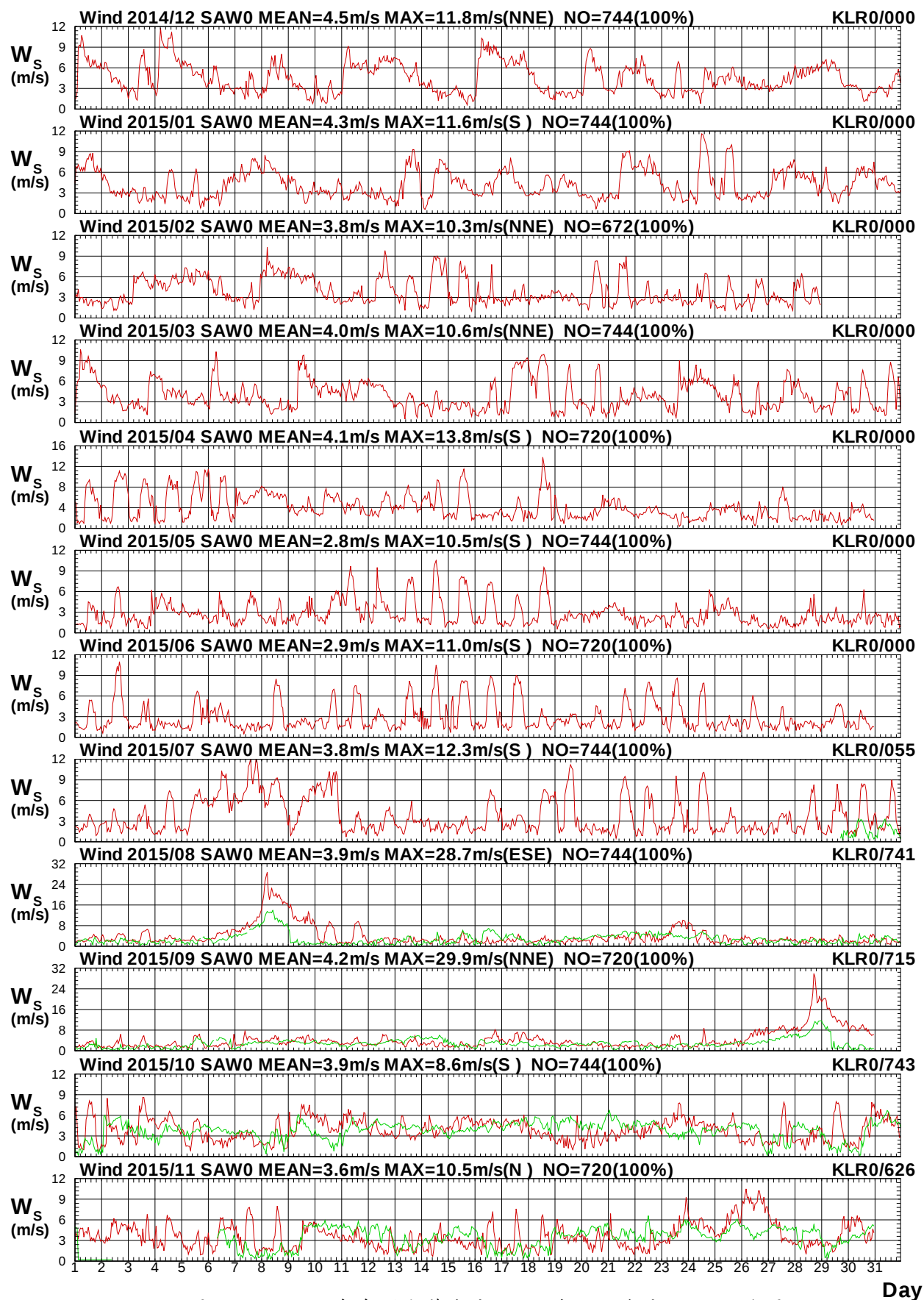


圖 1.10a 2015年每月宜蘭海域 W 站與北端海域 R 站風速圖

W14CSAW0.1HA W14CKLR0.1H0 W151SAW0.1HA W151KLR0.1H0 W152SAW0.1HA W152KLR0.1H0  
W153SAW0.1HA W153KLR0.1H0 W154SAW0.1HA W154KLR0.1H0 W155SAW0.1HA W155KLR0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

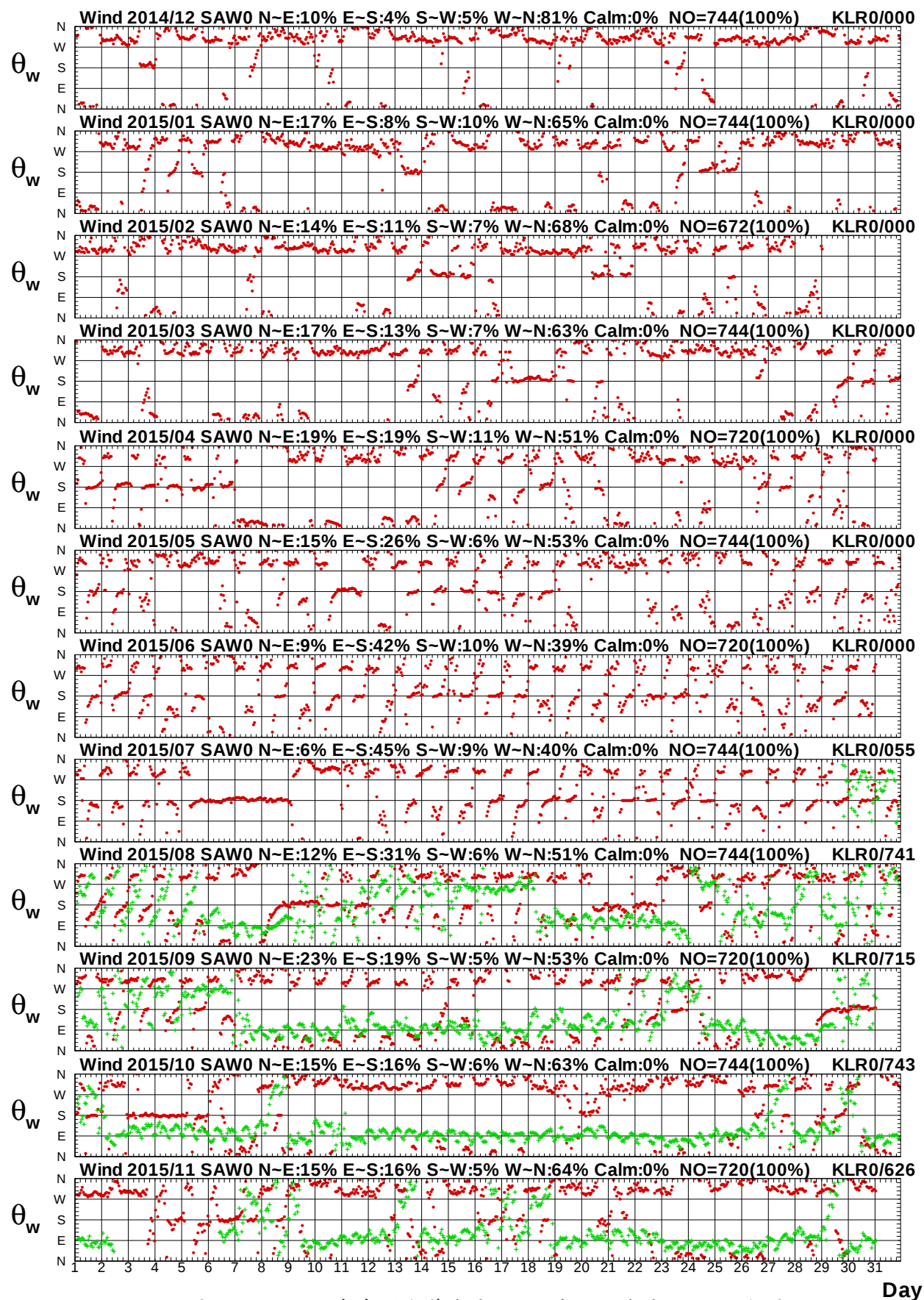


圖 1.10b 2015年每月宜蘭海域 W 站與北端海域 R 站風向圖

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W153SAW0.1HA W153KLR0.1H0 W154SAW0.1HA W154KLR0.1H0 W155SAW0.1HA W155KLR0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

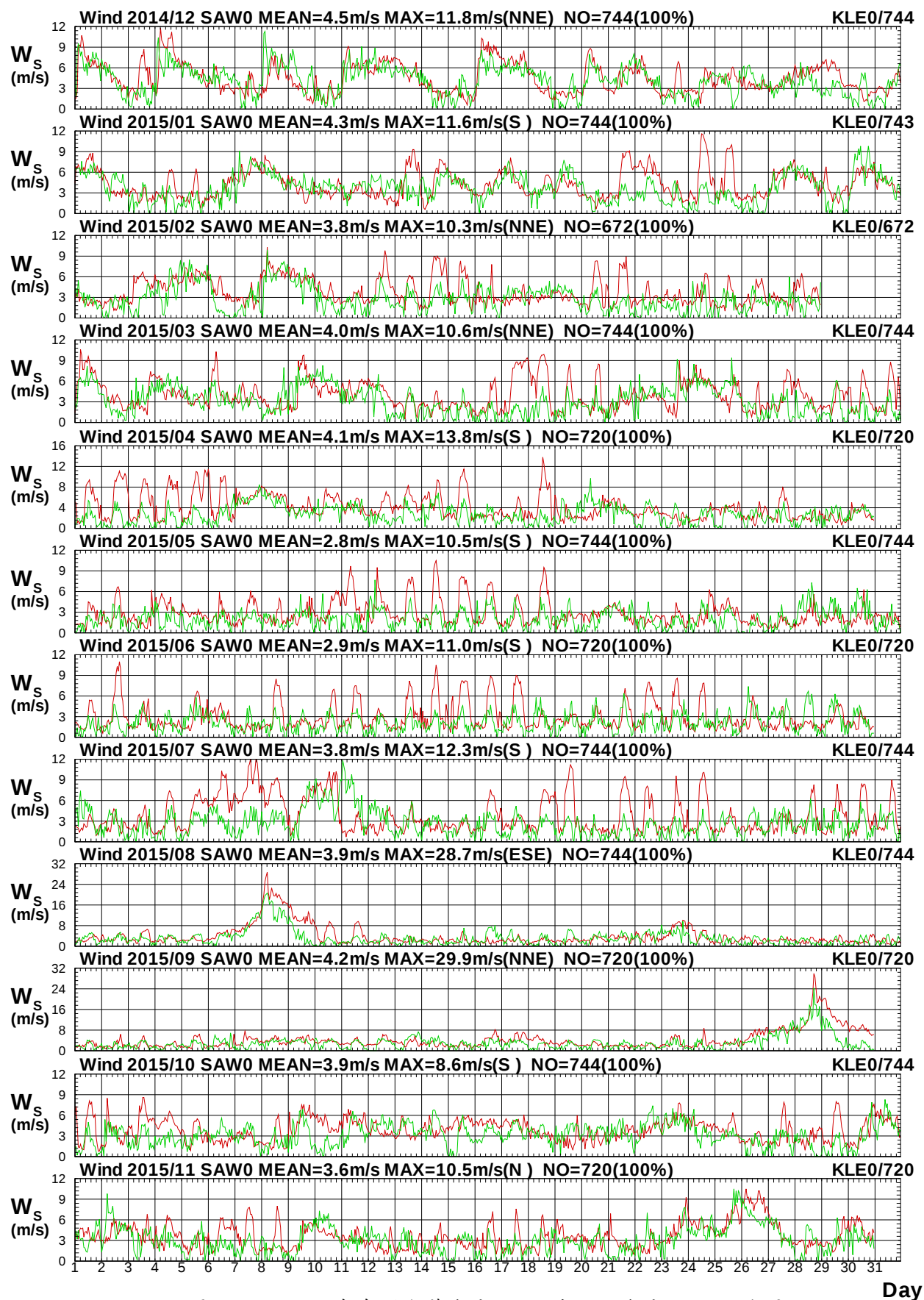


圖 1.11a 2015年每月宜蘭海域 W 站與北端海域 E 站風速圖

W14CSAW0.1HA W14CKLE0.1H0 W151SAW0.1HA W151KLE0.1H0 W152SAW0.1HA W152KLE0.1H0

W153SAW0.1HA W153KLE0.1H0 W154SAW0.1HA W154KLE0.1H0 W155SAW0.1HA W155KLE0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

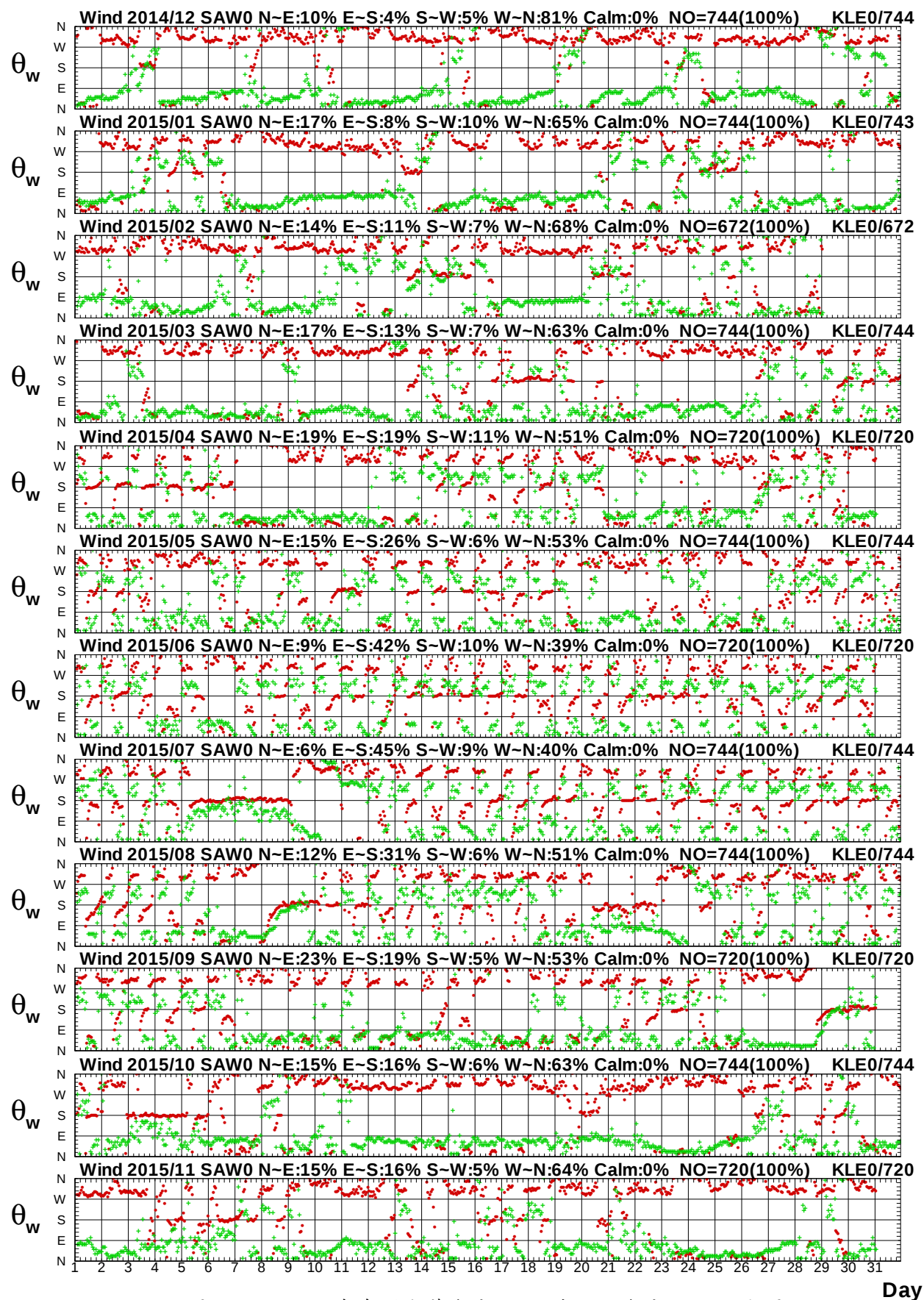


圖 1.11b 2015年每月宜蘭海域 W 站與北端海域 E 站風向圖

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W153SAW0.1HA W153KLE0.1H0 W154SAW0.1HA W154KLE0.1H0 W155SAW0.1HA W155KLE0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

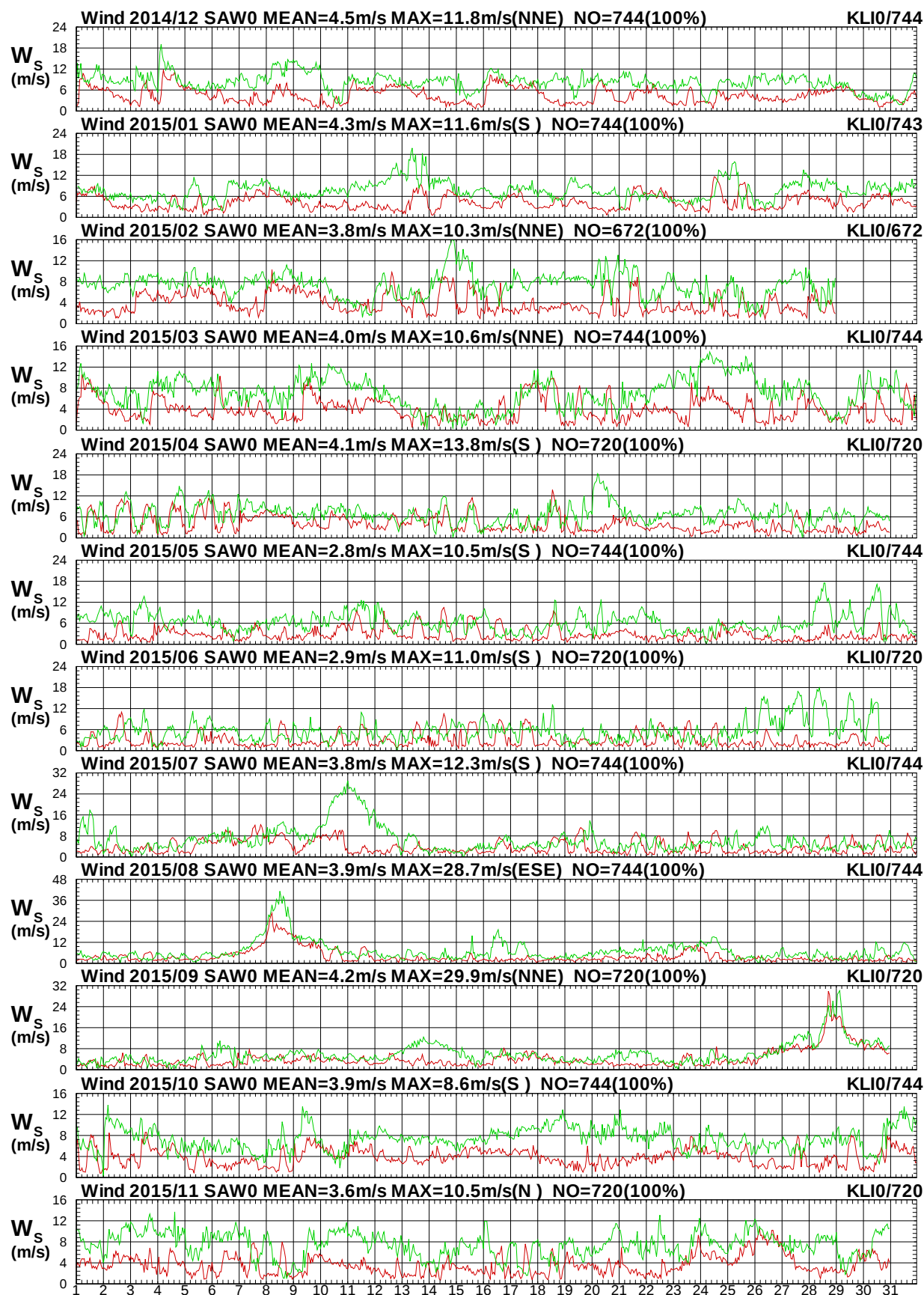


圖 1.12a 2015年每月宜蘭海域 W 站與北端海域 I 站風速圖

W14CSAW0.1HA W14CKLI0.1H0 W151SAW0.1HA W151KLI0.1H0 W152SAW0.1HA W152KLI0.1H0  
W153SAW0.1HA W153KLI0.1H0 W154SAW0.1HA W154KLI0.1H0 W155SAW0.1HA W155KLI0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

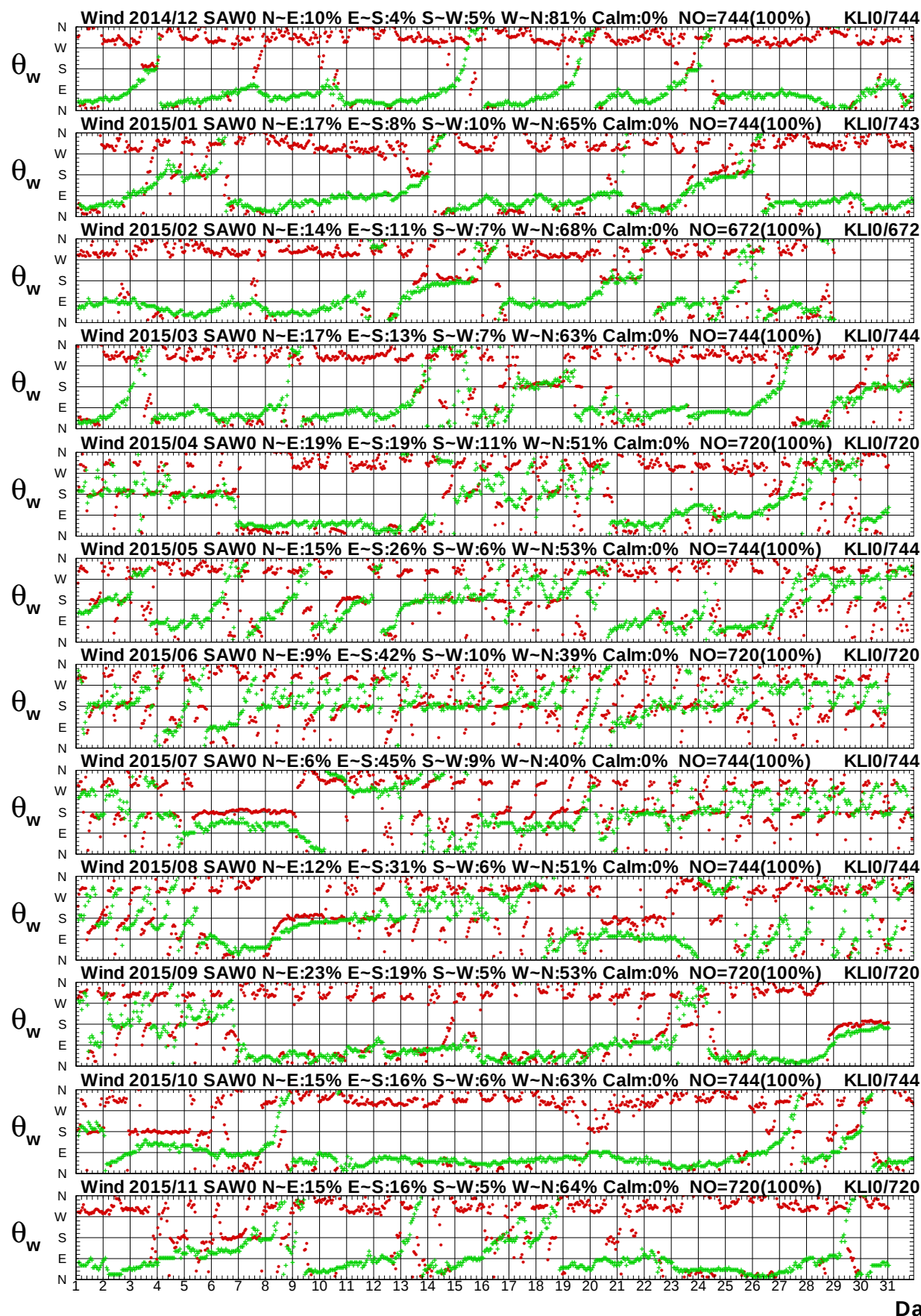


圖 1.12b 2015年每月宜蘭海域 W 站與北端海域 I 站風向圖

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W153SAW0.1HA W153KLI0.1H0 W154SAW0.1HA W154KLI0.1H0 W155SAW0.1HA W155KLI0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

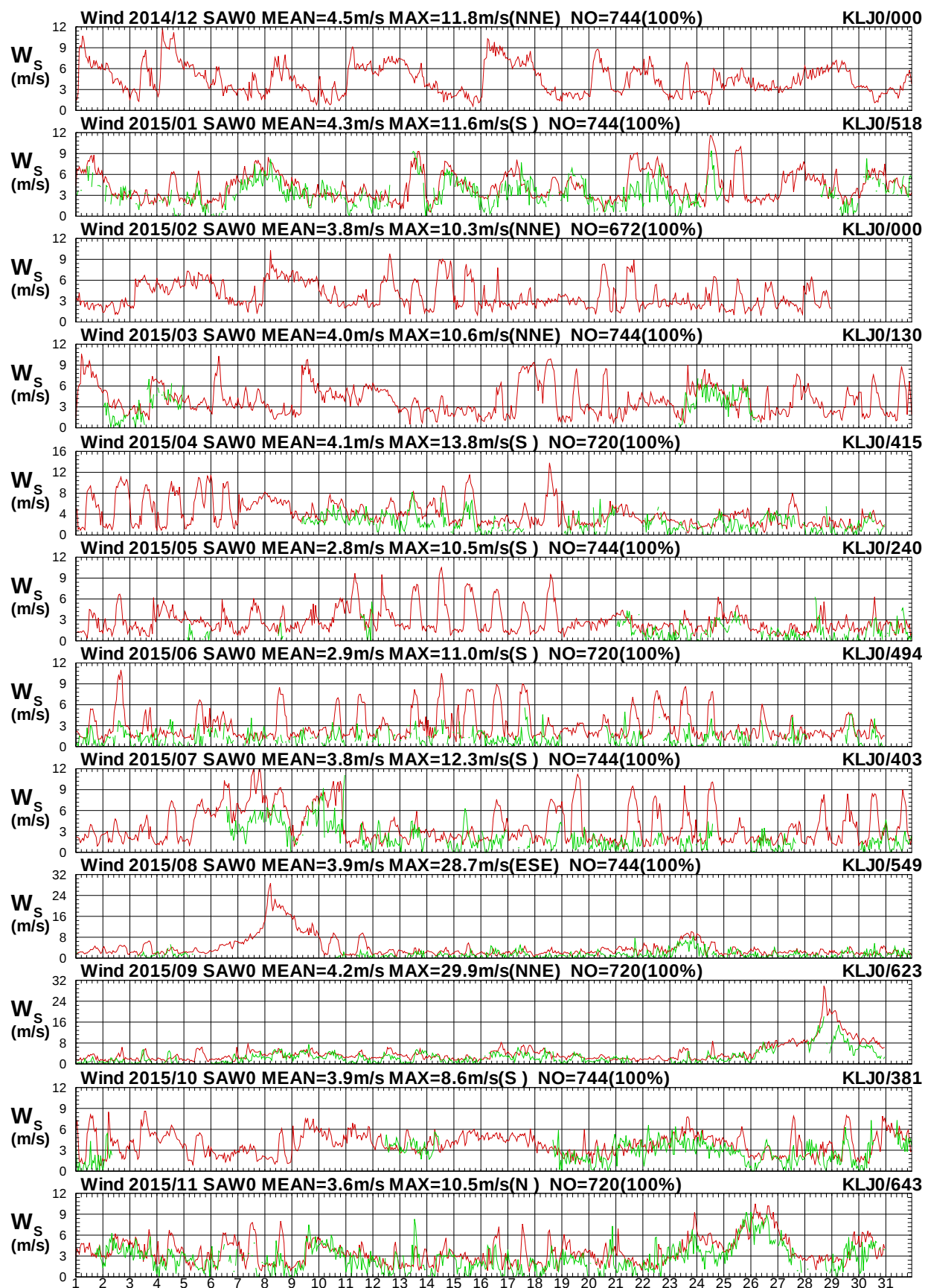


圖 1.13a 2015年每月宜蘭海域 W 站與北端海域 J 站風速圖

W14CSAW0.1HA W14CKLJ0.1H0 W151SAW0.1HA W151KLJ0.1H0 W152SAW0.1HA W152KLJ0.1H0  
W153SAW0.1HA W153KLJ0.1H0 W154SAW0.1HA W154KLJ0.1H0 W155SAW0.1HA W155KLJ0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

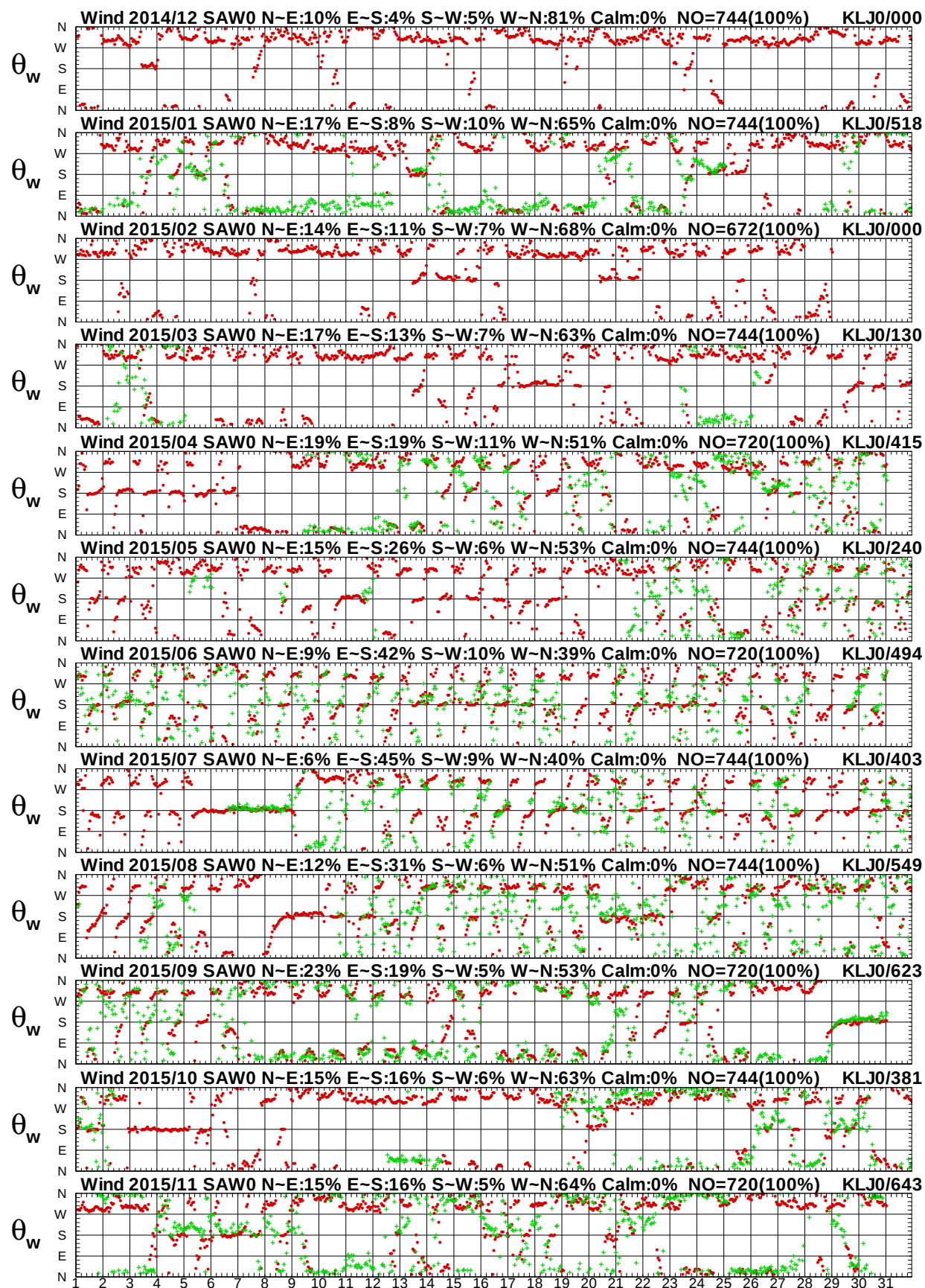


圖 1.13b 2015 年每月宜蘭海域 W 站與北端海域 J 站風向圖

W14CSAW0.1HA W14CKLJ0.1H0 W151SAW0.1HA W151KLJ0.1H0 W152SAW0.1HA W152KLJ0.1H0  
W153SAW0.1HA W153KLJ0.1H0 W154SAW0.1HA W154KLJ0.1H0 W155SAW0.1HA W155KLJ0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

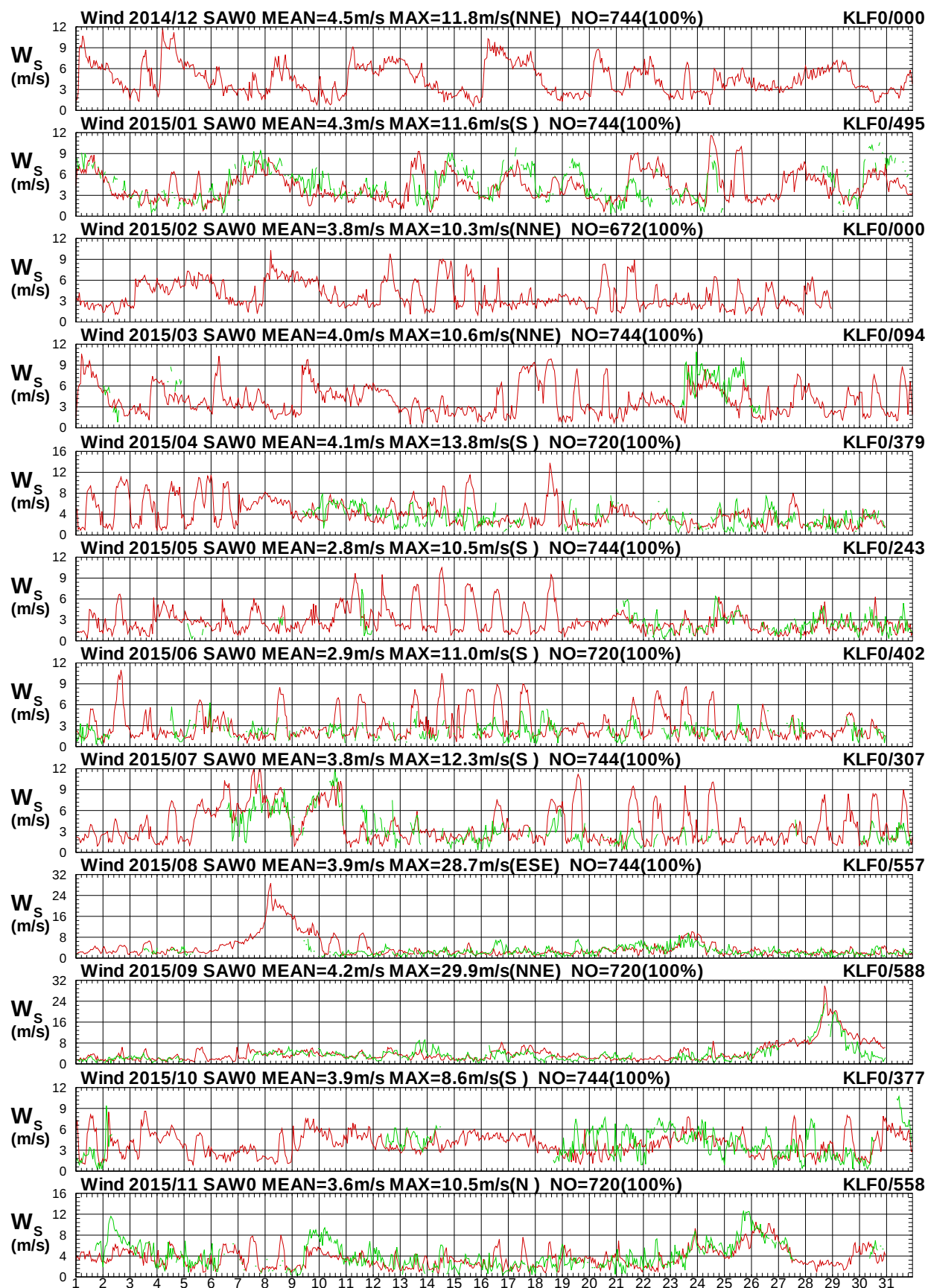


圖 1.14a 2015年每月宜蘭海域 W 站與北端海域 F 站風速圖

W14CSAW0.1HA W14CKLF0.1H0 W151SAW0.1HA W151KLF0.1H0 W152SAW0.1HA W152KLF0.1H0  
W153SAW0.1HA W153KLF0.1H0 W154SAW0.1HA W154KLF0.1H0 W155SAW0.1HA W155KLF0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

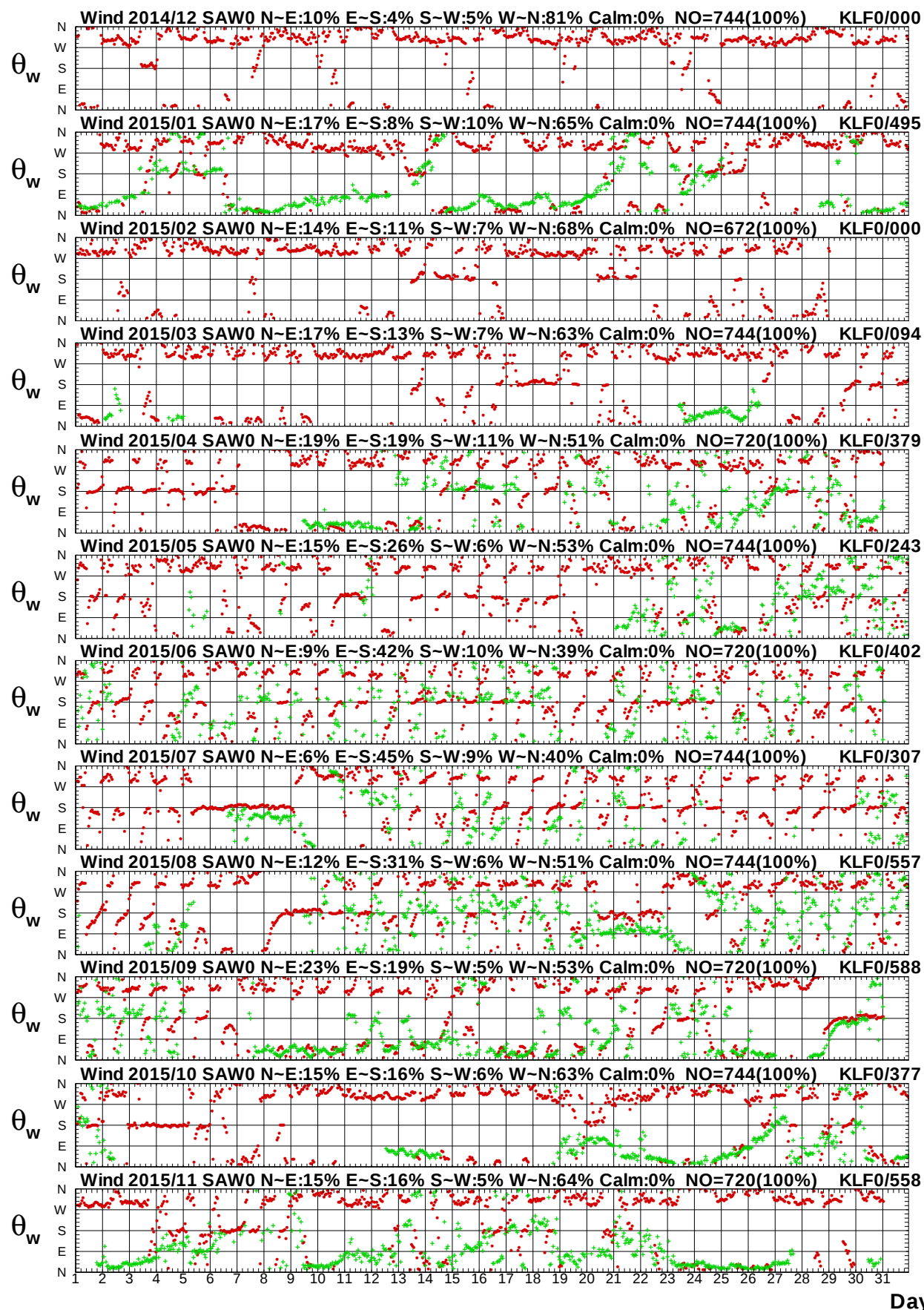


圖 1.14b 2015年每月宜蘭海域 W 站與北端海域 F 站風向圖

W14CSAW0.1HA W14CKLF0.1H0 W151SAW0.1HA W151KLF0.1H0 W152SAW0.1HA W152KLF0.1H0  
W153SAW0.1HA W153KLF0.1H0 W154SAW0.1HA W154KLF0.1H0 W155SAW0.1HA W155KLF0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

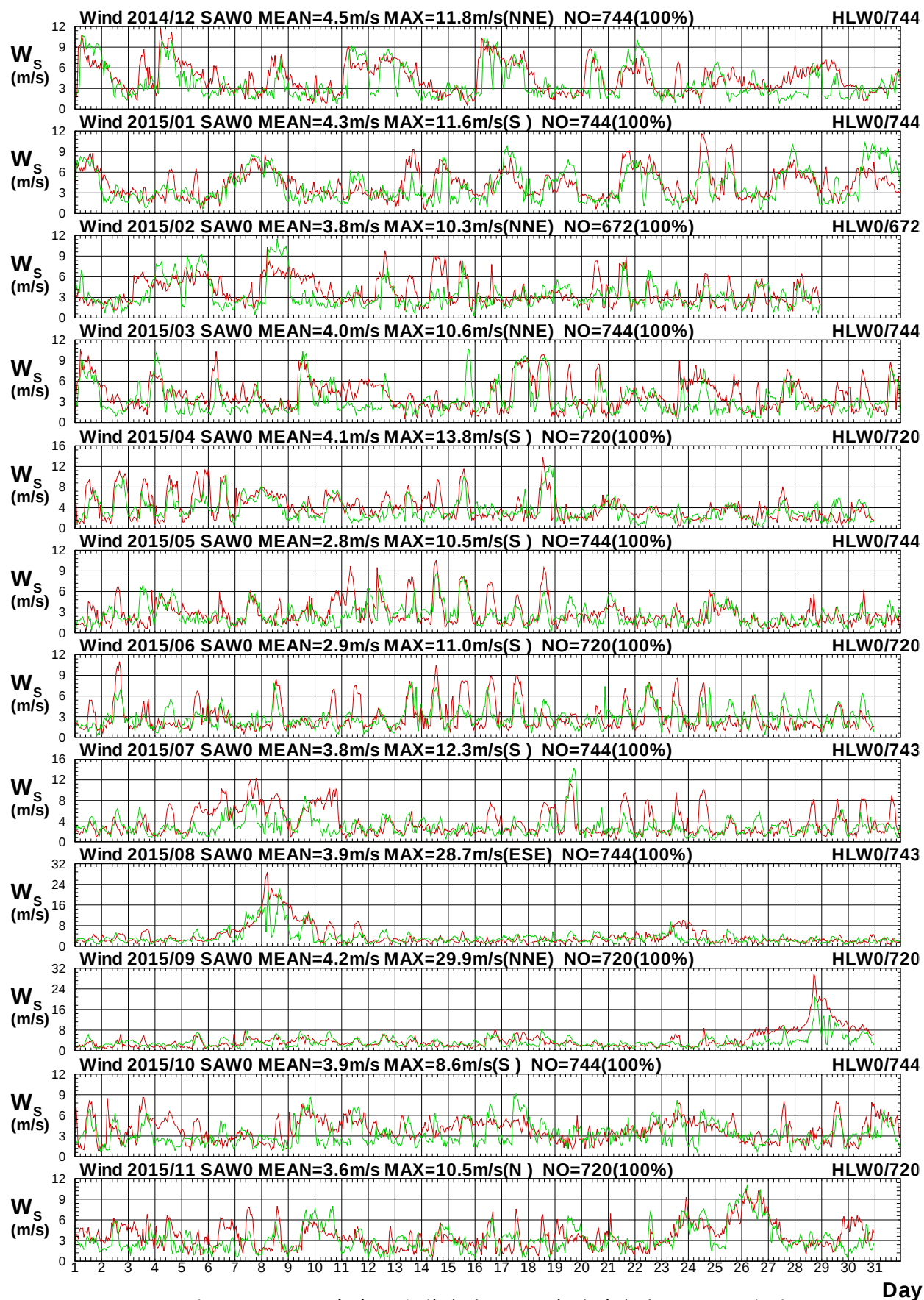


圖 1.15a 2015年每月宜蘭海域 W 站與花蓮海域 W 站風速圖

W14CSAW0.1HA W14CHLW0.1H0 W151SAW0.1HA W151HLW0.1H0 W152SAW0.1HA W152HLW0.1H0

W153SAW0.1HA W153HLW0.1H0 W154SAW0.1HA W154HLW0.1H0 W155SAW0.1HA W155HLW0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

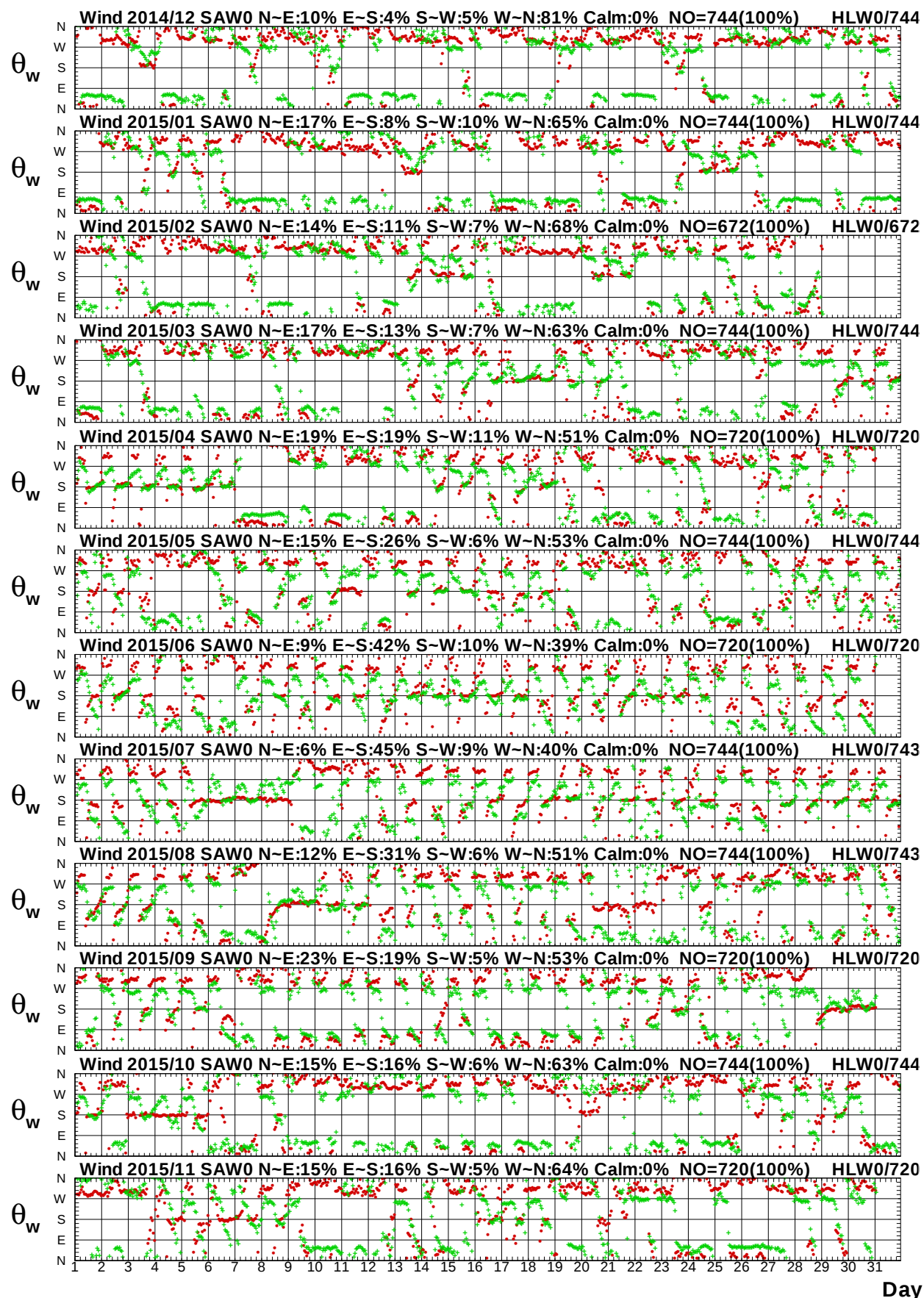


圖 1.15b 2015年每月宜蘭海域 W 站與花蓮海域 W 站風向圖

W14CSAW0.1HA W14CHLW0.1H0 W151SAW0.1HA W151HLW0.1H0 W152SAW0.1HA W152HLW0.1H0

W153SAW0.1HA W153HLW0.1H0 W154SAW0.1HA W154HLW0.1H0 W155SAW0.1HA W155HLW0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

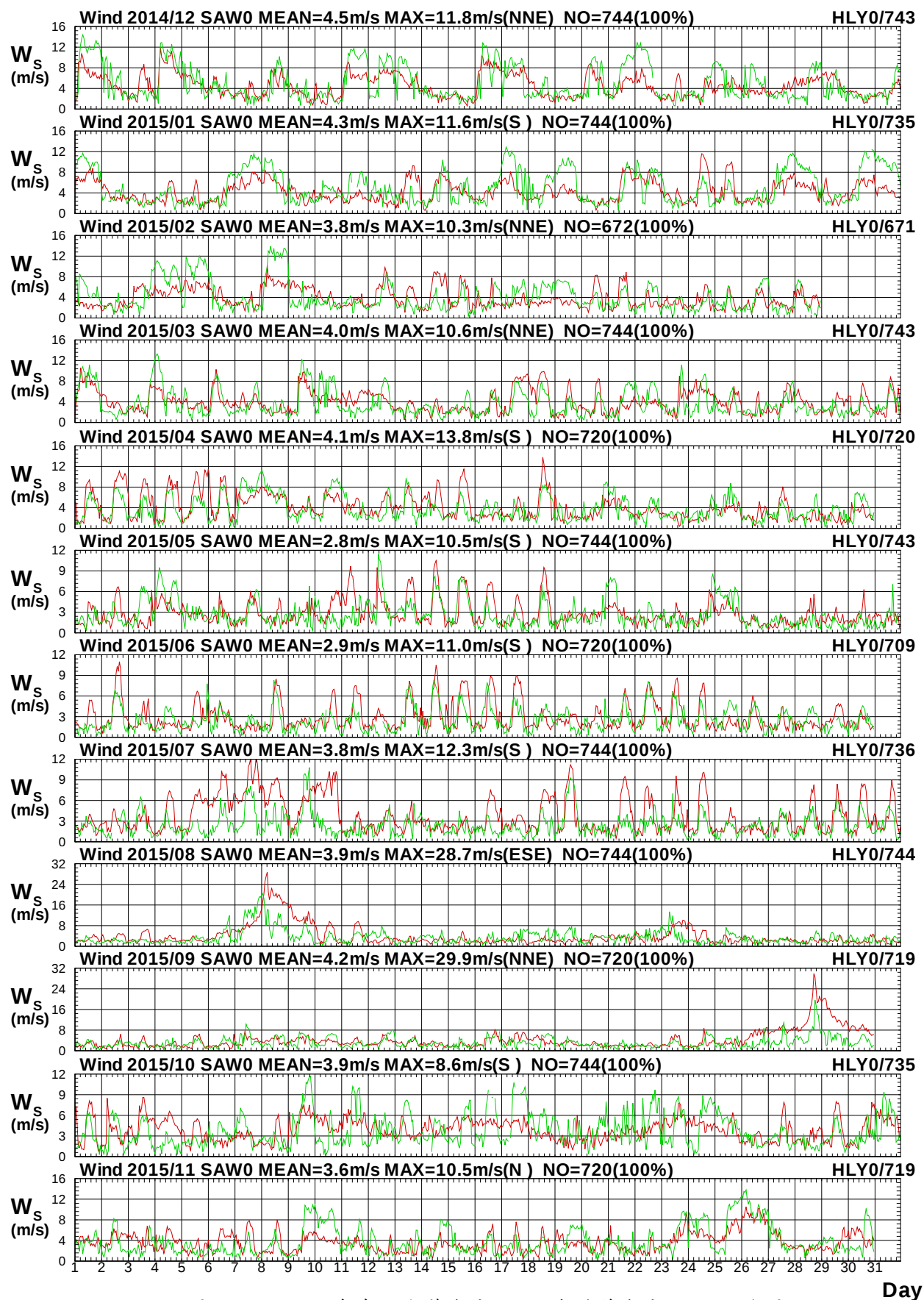


圖 1.16a 2015年每月宜蘭海域 W 站與花蓮海域 Y 站風速圖

W14CSAW0.1HA W14CHLY0.1H0 W151SAW0.1HA W151HLY0.1H0 W152SAW0.1HA W152HLY0.1H0

W153SAW0.1HA W153HLY0.1H0 W154SAW0.1HA W154HLY0.1H0 W155SAW0.1HA W155HLY0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

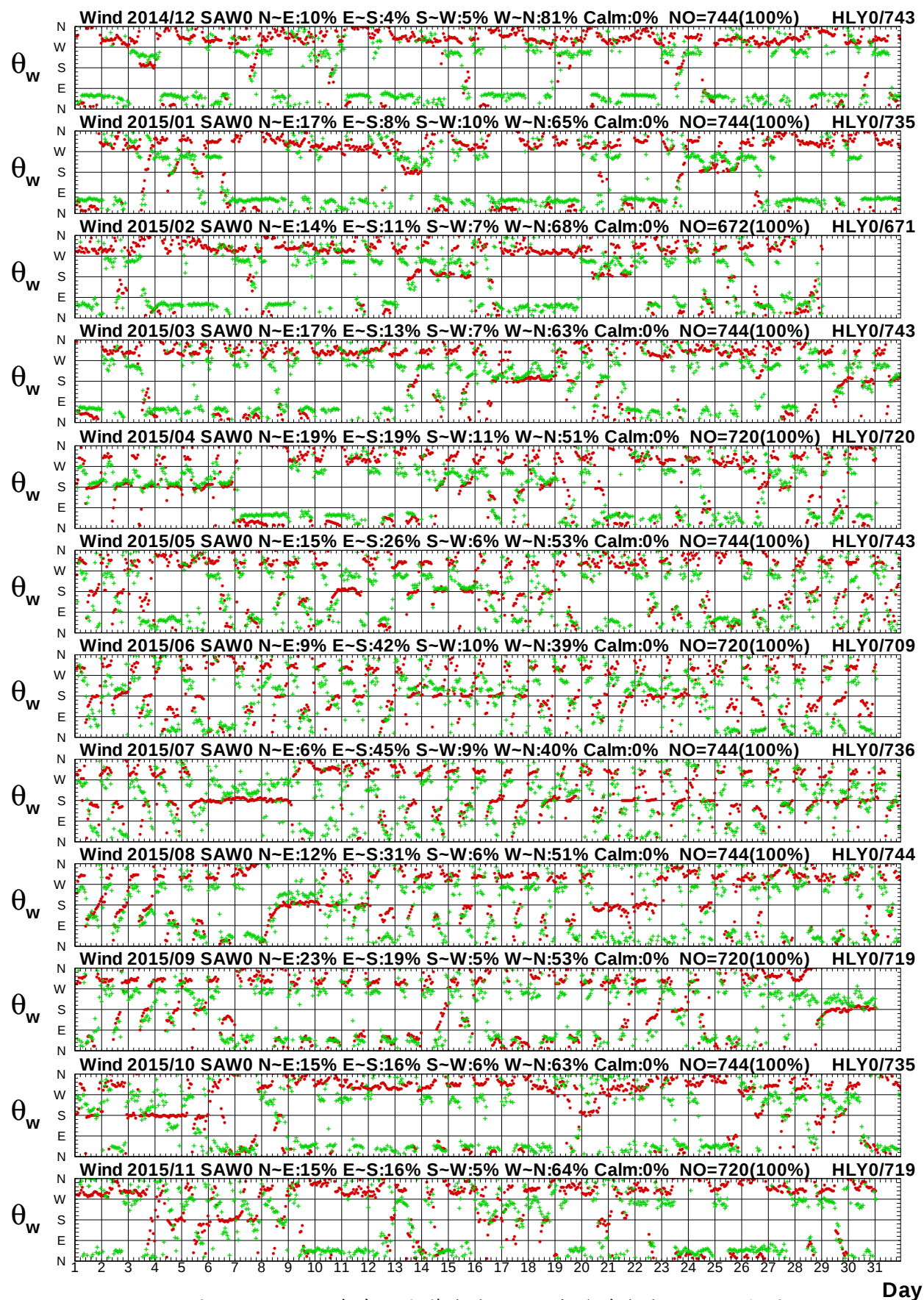


圖 1.16b 2015年每月宜蘭海域 W 站與花蓮海域 Y 站風向圖

W14CSAW0.1HA W14CHLY0.1H0 W151SAW0.1HA W151HLY0.1H0 W152SAW0.1HA W152HLY0.1H0

W153SAW0.1HA W153HLY0.1H0 W154SAW0.1HA W154HLY0.1H0 W155SAW0.1HA W155HLY0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

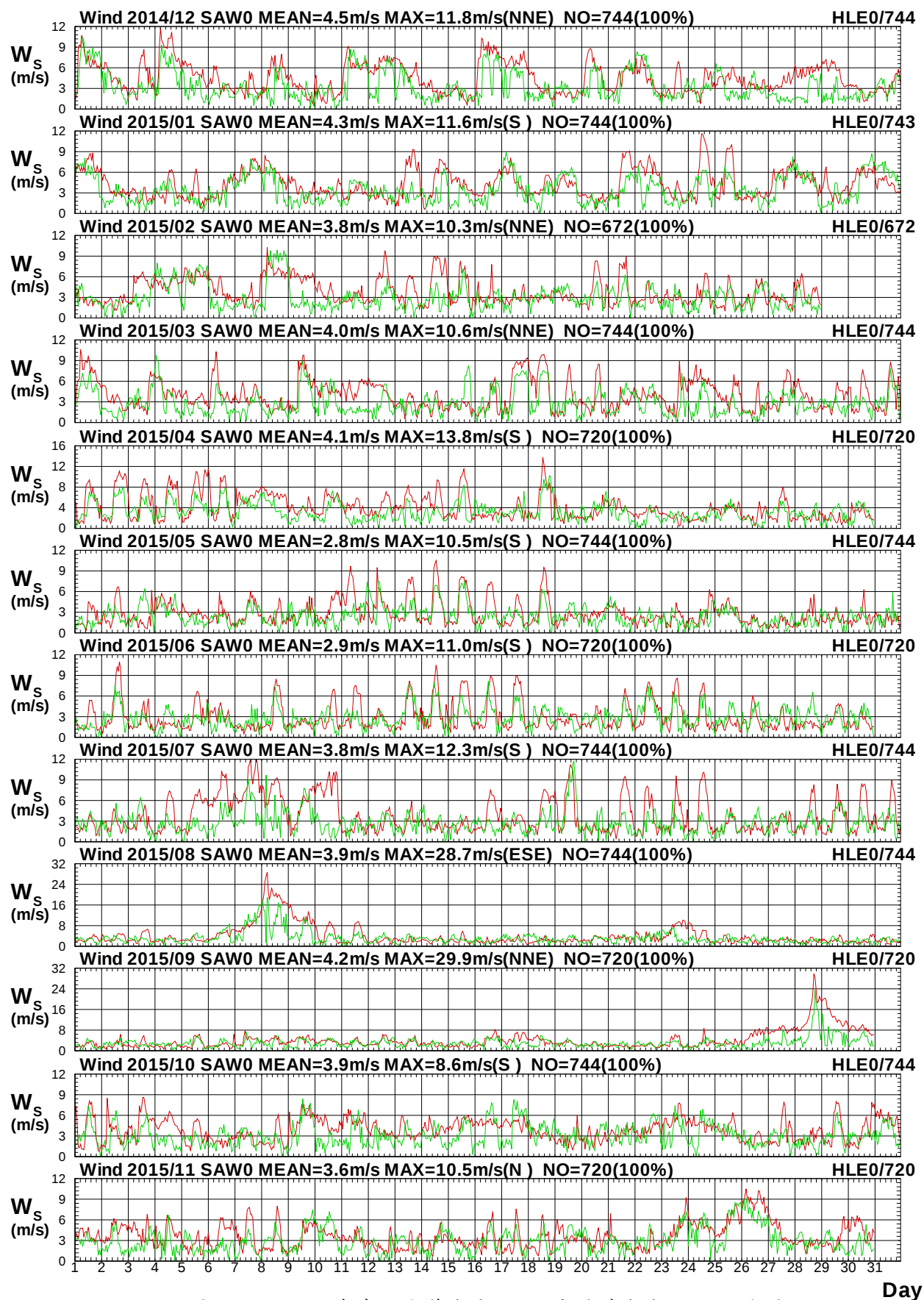


圖 1.17a 2015年每月宜蘭海域 W 站與花蓮海域 E 站風速圖

W14CSAW0.1HA W14CHLE0.1H0 W151SAW0.1HA W151HLE0.1H0 W152SAW0.1HA W152HLE0.1H0

W153SAW0.1HA W153HLE0.1H0 W154SAW0.1HA W154HLE0.1H0 W155SAW0.1HA W155HLE0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

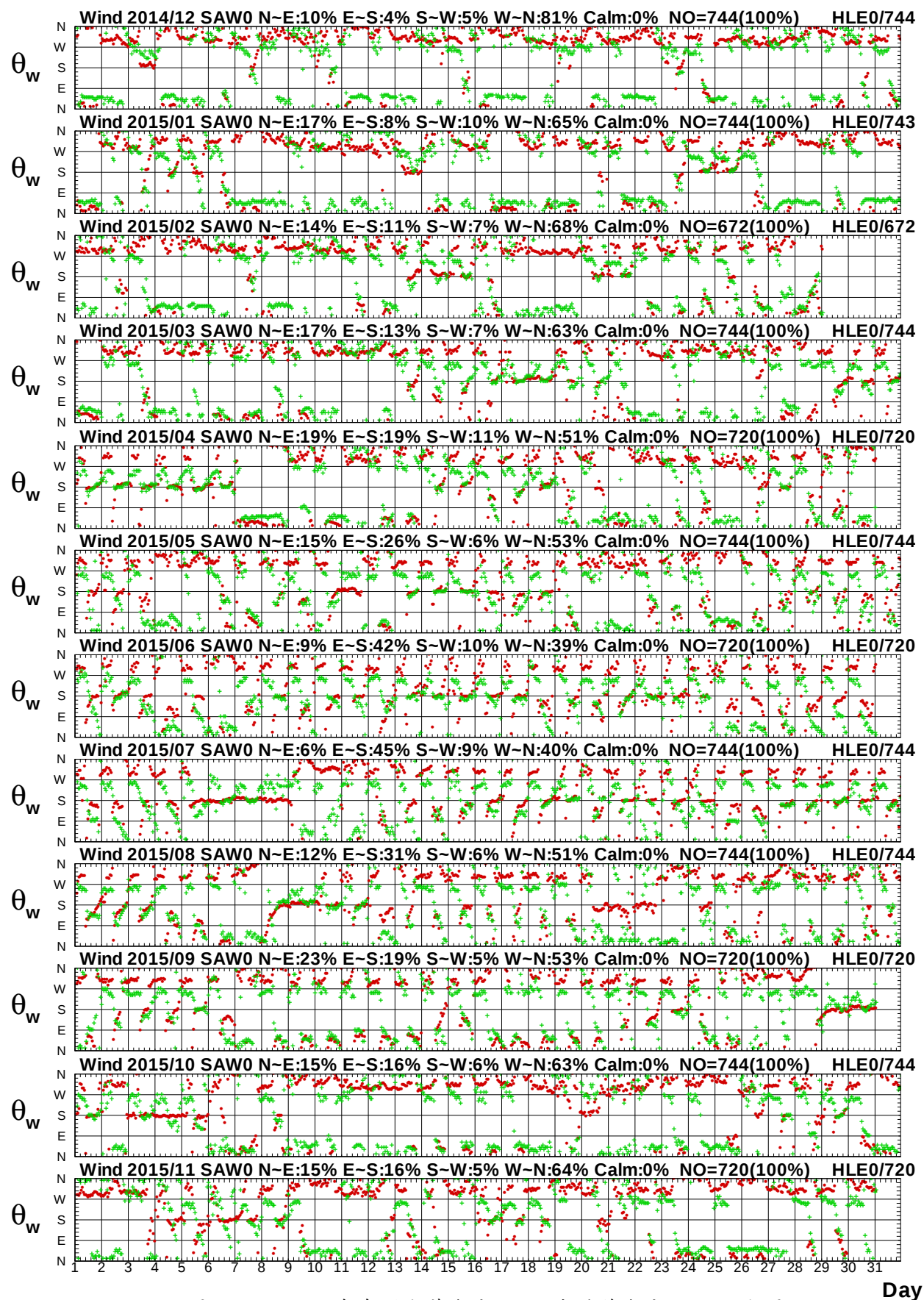


圖 1.17b 2015年每月宜蘭海域 W 站與花蓮海域 E 站風向圖

W14CSAW0.1HA W14CHLE0.1H0 W151SAW0.1HA W151HLE0.1H0 W152SAW0.1HA W152HLE0.1H0

W153SAW0.1HA W153HLE0.1H0 W154SAW0.1HA W154HLE0.1H0 W155SAW0.1HA W155HLE0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

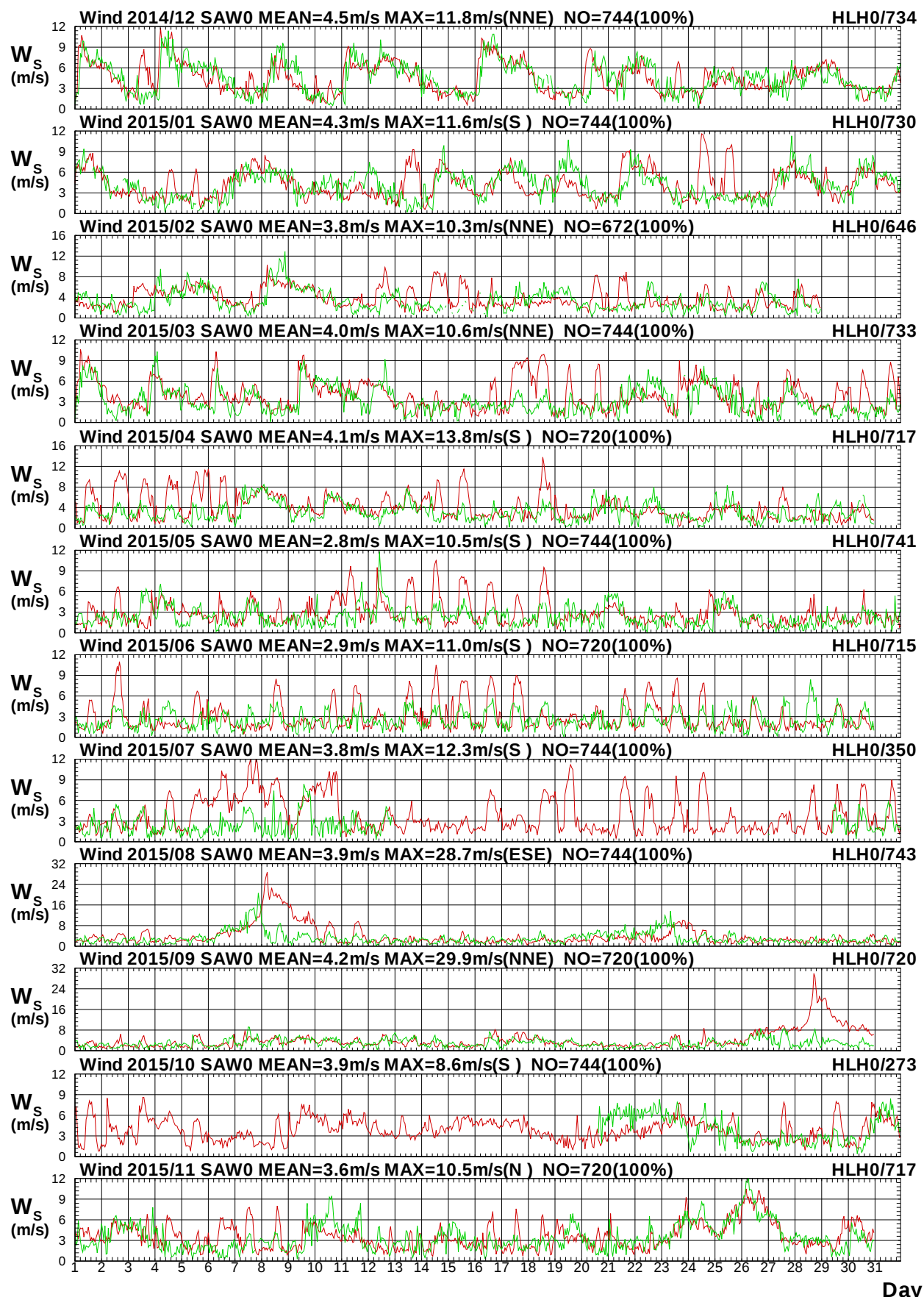


圖 1.18a 2015年每月宜蘭海域 W 站與花蓮海域 H 站風速圖

W14CSAW0.1HA W14CHLH0.1H0 W151SAW0.1HA W151HLH0.1H0 W152SAW0.1HA W152HLH0.1H0

W153SAW0.1HA W153HLH0.1H0 W154SAW0.1HA W154HLH0.1H0 W155SAW0.1HA W155HLH0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

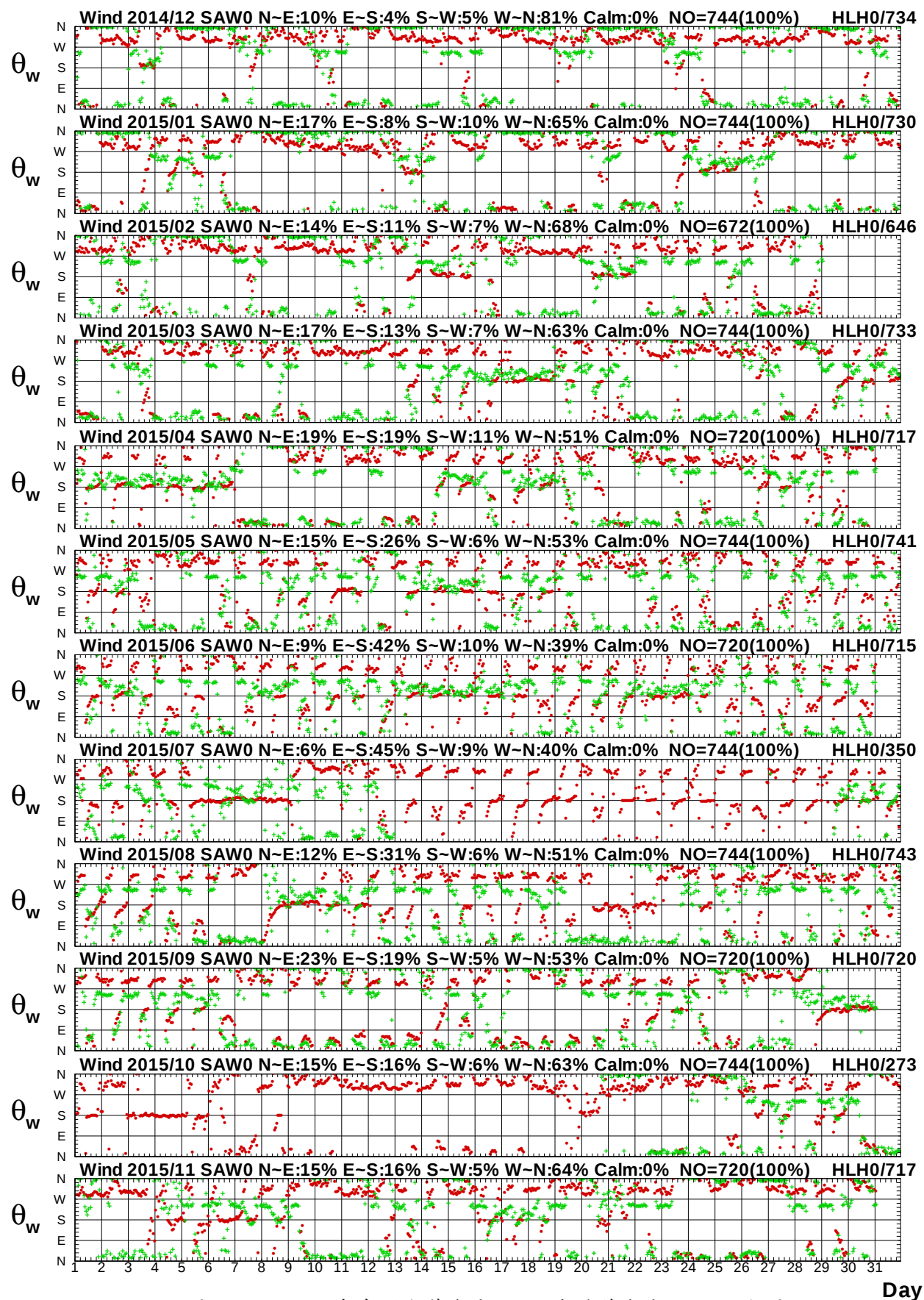


圖 1.18b 2015年每月宜蘭海域 W 站與花蓮海域 H 站風向圖

W14CSAW0.1HA W14CHLH0.1H0 W151SAW0.1HA W151HLH0.1H0 W152SAW0.1HA W152HLH0.1H0

W153SAW0.1HA W153HLH0.1H0 W154SAW0.1HA W154HLH0.1H0 W155SAW0.1HA W155HLH0.1H0

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# Wind Speed in Yi-Lan Seas of SAW0 at 2015

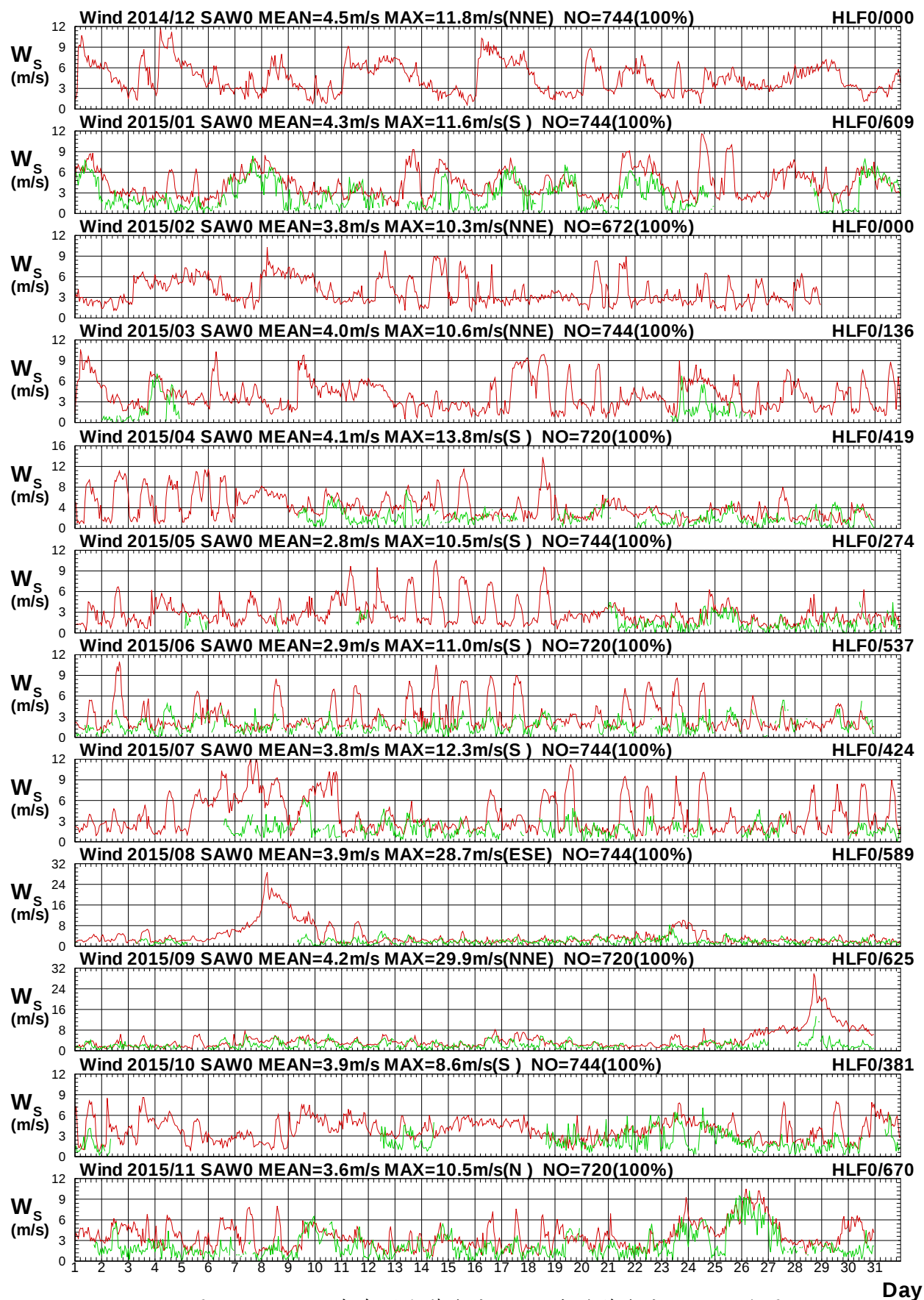


圖 1.19a 2015年每月宜蘭海域 W 站與花蓮海域 F 站風速圖

W14CSAW0.1HA W14CHLF0.1H0 W151SAW0.1HA W151HLF0.1H0 W152SAW0.1HA W152HLF0.1H0  
W153SAW0.1HA W153HLF0.1H0 W154SAW0.1HA W154HLF0.1H0 W155SAW0.1HA W155HLF0.1H0

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# Wind Direction in Yi-Lan Seas of SAW0 at 2015

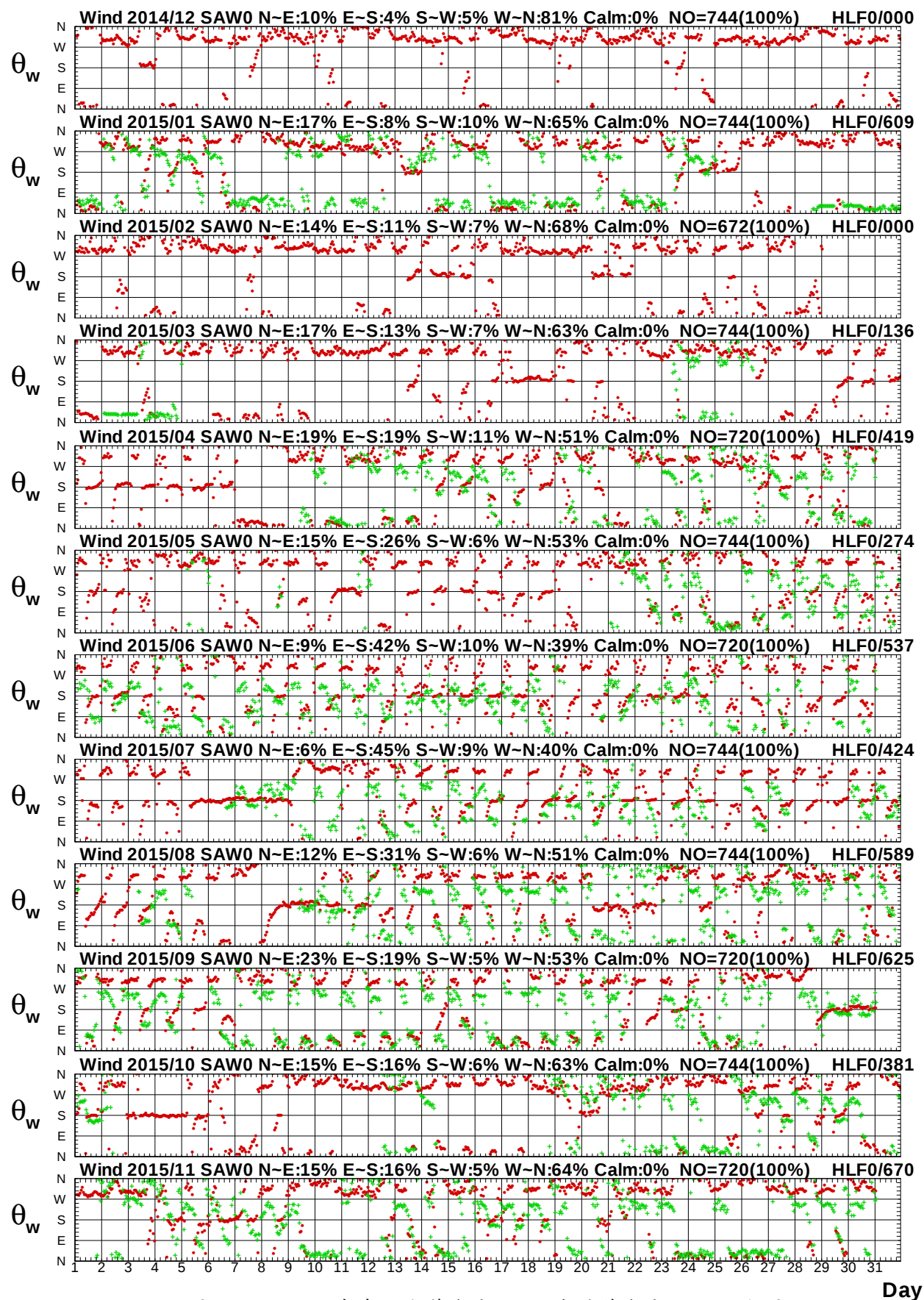


圖 1.19b 2015年每月宜蘭海域 W 站與花蓮海域 F 站風向圖

W14CSAW0.1HA W14CHLF0.1H0 W151SAW0.1HA W151HLF0.1H0 W152SAW0.1HA W152HLF0.1H0  
W153SAW0.1HA W153HLF0.1H0 W154SAW0.1HA W154HLF0.1H0 W155SAW0.1HA W155HLF0.1H0

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## 第二章 2015 年宜蘭海域觀測波浪資料

宜蘭海域波浪之觀測本中心(IHMT)於 2002 年 7 月 19 日於蘇澳港外約 700m 附近(稱**測站 X**)，水深約 25 公尺處設置挪威 NORTEK 公司之剖面海流與表面波浪(波高、週期及波向)即時傳送監測系統(簡稱 AWCP)波浪觀測站，其位置如附圖 2。

**測站 Y**(蘇澳外海浮標站)之波浪儀屬水利署(WRA)所有，**測站 Z**(龜山島外海浮標站)之波浪儀屬觀光局東北角管理處(TBRC)所設置。福隆海上浮標(**測站 R**)觀測風力，係國立成功大學水文中心(COMC)所裝設。蘇澳海域各測站歷年觀測波浪資料蒐集概況如表 2。

波浪觀測 AWCP 系統有兩個分離波高量測模式：一個是對平靜波浪時，當資料由傳統式壓力感應器量測時將會因儀器佈放的深度而受很大的影響。此時，表面高度必須用一個聲波式的高度感應器量測波高。AWCP 波向量測範圍：波向的量測從海面下 3 米以上的流向資料與波高資料計算轉換而得。對攪動的海況來說；用於轉換波向的該層深度應該自動被調整為平均水位也就是  $H_{\max}/2$ 。量測的參數為：平均波向及波向分佈，波向單位為度。

本波浪年報以取經檢核或修補後之 **X 站** 資料作為**主要觀測站**，2015 年主要觀測站修補前(後)每月觀測之波浪資料記錄期間統計表，如表 2.1a，2015 年波浪**次要觀測站**資料(未補餘)記錄統計表，如表 2.1b，**主要觀測站修補前後**每月波浪歷線比較圖，如圖 2.1，**主要觀測站與次要觀測站(或其他觀測站)**每月波浪歷線比較圖，如圖 2.2 以後。

表 2 宜蘭海域觀測波浪資料蒐集概況表(統計時間至 2015 年 11 月)

| 測站 | 緯度         | 經度          | 觀測期間                 | 觀測單位 | 備註       |
|----|------------|-------------|----------------------|------|----------|
| X  | 24°35'23"N | 121°53'07"E | 2002/08-2015/11(觀測中) | 港研中心 | AWCP 蘇澳港 |
| Y  | 24°37'38"N | 121°52'36"E | 1999/09-2015/11(觀測中) | 水利署  | 蘇澳浮標站    |
| Z  | 24°50'52"N | 121°55'39"E | 2002/05-2015/11(觀測中) | 觀光局  | 龜山島浮標站   |
| R  | 22°18'50"N | 120°21'50"E | 2006/04-2008/08      | 水文中心 | 福隆浮標站    |

# 宜蘭海域



IHMT 波潮流站



WRA 浮標波浪站



COMC 福隆浮標波浪站



TBRC 龜山島浮標波浪站



圖 2 宜蘭海域波浪觀測站位置示意圖

表 2.1a 2015 年每月宜蘭海域修補前各測站觀測波浪資料紀錄統計表

| 年/月 港區    | 宜蘭海域         | 宜蘭海域         | 宜蘭海域         | 宜蘭海域 | 宜蘭海域 | 宜蘭海域 | 宜蘭海域 | 宜蘭海域 |
|-----------|--------------|--------------|--------------|------|------|------|------|------|
| 測站        | X            | Y            | Z            | R    |      |      |      |      |
| 2014/12 月 | 729 (98.0%)  | 733 (98.5%)  | 738 (99.2%)  | *    | *    | *    | *    | *    |
| 2015/ 1 月 | 744 (100%)   | 731 (98.3%)  | 731 (98.3%)  | *    | *    | *    | *    | *    |
| 2015/ 2 月 | 672 (100%)   | 431 (64.1%)  | 668 (99.4%)  | *    | *    | *    | *    | *    |
| 2015/ 3 月 | 736 (98.9%)  | 637 (85.6%)  | 735 (98.8%)  | *    | *    | *    | *    | *    |
| 2015/ 4 月 | 717 (99.6%)  | 694 (96.4%)  | 709 (98.5%)  | *    | *    | *    | *    | *    |
| 2015/ 5 月 | 744 (100%)   | 730 (98.1%)  | 728 (97.8%)  | *    | *    | *    | *    | *    |
| 2015/ 6 月 | 716 (99.4%)  | 711 (98.8%)  | 716 (99.4%)  | *    | *    | *    | *    | *    |
| 2015/ 7 月 | 743 (99.9%)  | 733 (98.5%)  | 737 (99.1%)  | *    | *    | *    | *    | *    |
| 2015/ 8 月 | 744 (100%)   | 166 (22.3%)  | 739 (99.3%)  | *    | *    | *    | *    | *    |
| 2015/ 9 月 | 720 (100%)   | *            | 679 (94.3%)  | *    | *    | *    | *    | *    |
| 2015/10 月 | 662 (89.0%)  | 393 (52.8%)  | 698 (93.8%)  | *    | *    | *    | *    | *    |
| 2015/11 月 | *            | 720 (100%)   | 709 (98.5%)  | *    | *    | *    | *    | *    |
| 2015/冬季   | 2145 (99.3%) | 1895 (87.7%) | 2137 (98.9%) | *    | *    | *    | *    | *    |
| 2015/春季   | 2197 (99.5%) | 2061 (93.3%) | 2172 (98.4%) | *    | *    | *    | *    | *    |
| 2015/夏季   | 2203 (99.8%) | 1610 (72.9%) | 2192 (99.3%) | *    | *    | *    | *    | *    |
| 2015/秋季   | 1382 (63.3%) | 1113 (51.0%) | 2086 (95.5%) | *    | *    | *    | *    | *    |
| 2015/整年   | 7927 (90.5%) | 6679 (76.2%) | 8587 (98.0%) | *    | *    | *    | *    | *    |
| 起始年月      | 2014/12      | 2014/12      | 2014/12      | *    | *    | *    | *    | *    |
| 結束年月      | 2015/10      | 2015/11      | 2015/11      | *    | *    | *    | *    | *    |

表2.1b 2015年每月宜蘭海域修補後各測站波浪資料統計表

| 年/月 港區    | 宜蘭海域    |        | 宜蘭海域    |        | 宜蘭海域    |        | 宜蘭海域 |   | 宜蘭海域 |   |
|-----------|---------|--------|---------|--------|---------|--------|------|---|------|---|
| 測站        | X       |        | Y       |        | Z       |        | R    |   |      |   |
| 2014/12 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 1 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 2 月 | 672     | (100%) | 672     | (100%) | 672     | (100%) | *    | * | *    | * |
| 2015/ 3 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 4 月 | 720     | (100%) | 720     | (100%) | 720     | (100%) | *    | * | *    | * |
| 2015/ 5 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 6 月 | 720     | (100%) | 720     | (100%) | 720     | (100%) | *    | * | *    | * |
| 2015/ 7 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 8 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/ 9 月 | 720     | (100%) | 720     | (100%) | 720     | (100%) | *    | * | *    | * |
| 2015/10 月 | 744     | (100%) | 744     | (100%) | 744     | (100%) | *    | * | *    | * |
| 2015/11 月 | 720     | (100%) | 720     | (100%) | 720     | (100%) | *    | * | *    | * |
| 2015/冬季   | 2160    | (100%) | 2160    | (100%) | 2160    | (100%) | *    | * | *    | * |
| 2015/春季   | 2208    | (100%) | 2208    | (100%) | 2208    | (100%) | *    | * | *    | * |
| 2015/夏季   | 2208    | (100%) | 2208    | (100%) | 2208    | (100%) | *    | * | *    | * |
| 2015/秋季   | 2184    | (100%) | 2184    | (100%) | 2184    | (100%) | *    | * | *    | * |
| 2015/整年   | 8760    | (100%) | 8760    | (100%) | 8760    | (100%) | *    | * | *    | * |
| 起始年月      | 2014/12 |        | 2014/12 |        | 2014/12 |        | *    | * | *    | * |
| 結束年月      | 2015/11 |        | 2015/11 |        | 2015/11 |        | *    | * | *    | * |

# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

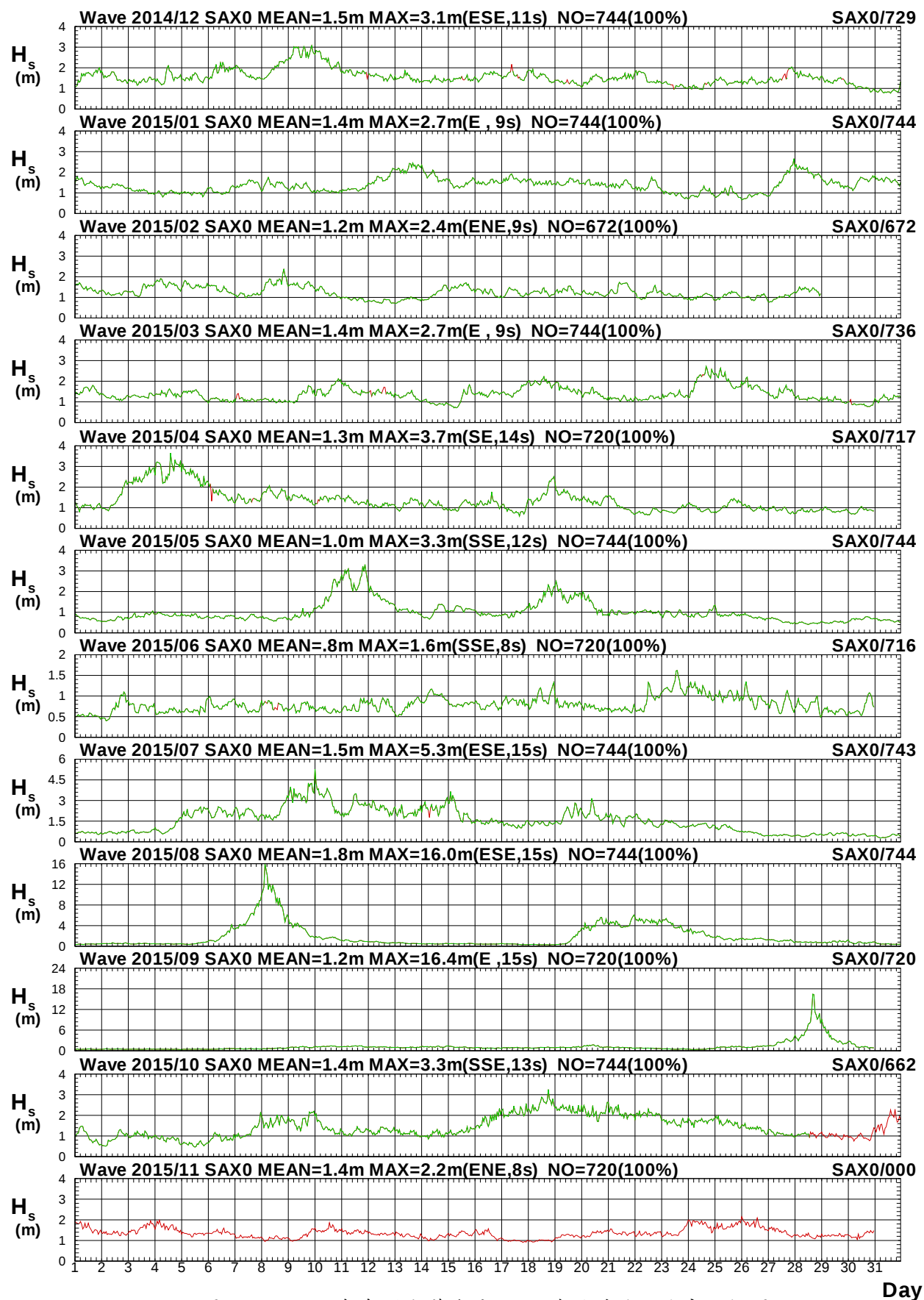


圖 2.1a 2015年每月宜蘭海域 X 站修補前後之波高比較圖

V14CSAX0.1HA V14CSAX0.1H0 V151SAX0.1HA V151SAX0.1H0 V152SAX0.1HA V152SAX0.1H0  
V153SAX0.1HA V153SAX0.1H0 V154SAX0.1HA V154SAX0.1H0 V155SAX0.1HA V155SAX0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

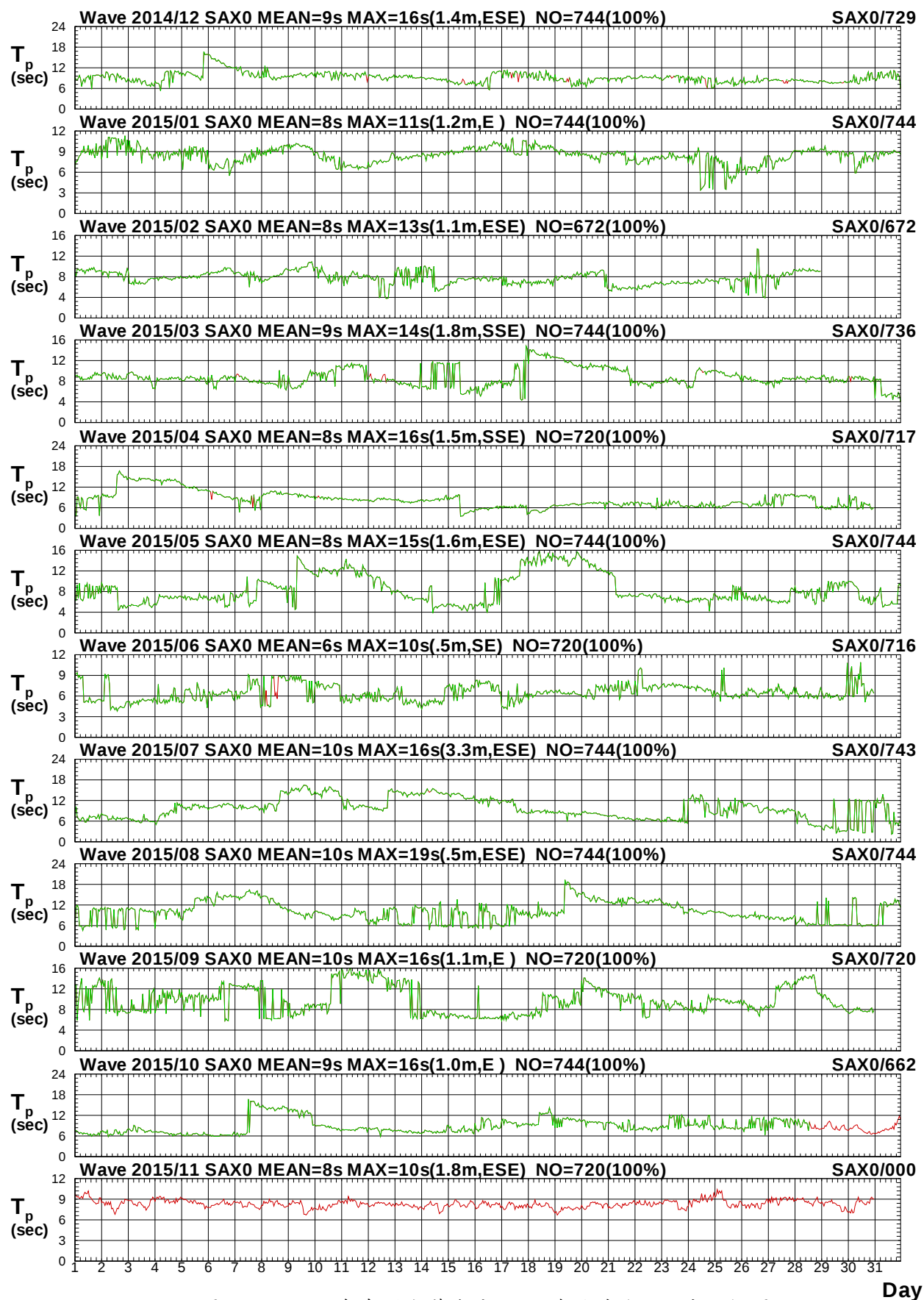


圖 2.1b 2015年每月宜蘭海域 X 站修補前後之週期比較圖

V14CSAX0.1HA V14CSAX0.1H0 V151SAX0.1HA V151SAX0.1H0 V152SAX0.1HA V152SAX0.1H0  
V153SAX0.1HA V153SAX0.1H0 V154SAX0.1HA V154SAX0.1H0 V155SAX0.1HA V155SAX0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

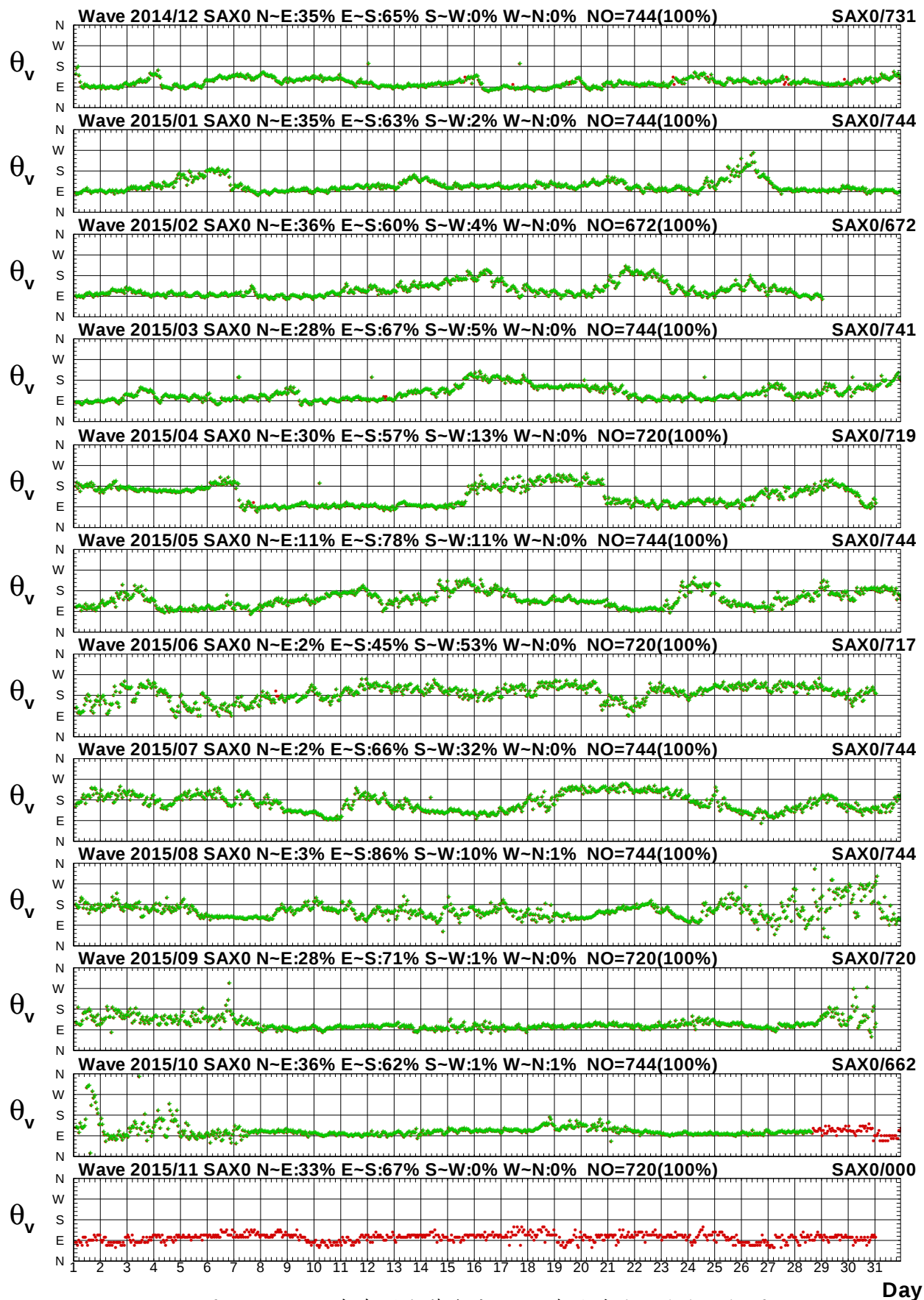


圖 2.1c 2015 年每月宜蘭海域 X 站修補前後之波向比較圖

V14CSAX0.1HA V14CSAX0.1H0 V151SAX0.1HA V151SAX0.1H0 V152SAX0.1HA V152SAX0.1H0  
V153SAX0.1HA V153SAX0.1H0 V154SAX0.1HA V154SAX0.1H0 V155SAX0.1HA V155SAX0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

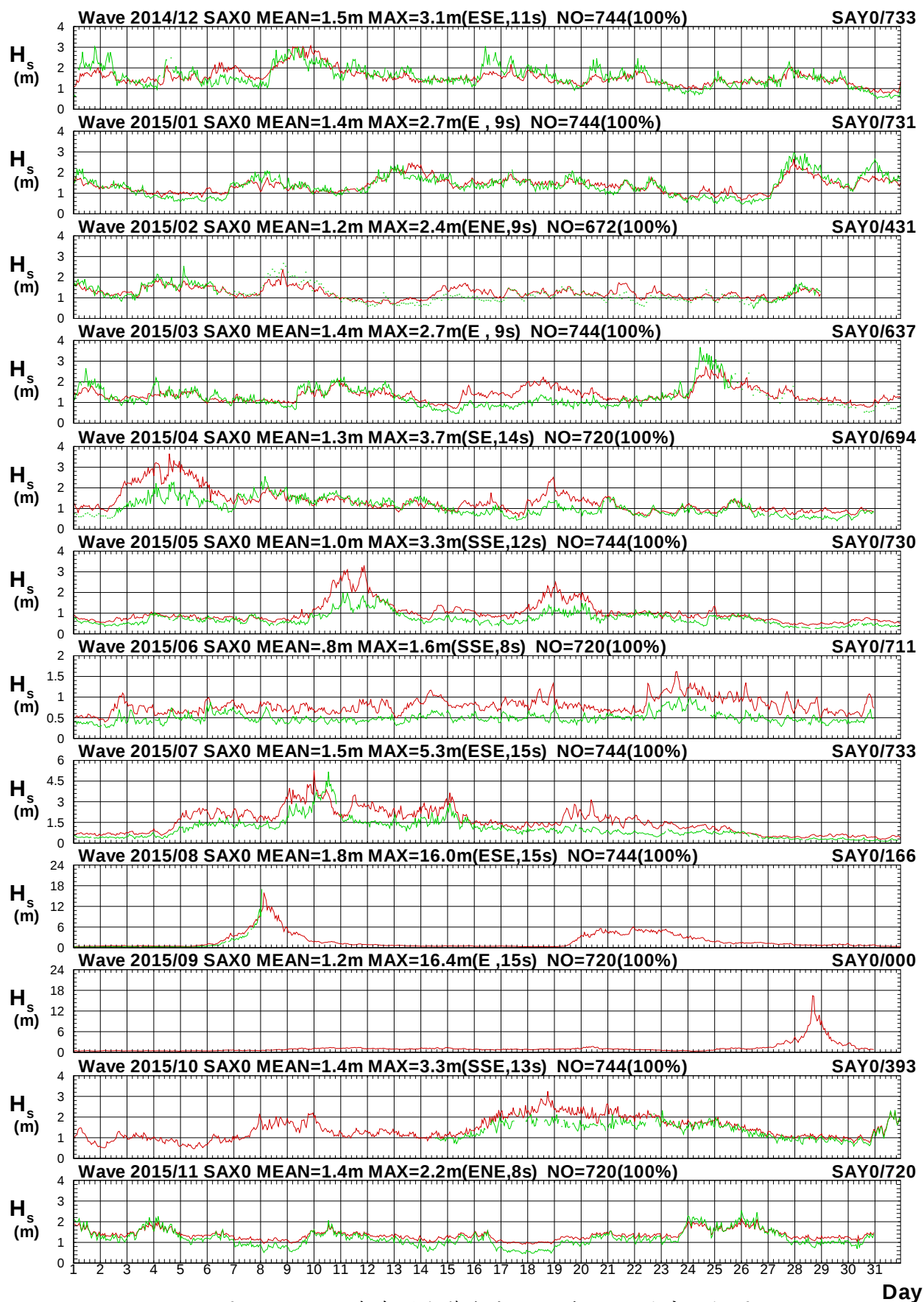


圖 2.2a 2015年每月宜蘭海域 X 站與 Y 站波高比較圖

V14CSAX0.1HA V14CSAY0.1H0 V151SAX0.1HA V151SAY0.1H0 V152SAX0.1HA V152SAY0.1H0  
V153SAX0.1HA V153SAY0.1H0 V154SAX0.1HA V154SAY0.1H0 V155SAX0.1HA V155SAY0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

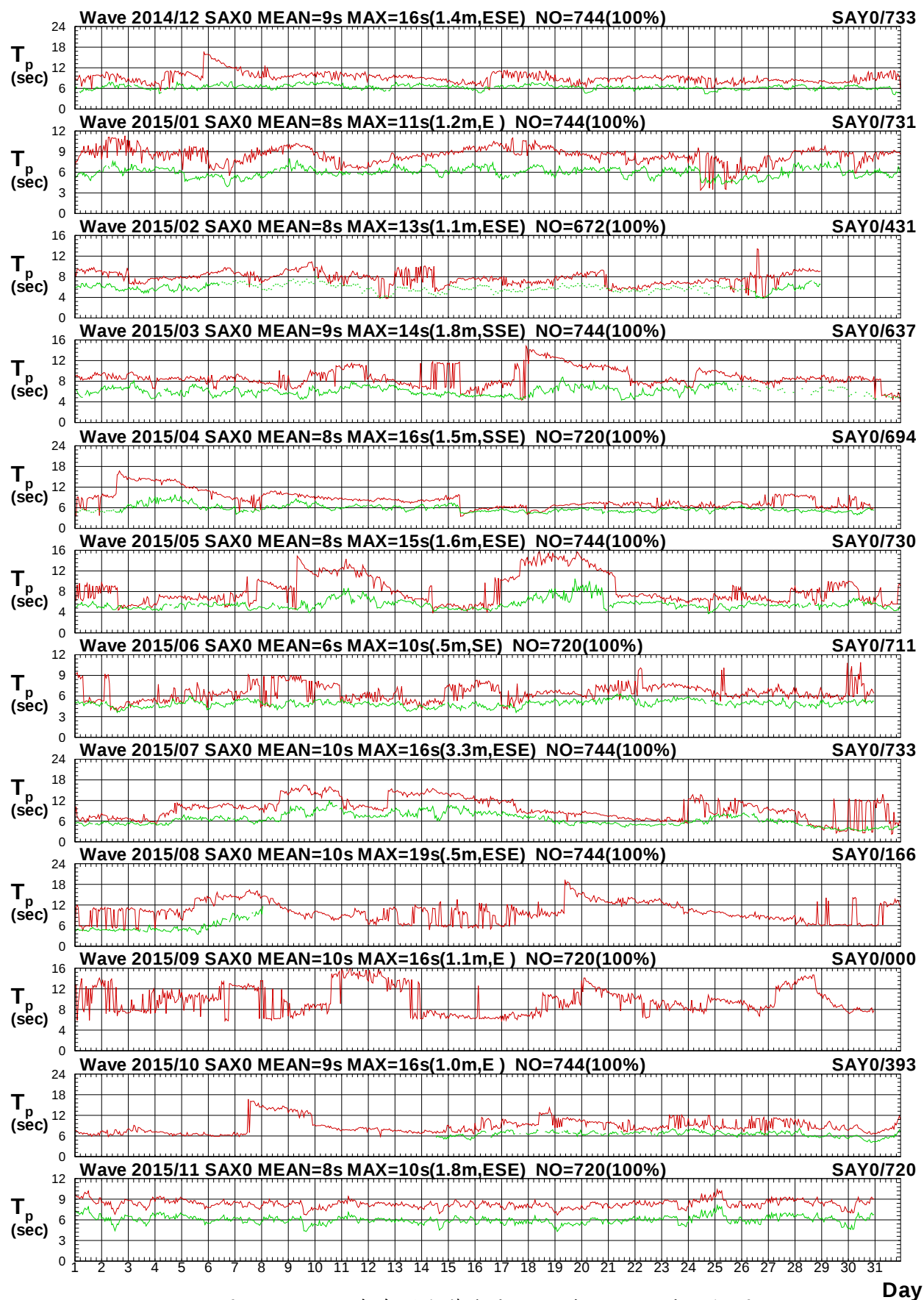


圖 2.2b 2015年每月宜蘭海域 X 站與 Y 站週期比較圖

V14CSAX0.1HA V14CSAY0.1H0 V151SAX0.1HA V151SAY0.1H0 V152SAX0.1HA V152SAY0.1H0  
V153SAX0.1HA V153SAY0.1H0 V154SAX0.1HA V154SAY0.1H0 V155SAX0.1HA V155SAY0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

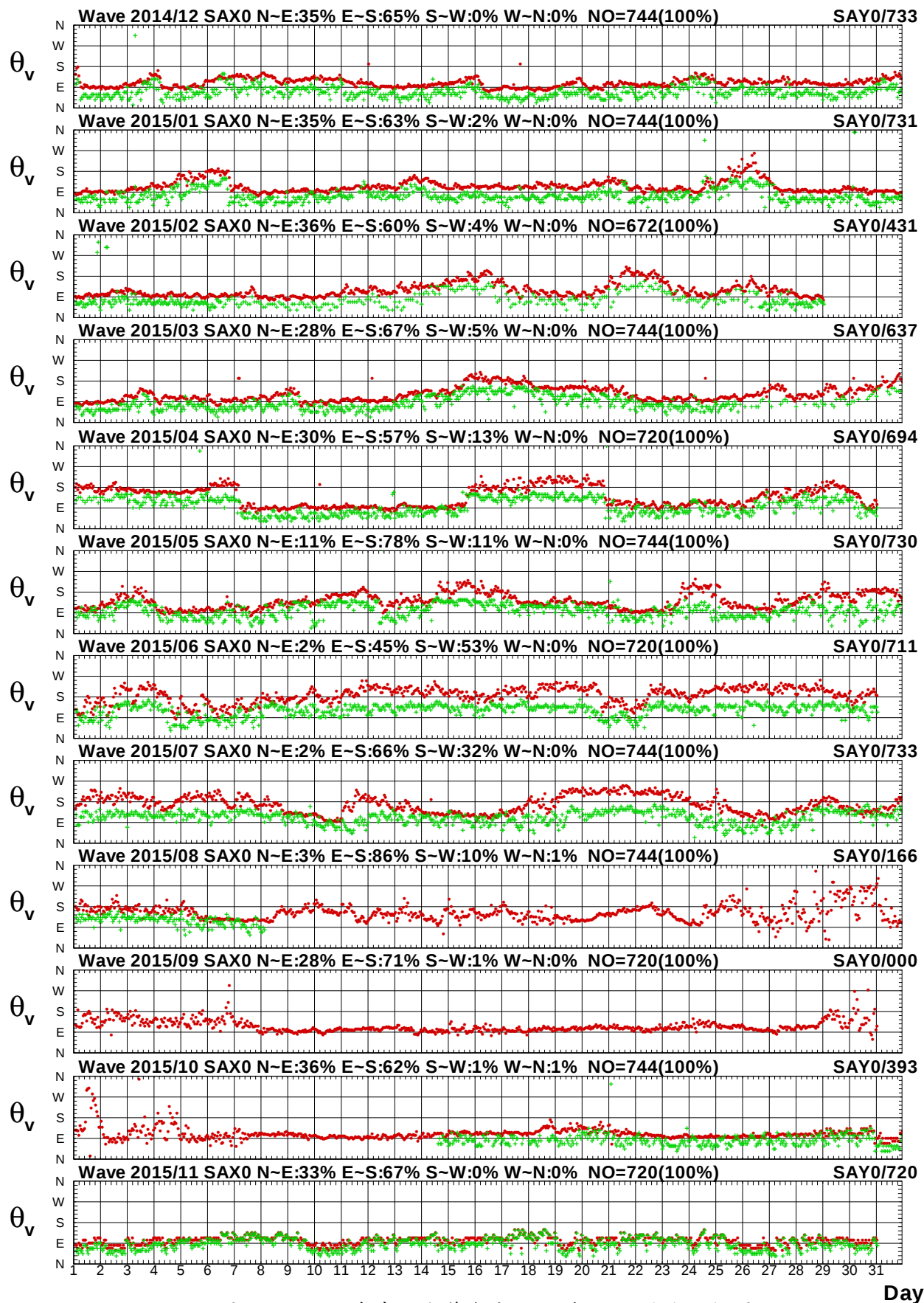


圖 2.2c 2015年每月宜蘭海域 X 站與 Y 站波向比較圖

V14CSAX0.1HA V14CSAY0.1H0 V151SAX0.1HA V151SAY0.1H0 V152SAX0.1HA V152SAY0.1H0  
V153SAX0.1HA V153SAY0.1H0 V154SAX0.1HA V154SAY0.1H0 V155SAX0.1HA V155SAY0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

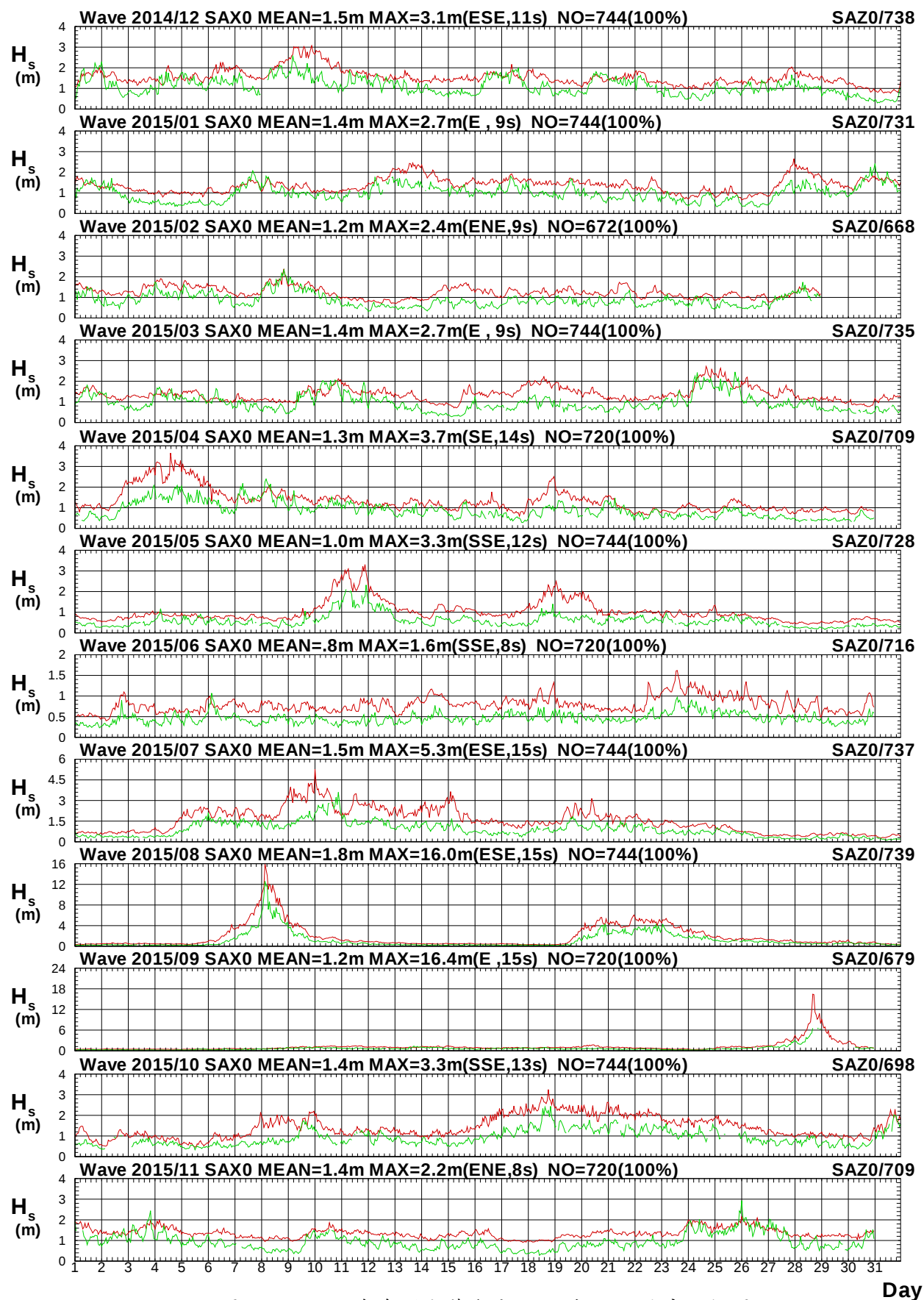


圖 2.3a 2015年每月宜蘭海域 X 站與 Z 站波高比較圖

V14CSAX0.1HA V14CSAZ0.1H0 V151SAX0.1HA V151SAZ0.1H0 V152SAX0.1HA V152SAZ0.1H0  
V153SAX0.1HA V153SAZ0.1H0 V154SAX0.1HA V154SAZ0.1H0 V155SAX0.1HA V155SAZ0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

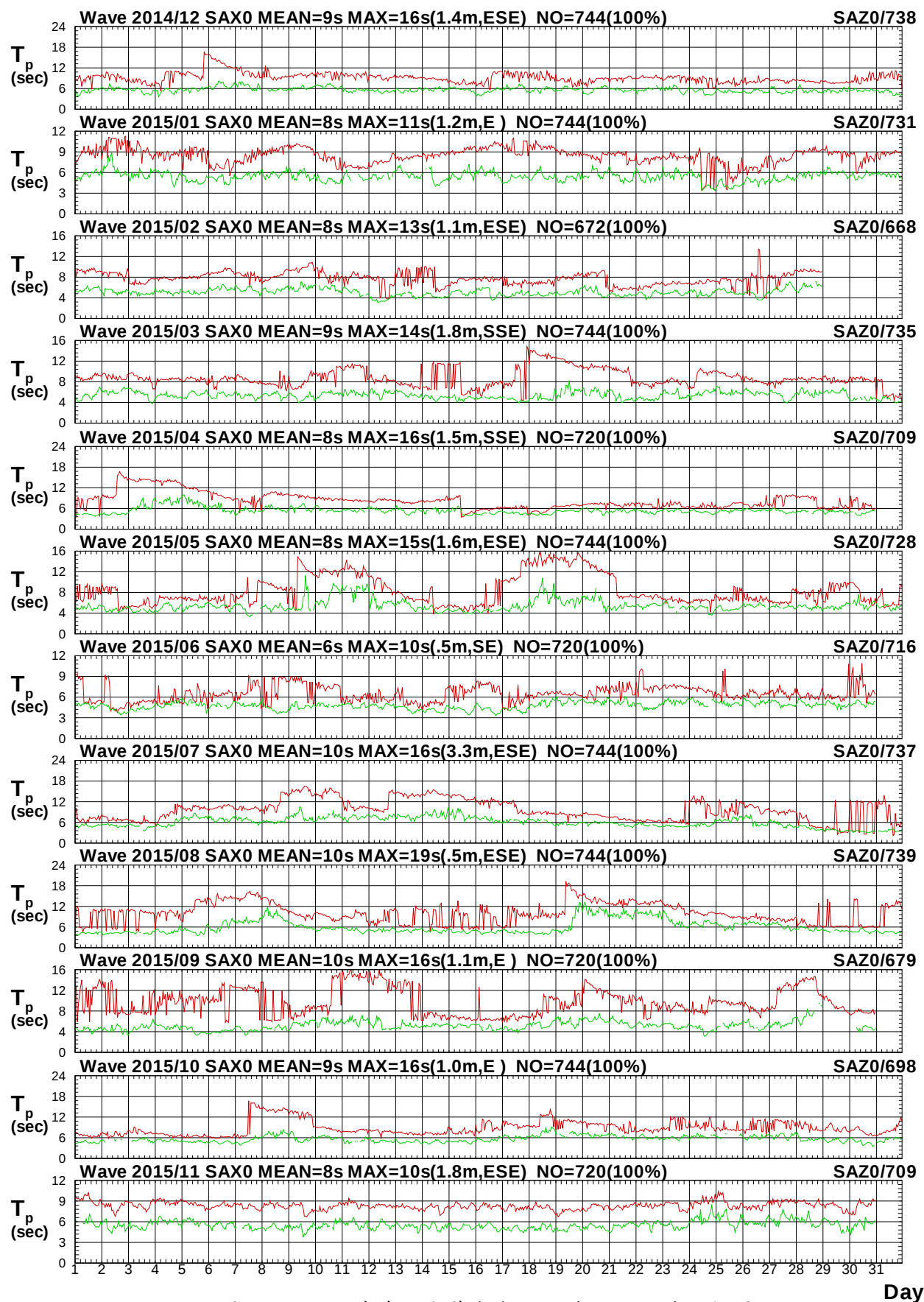


圖 2.3b 2015年每月宜蘭海域 X 站與 Z 站週期比較圖

V14CSAX0.1HA V14CSAZ0.1H0 V151SAX0.1HA V151SAZ0.1H0 V152SAX0.1HA V152SAZ0.1H0  
V153SAX0.1HA V153SAZ0.1H0 V154SAX0.1HA V154SAZ0.1H0 V155SAX0.1HA V155SAZ0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

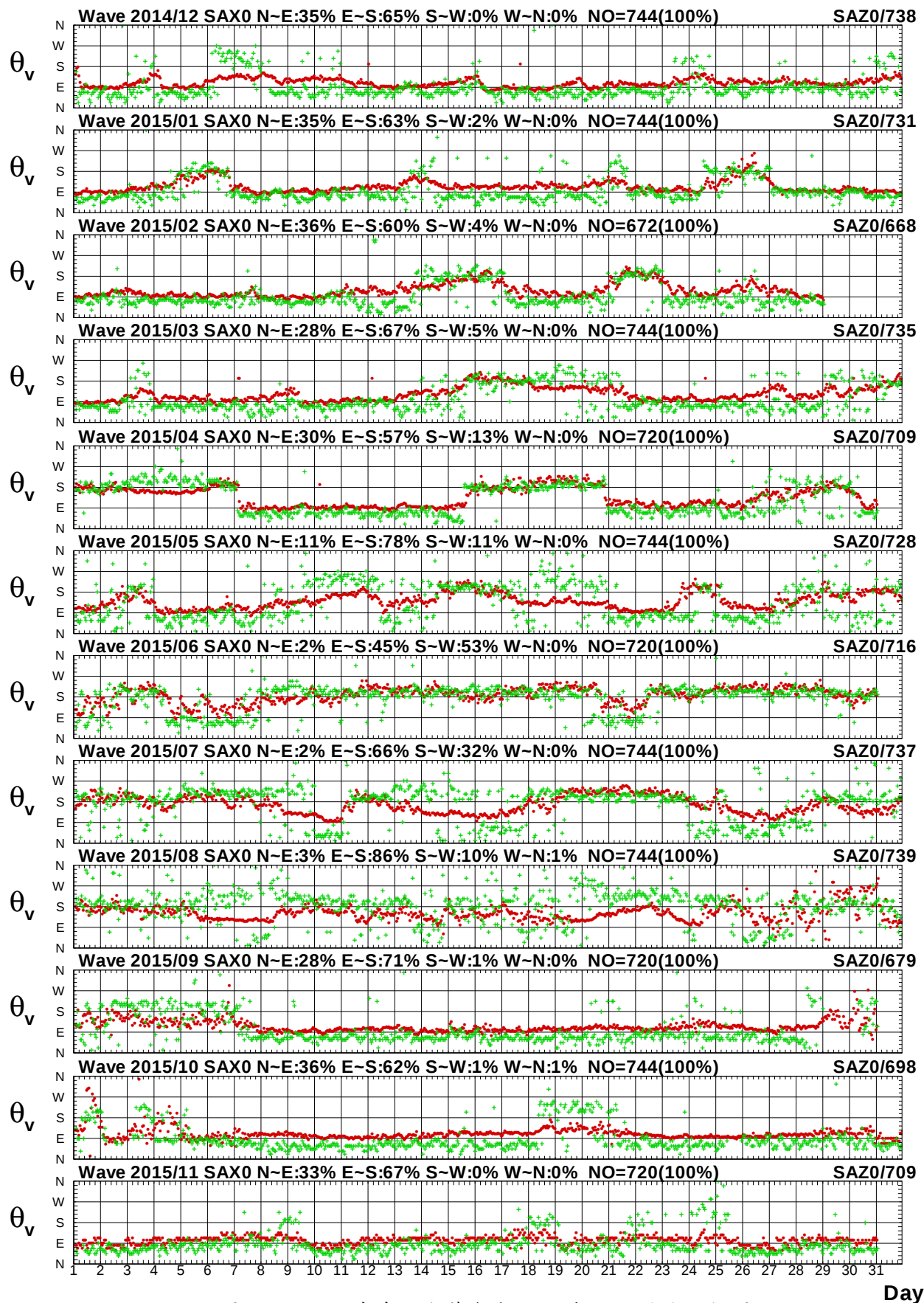


圖 2.3c 2015年每月宜蘭海域 X 站與 Z 站波向比較圖

V14CSAX0.1HA V14CSAZ0.1H0 V151SAX0.1HA V151SAZ0.1H0 V152SAX0.1HA V152SAZ0.1H0  
V153SAX0.1HA V153SAZ0.1H0 V154SAX0.1HA V154SAZ0.1H0 V155SAX0.1HA V155SAZ0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

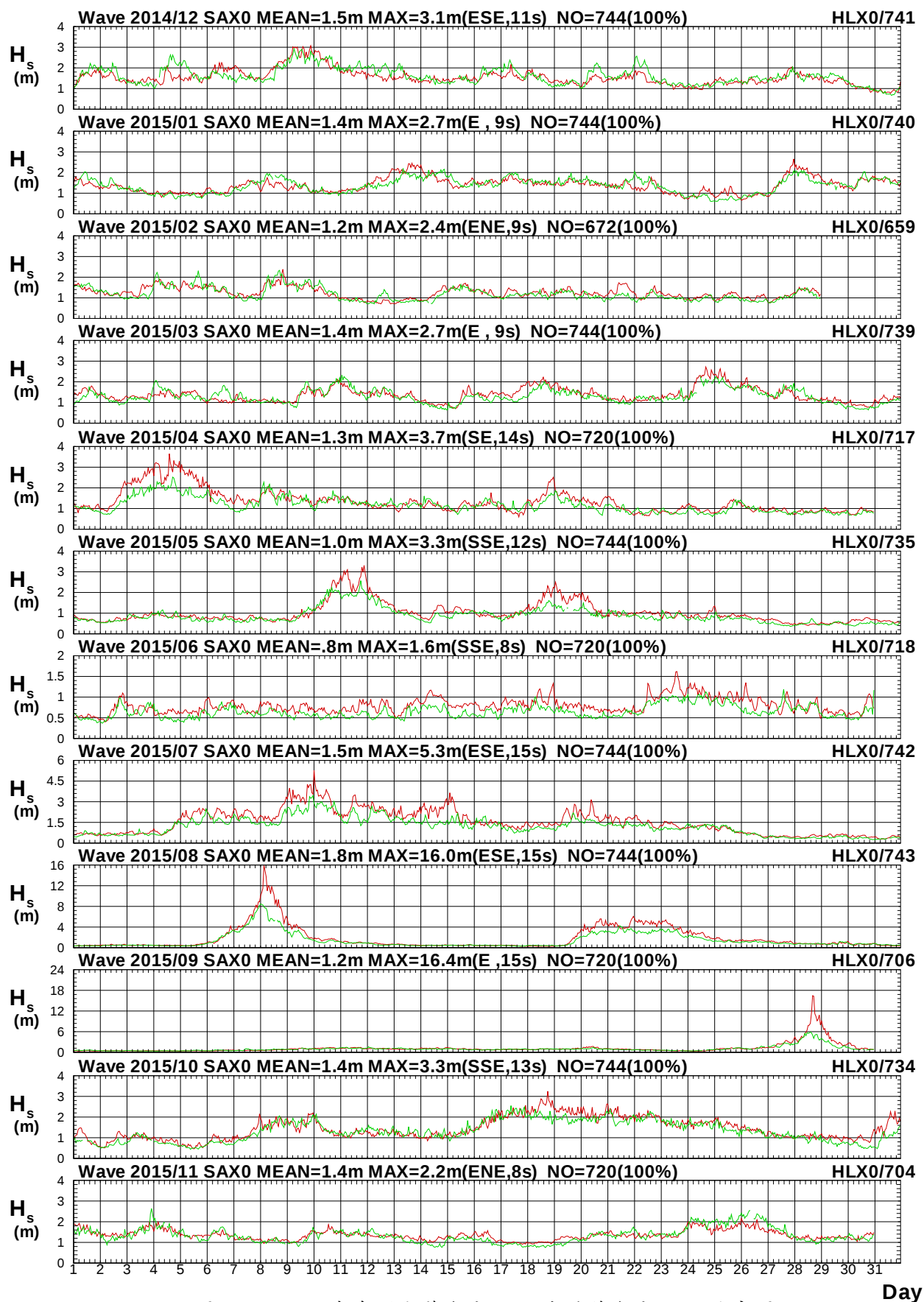


圖 2.4a 2015年每月宜蘭海域 X 站與花蓮海域 X 站波高圖

V14CSAX0.1HA V14CHLX0.1H0 V151SAX0.1HA V151HLX0.1H0 V152SAX0.1HA V152HLX0.1H0  
V153SAX0.1HA V153HLX0.1H0 V154SAX0.1HA V154HLX0.1H0 V155SAX0.1HA V155HLX0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

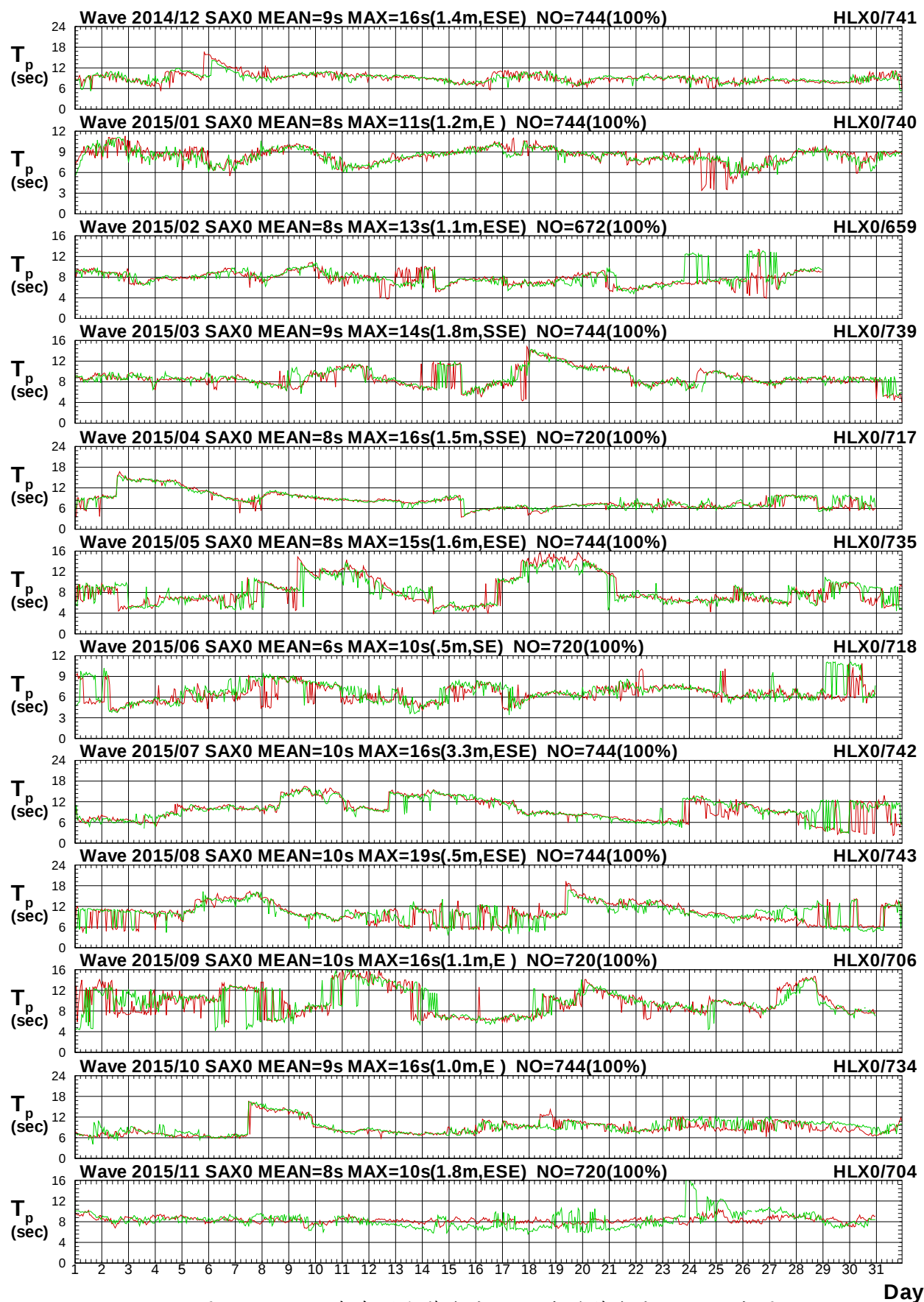


圖 2.4b 2015年每月宜蘭海域 X 站與花蓮海域 X 站週期圖

V14CSAX0.1HA V14CHLX0.1H0 V151SAX0.1HA V151HLX0.1H0 V152SAX0.1HA V152HLX0.1H0  
V153SAX0.1HA V153HLX0.1H0 V154SAX0.1HA V154HLX0.1H0 V155SAX0.1HA V155HLX0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

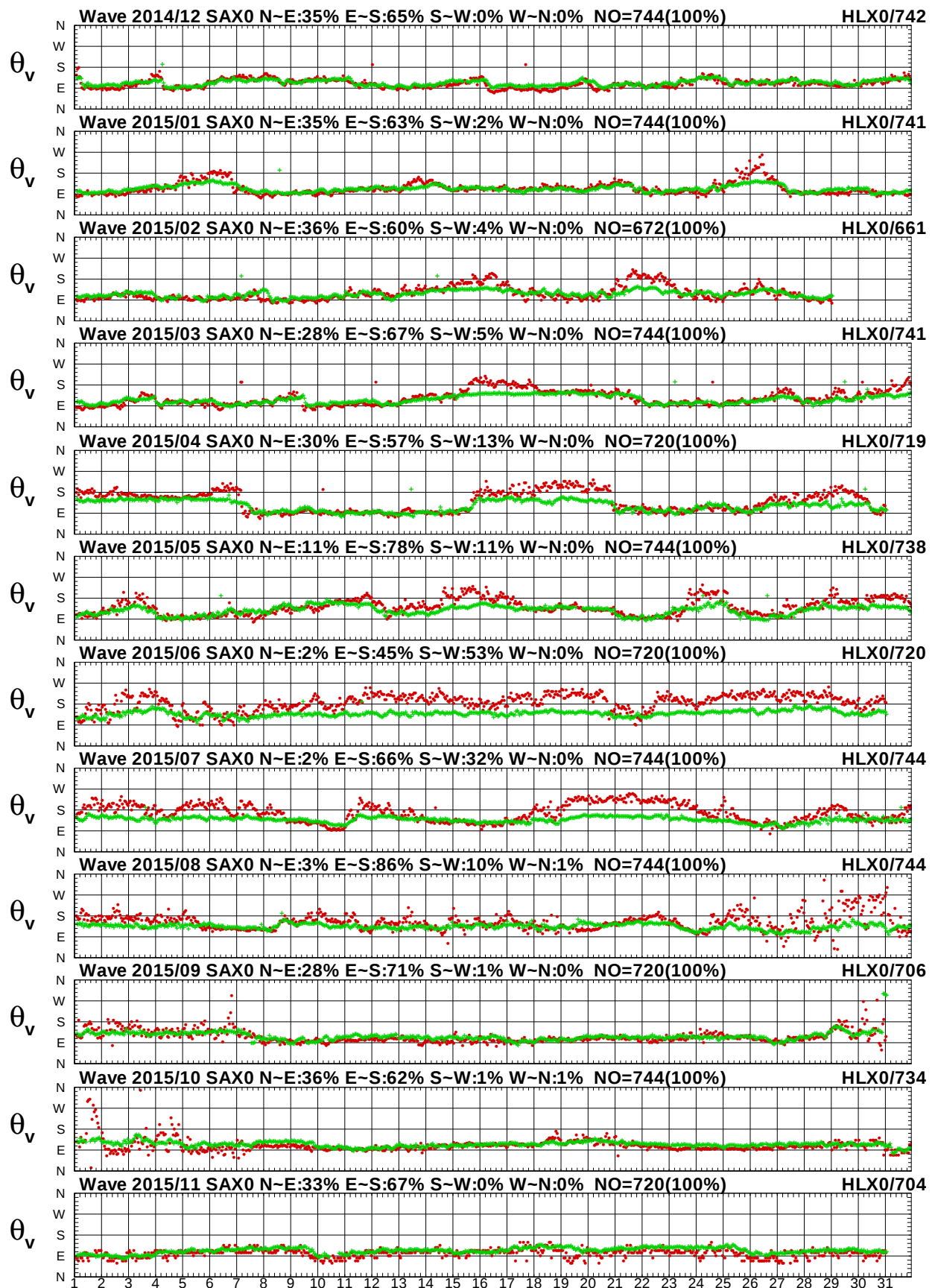


圖 2.4c 2015年每月宜蘭海域 X 站與花蓮海域 X 站波向圖

V14CSAX0.1HA V14CHLX0.1H0 V151SAX0.1HA V151HLX0.1H0 V152SAX0.1HA V152HLX0.1H0  
V153SAX0.1HA V153HLX0.1H0 V154SAX0.1HA V154HLX0.1H0 V155SAX0.1HA V155HLX0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

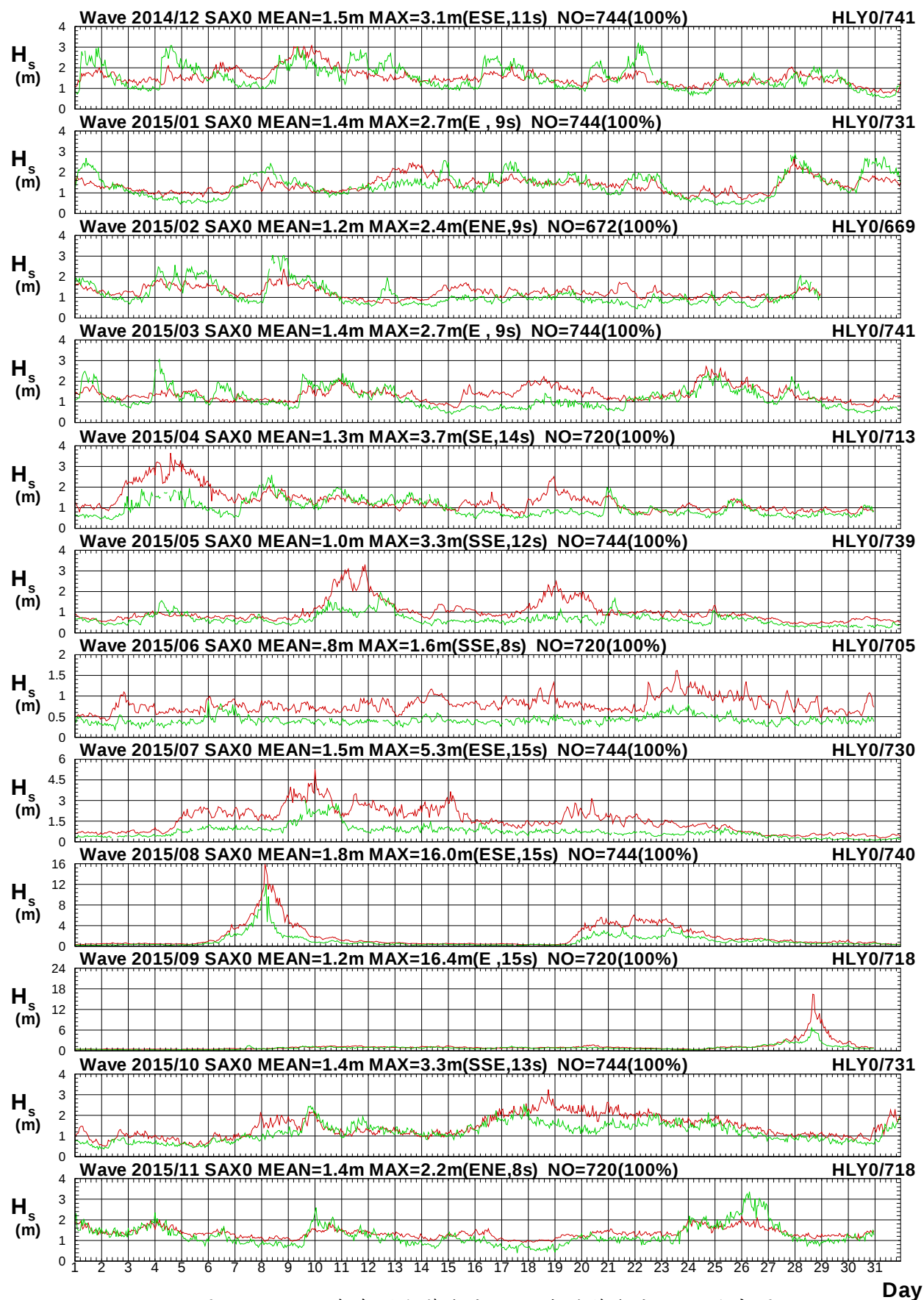


圖 2.5a 2015年每月宜蘭海域 X 站與花蓮海域 Y 站波高圖

V14CSAX0.1HA V14CHLY0.1H0 V151SAX0.1HA V151HLY0.1H0 V152SAX0.1HA V152HLY0.1H0  
V153SAX0.1HA V153HLY0.1H0 V154SAX0.1HA V154HLY0.1H0 V155SAX0.1HA V155HLY0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

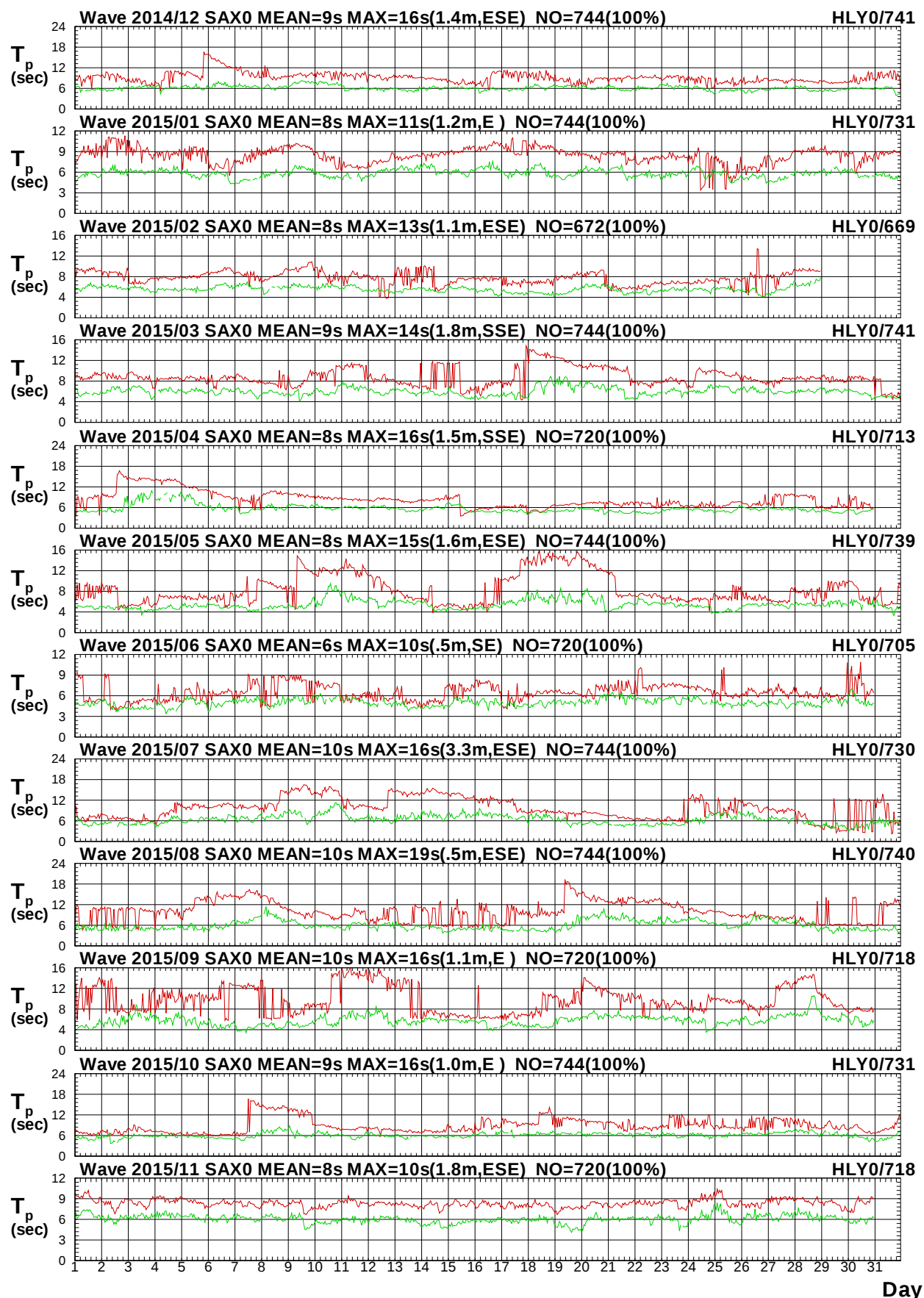


圖 2.5b 2015年每月宜蘭海域 X 站與花蓮海域 Y 站週期圖

V14CSAX0.1HA V14CHLY0.1H0 V151SAX0.1HA V151HLY0.1H0 V152SAX0.1HA V152HLY0.1H0  
V153SAX0.1HA V153HLY0.1H0 V154SAX0.1HA V154HLY0.1H0 V155SAX0.1HA V155HLY0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

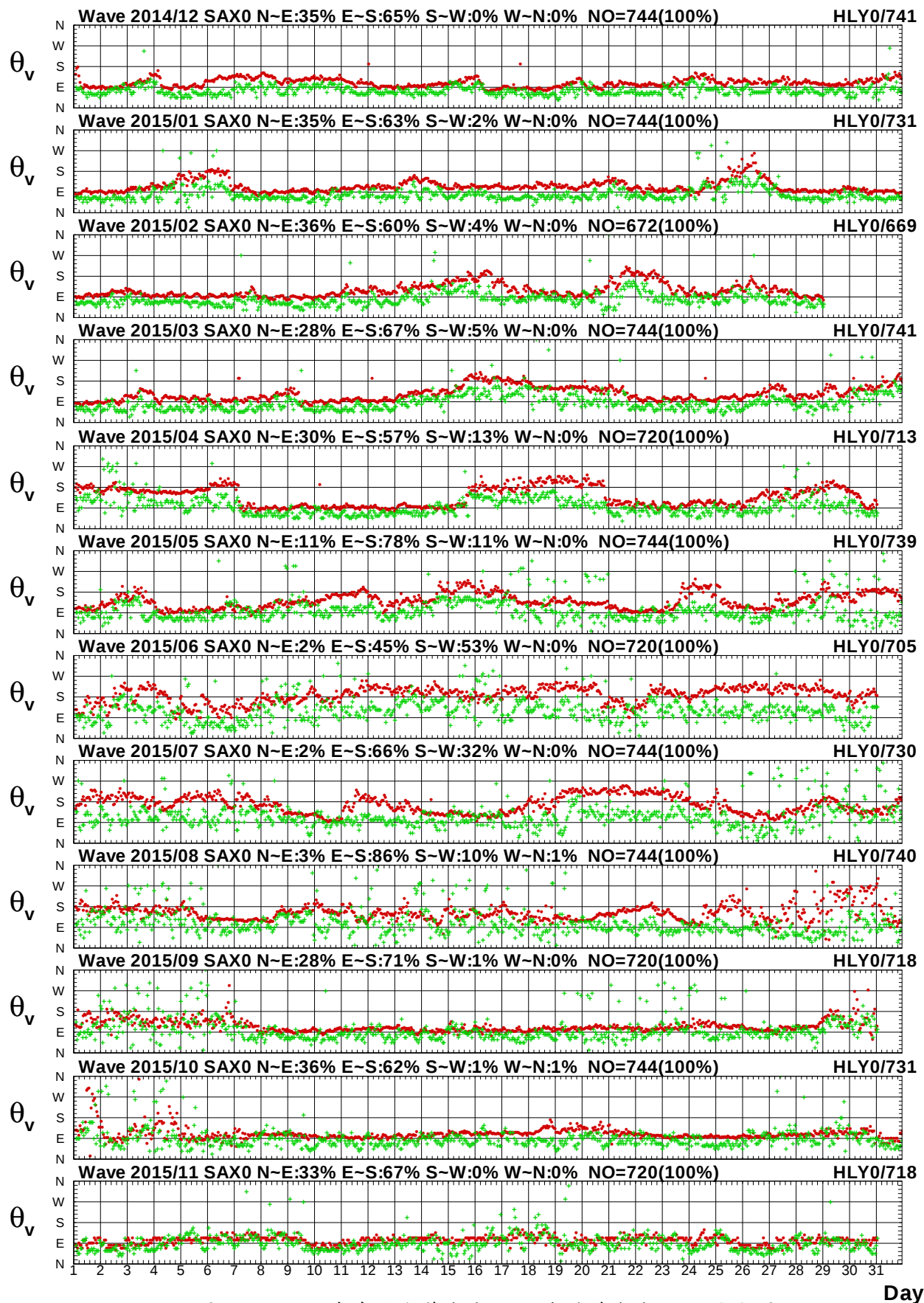


圖 2.5c 2015年每月宜蘭海域 X 站與花蓮海域 Y 站波向圖

V14CSAX0.1HA V14CHLY0.1H0 V151SAX0.1HA V151HLY0.1H0 V152SAX0.1HA V152HLY0.1H0  
V153SAX0.1HA V153HLY0.1H0 V154SAX0.1HA V154HLY0.1H0 V155SAX0.1HA V155HLY0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

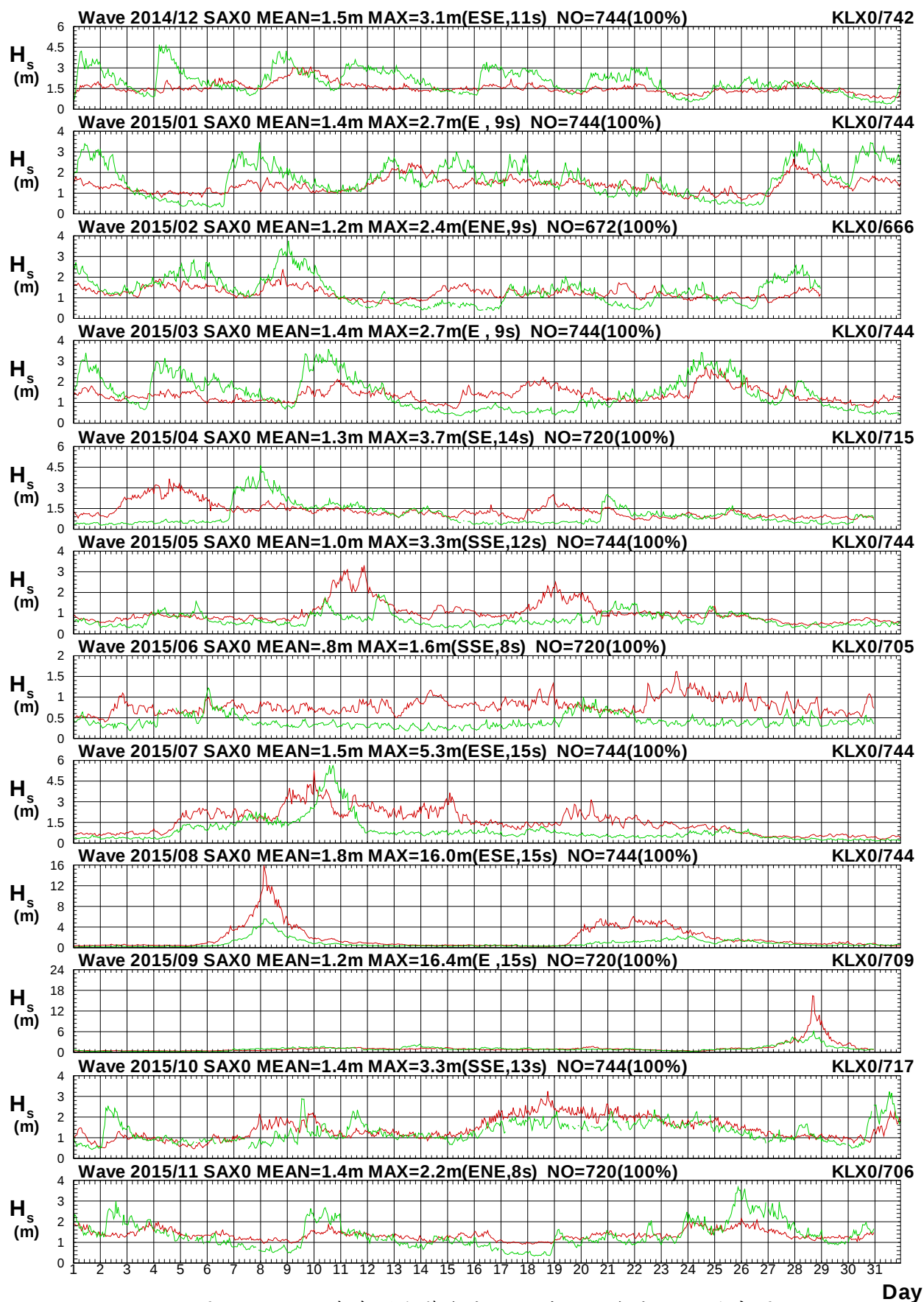


圖 2.6a 2015年每月宜蘭海域 X 站與北端海域 X 站波高圖

V14CSAX0.1HA V14CKLX0.1H0 V151SAX0.1HA V151KLX0.1H0 V152SAX0.1HA V152KLX0.1H0  
V153SAX0.1HA V153KLX0.1H0 V154SAX0.1HA V154KLX0.1H0 V155SAX0.1HA V155KLX0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

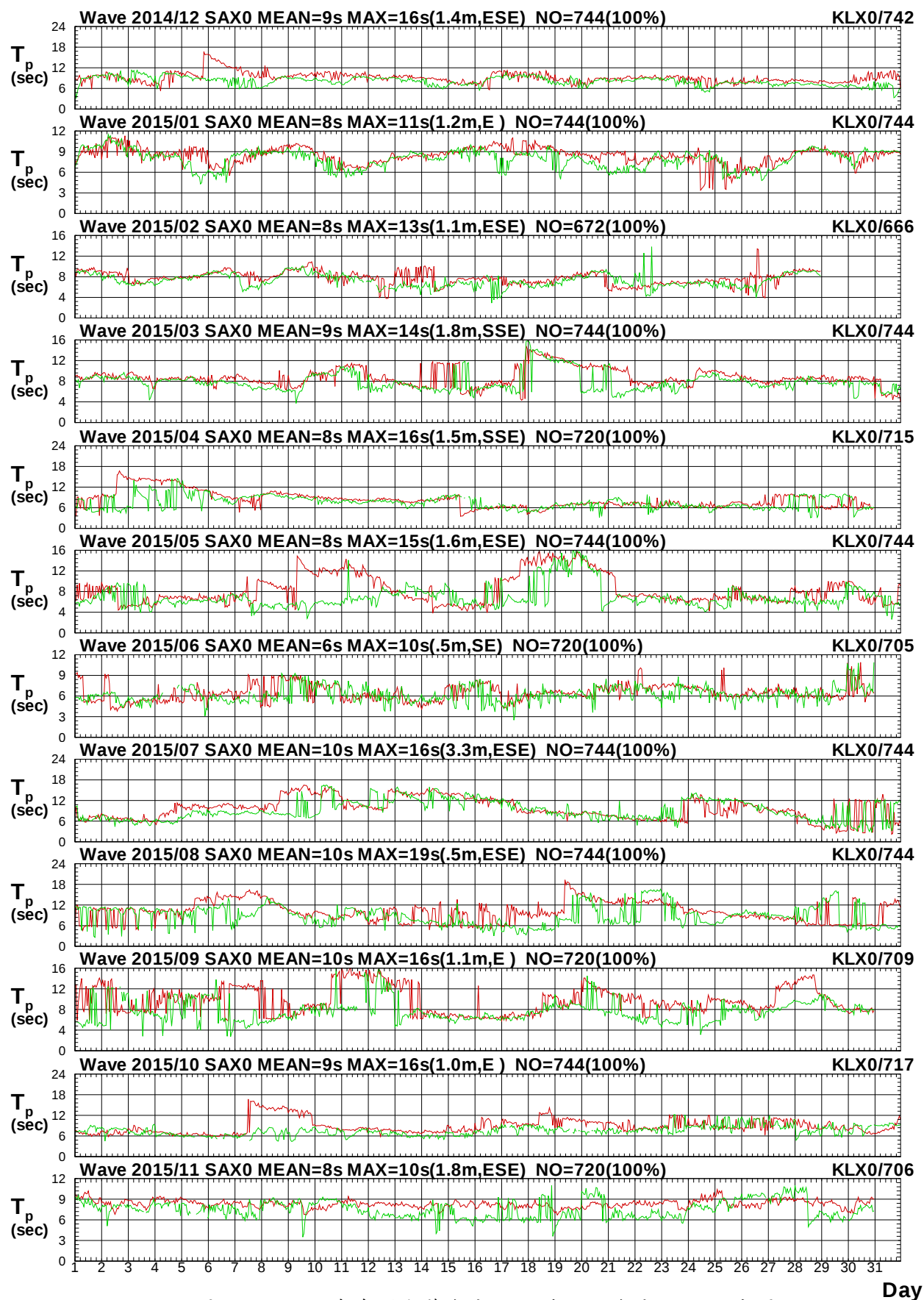


圖 2.6b 2015年每月宜蘭海域 X 站與北端海域 X 站週期圖

V14CSAX0.1HA V14CKLX0.1H0 V151SAX0.1HA V151KLX0.1H0 V152SAX0.1HA V152KLX0.1H0  
V153SAX0.1HA V153KLX0.1H0 V154SAX0.1HA V154KLX0.1H0 V155SAX0.1HA V155KLX0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

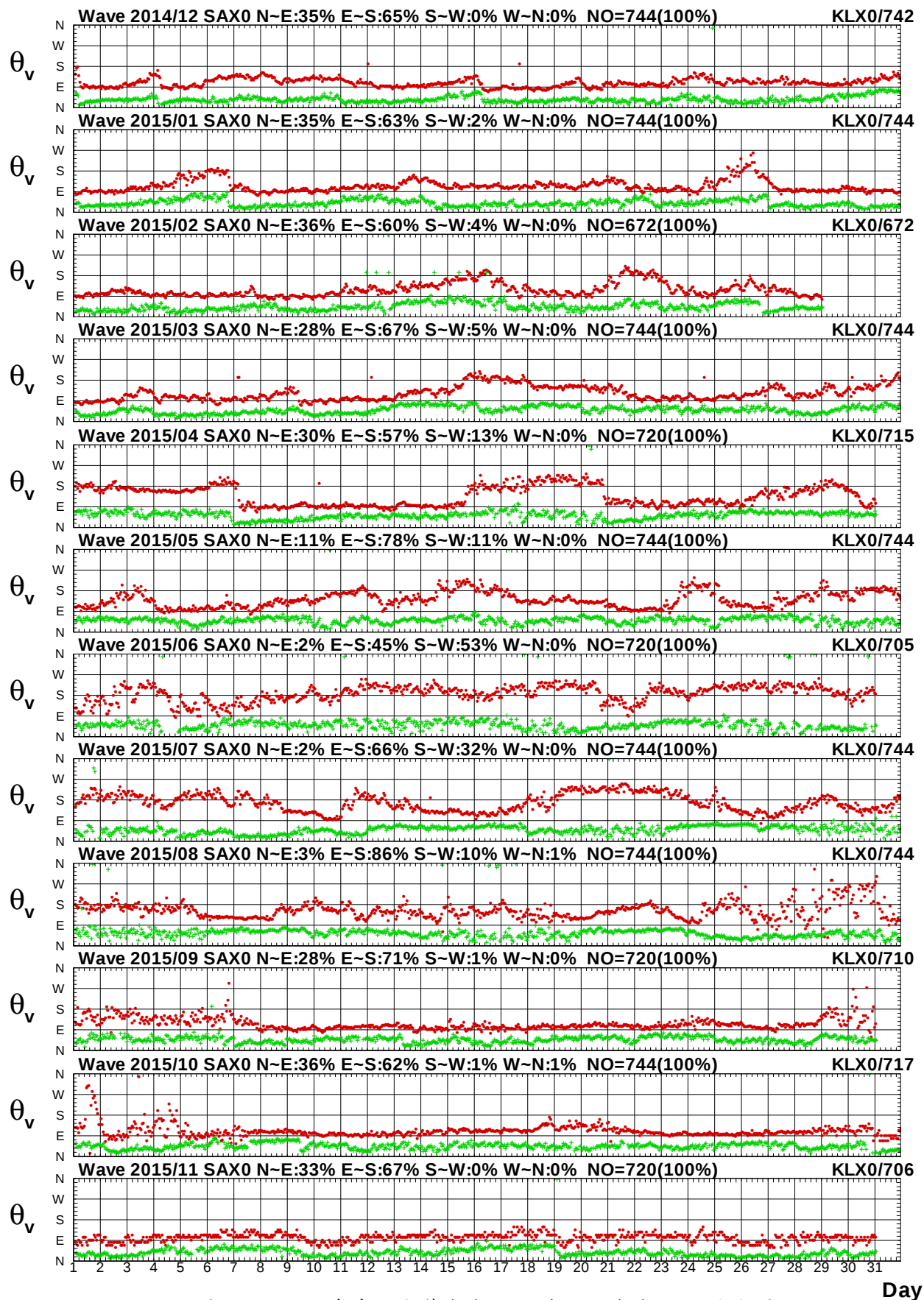


圖 2.6c 2015年每月宜蘭海域 X 站與北端海域 X 站波向圖

V14CSAX0.1HA V14CKLX0.1H0 V151SAX0.1HA V151KLX0.1H0 V152SAX0.1HA V152KLX0.1H0  
V153SAX0.1HA V153KLX0.1H0 V154SAX0.1HA V154KLX0.1H0 V155SAX0.1HA V155KLX0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

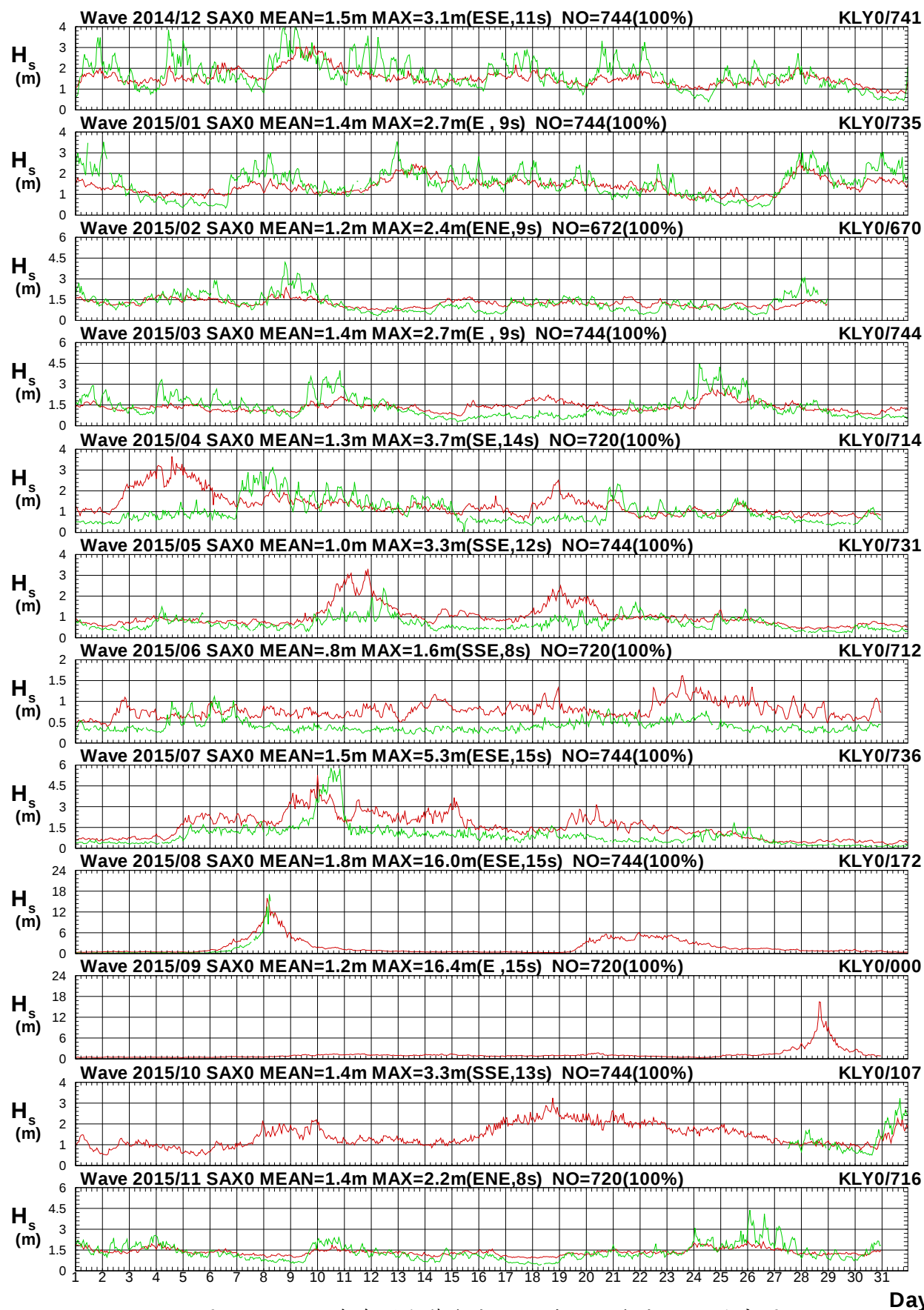


圖 2.7a 2015年每月宜蘭海域 X 站與北端海域 Y 站波高圖

V14CSAX0.1HA V14CKLY0.1H0 V151SAX0.1HA V151KLY0.1H0 V152SAX0.1HA V152KLY0.1H0  
V153SAX0.1HA V153KLY0.1H0 V154SAX0.1HA V154KLY0.1H0 V155SAX0.1HA V155KLY0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

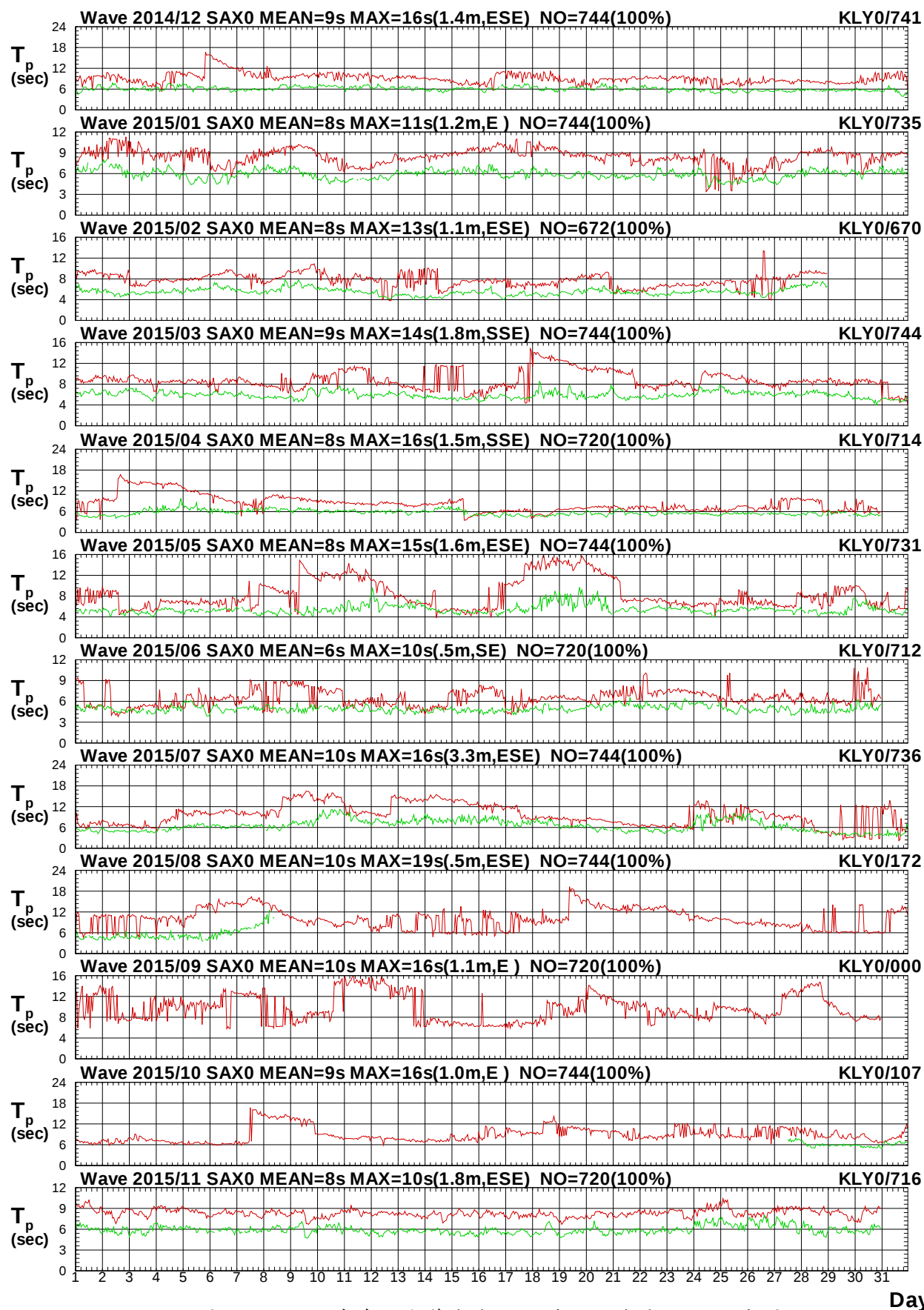


圖 2.7b 2015年每月宜蘭海域 X 站與北端海域 Y 站週期圖

V14CSAX0.1HA V14CKLY0.1H0 V151SAX0.1HA V151KLY0.1H0 V152SAX0.1HA V152KLY0.1H0  
V153SAX0.1HA V153KLY0.1H0 V154SAX0.1HA V154KLY0.1H0 V155SAX0.1HA V155KLY0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

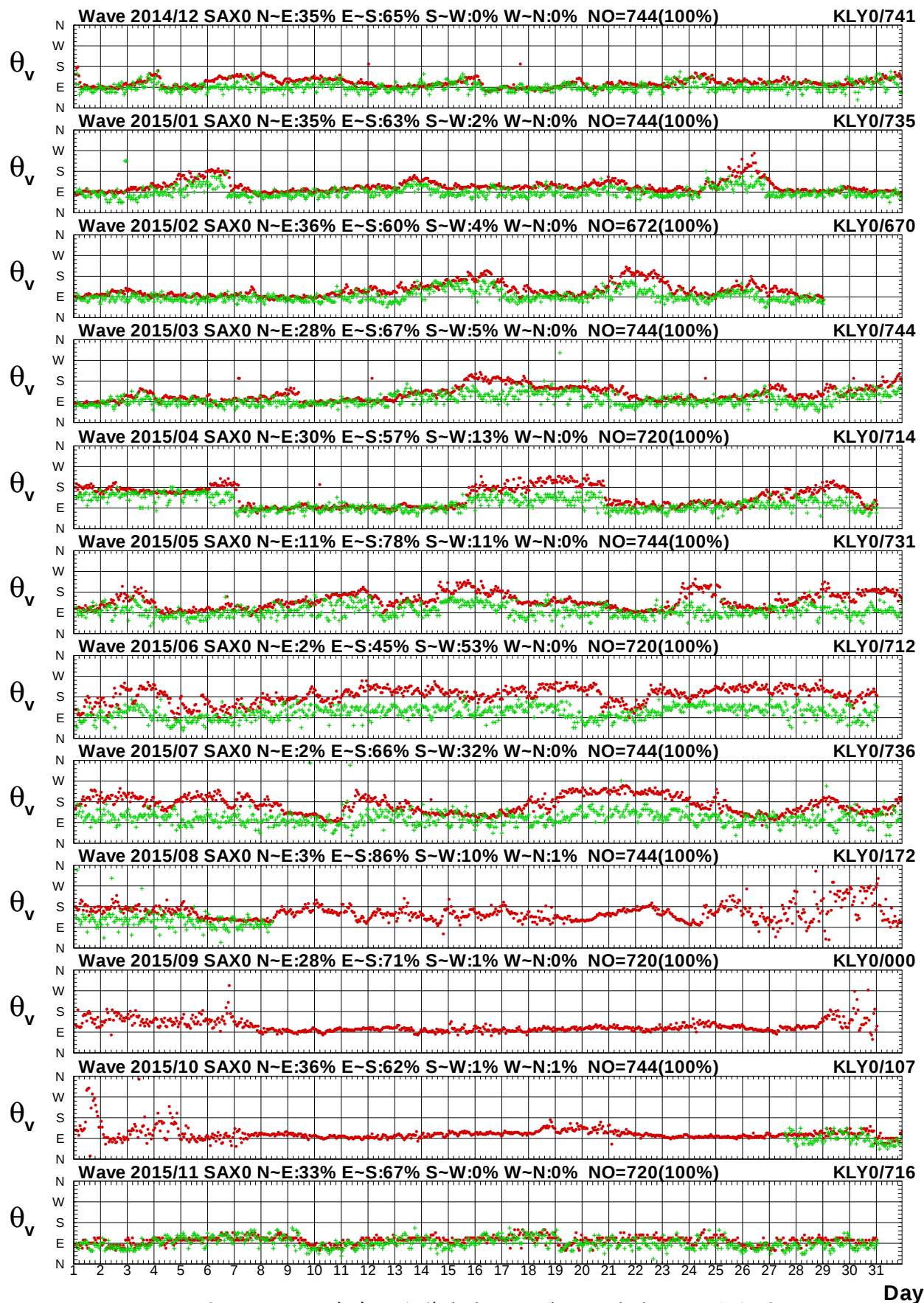


圖 2.7c 2015年每月宜蘭海域 X 站與北端海域 Y 站波向圖

V14CSAX0.1HA V14CKLY0.1H0 V151SAX0.1HA V151KLY0.1H0 V152SAX0.1HA V152KLY0.1H0  
V153SAX0.1HA V153KLY0.1H0 V154SAX0.1HA V154KLY0.1H0 V155SAX0.1HA V155KLY0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

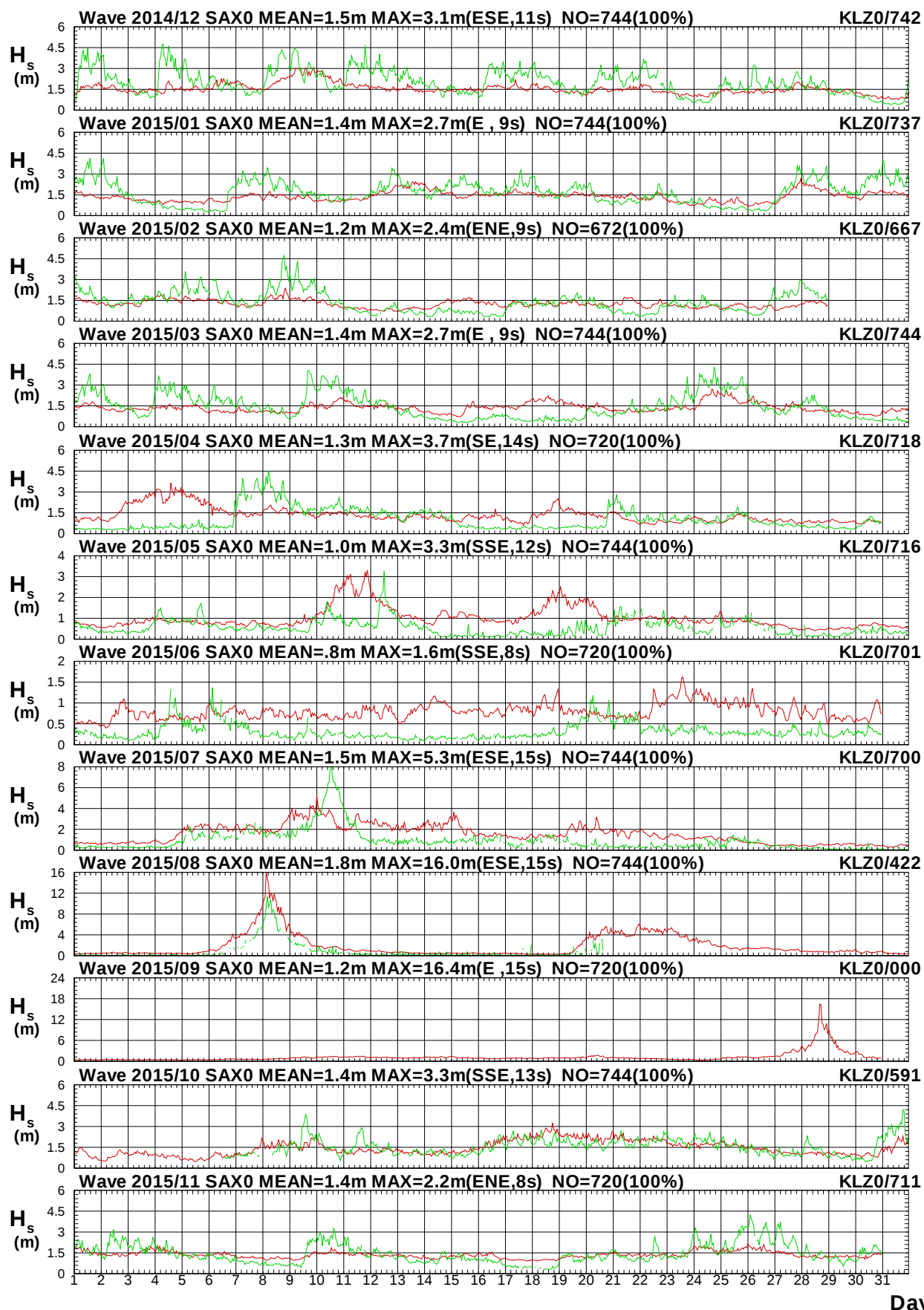


圖 2.8a 2015年每月宜蘭海域 X 站與北端海域 Z 站波高圖

V14CSAX0.1HA V14CKLZ0.1H0 V151SAX0.1HA V151KLZ0.1H0 V152SAX0.1HA V152KLZ0.1H0  
V153SAX0.1HA V153KLZ0.1H0 V154SAX0.1HA V154KLZ0.1H0 V155SAX0.1HA V155KLZ0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

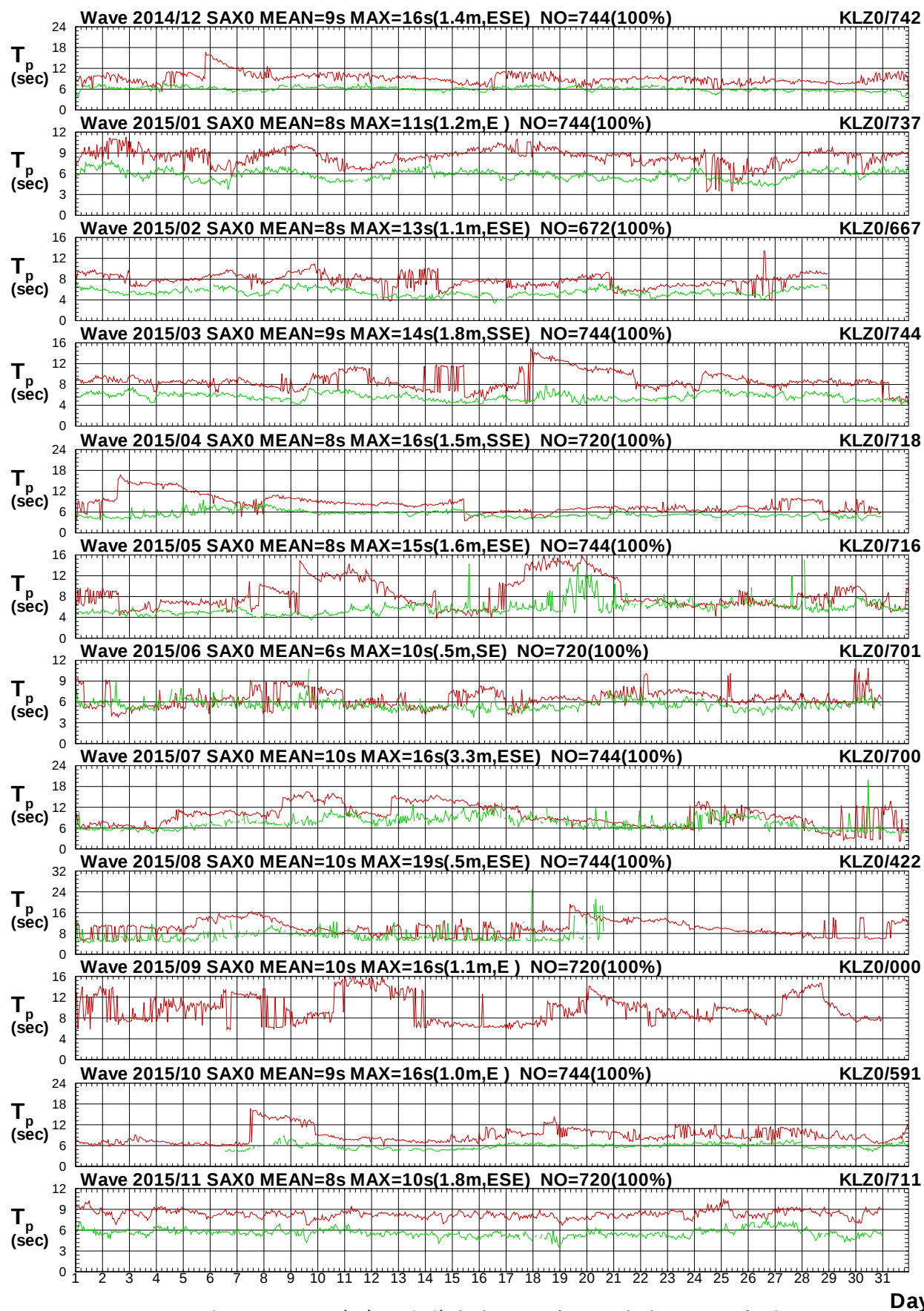


圖 2.8b 2015年每月宜蘭海域 X 站與北端海域 Z 站週期圖

V14CSAX0.1HA V14CKLZ0.1H0 V151SAX0.1HA V151KLZ0.1H0 V152SAX0.1HA V152KLZ0.1H0  
V153SAX0.1HA V153KLZ0.1H0 V154SAX0.1HA V154KLZ0.1H0 V155SAX0.1HA V155KLZ0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

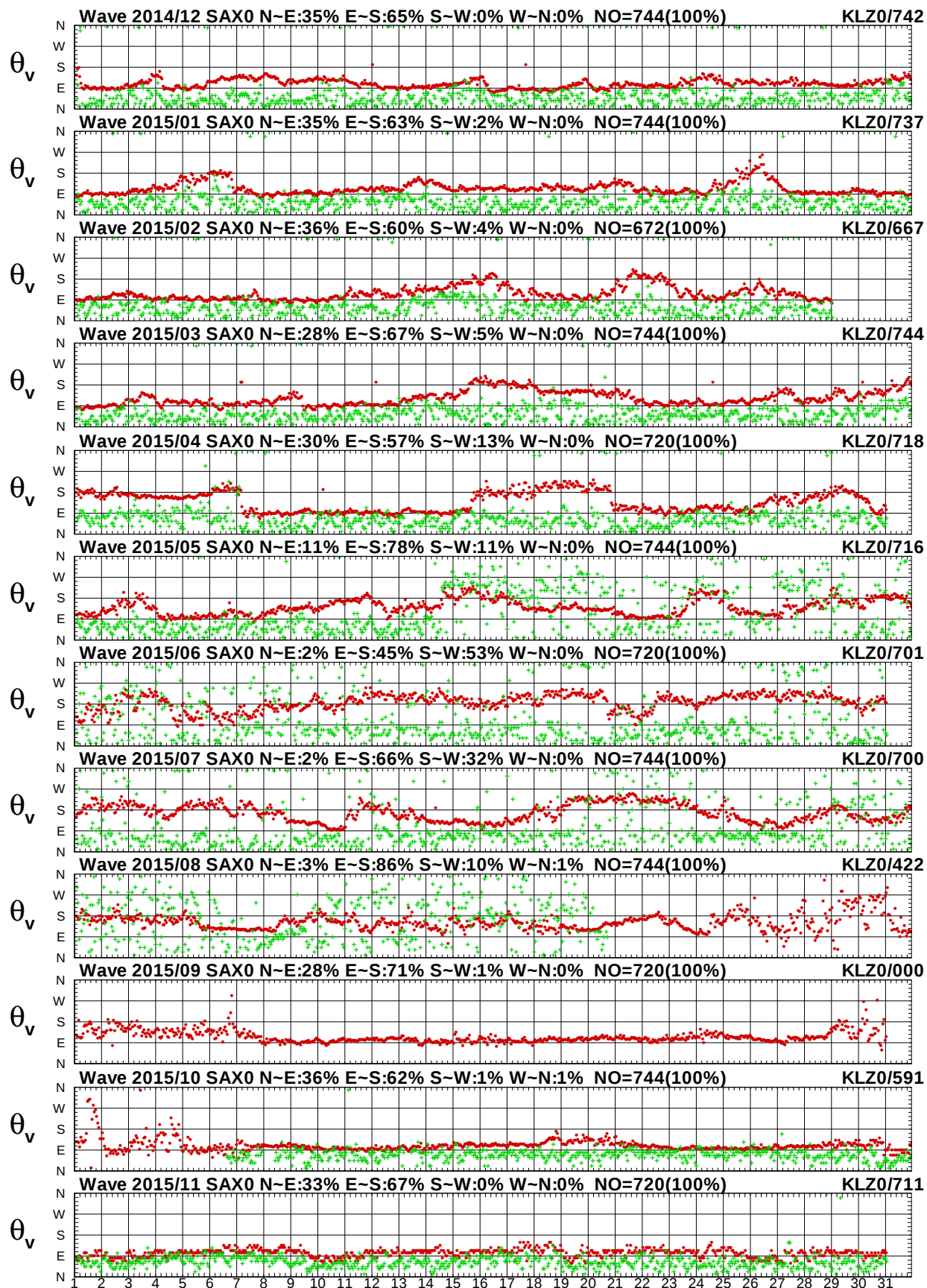


圖 2.8c 2015 年每月宜蘭海域 X 站與北端海域 Z 站波向圖

V14CSAX0.1HA V14CKLZ0.1H0 V151SAX0.1HA V151KLZ0.1H0 V152SAX0.1HA V152KLZ0.1H0  
V153SAX0.1HA V153KLZ0.1H0 V154SAX0.1HA V154KLZ0.1H0 V155SAX0.1HA V155KLZ0.1H0

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# Wave H<sub>s</sub> in Yi-Lan Seas of SAX0 at 2015

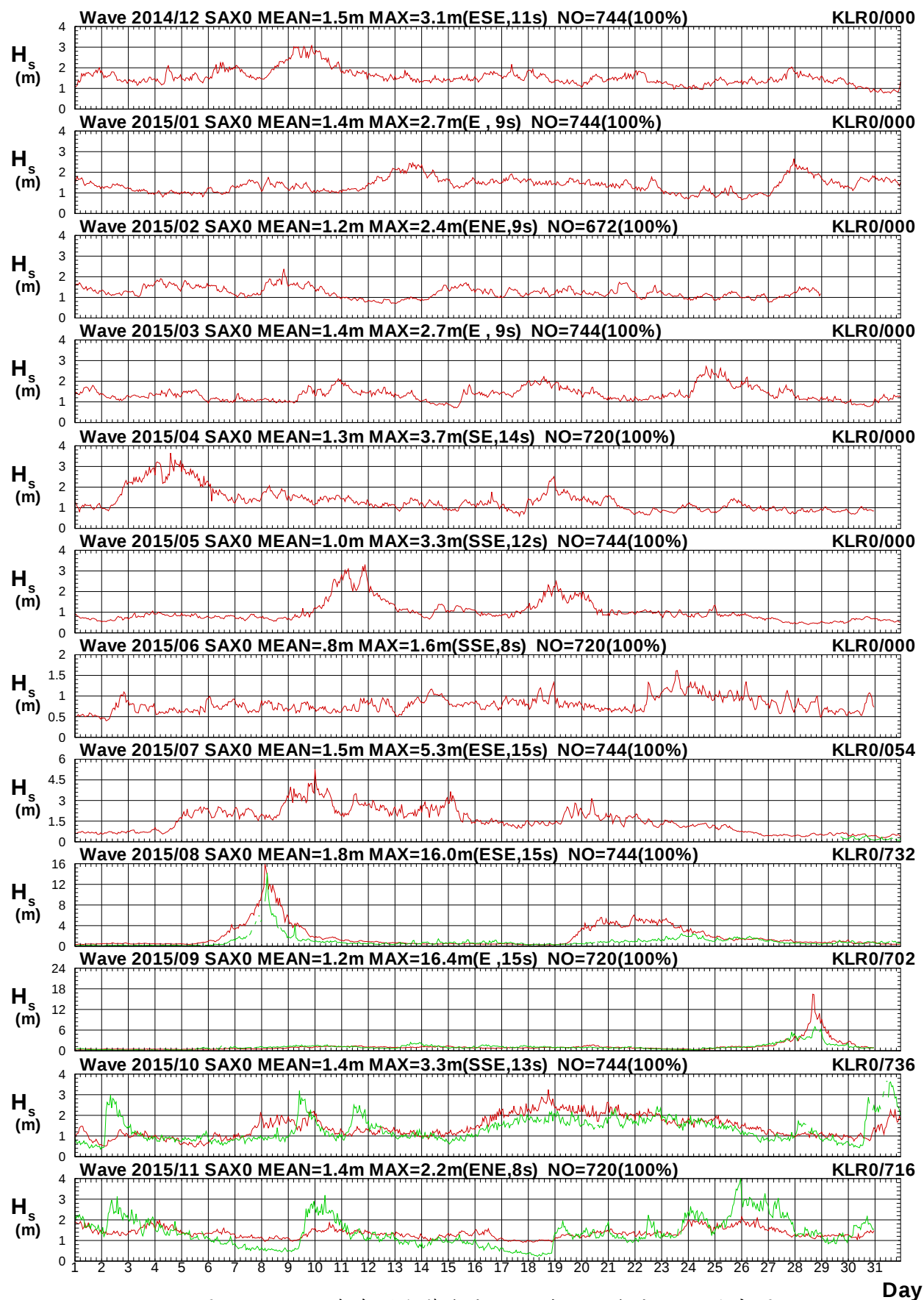


圖 2.9a 2015年每月宜蘭海域 X 站與北端海域 R 站波高圖

V14CSAX0.1HA V14CKLR0.1H0 V151SAX0.1HA V151KLR0.1H0 V152SAX0.1HA V152KLR0.1H0  
V153SAX0.1HA V153KLR0.1H0 V154SAX0.1HA V154KLR0.1H0 V155SAX0.1HA V155KLR0.1H0

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# Wave $T_p$ in Yi-Lan Seas of SAX0 at 2015

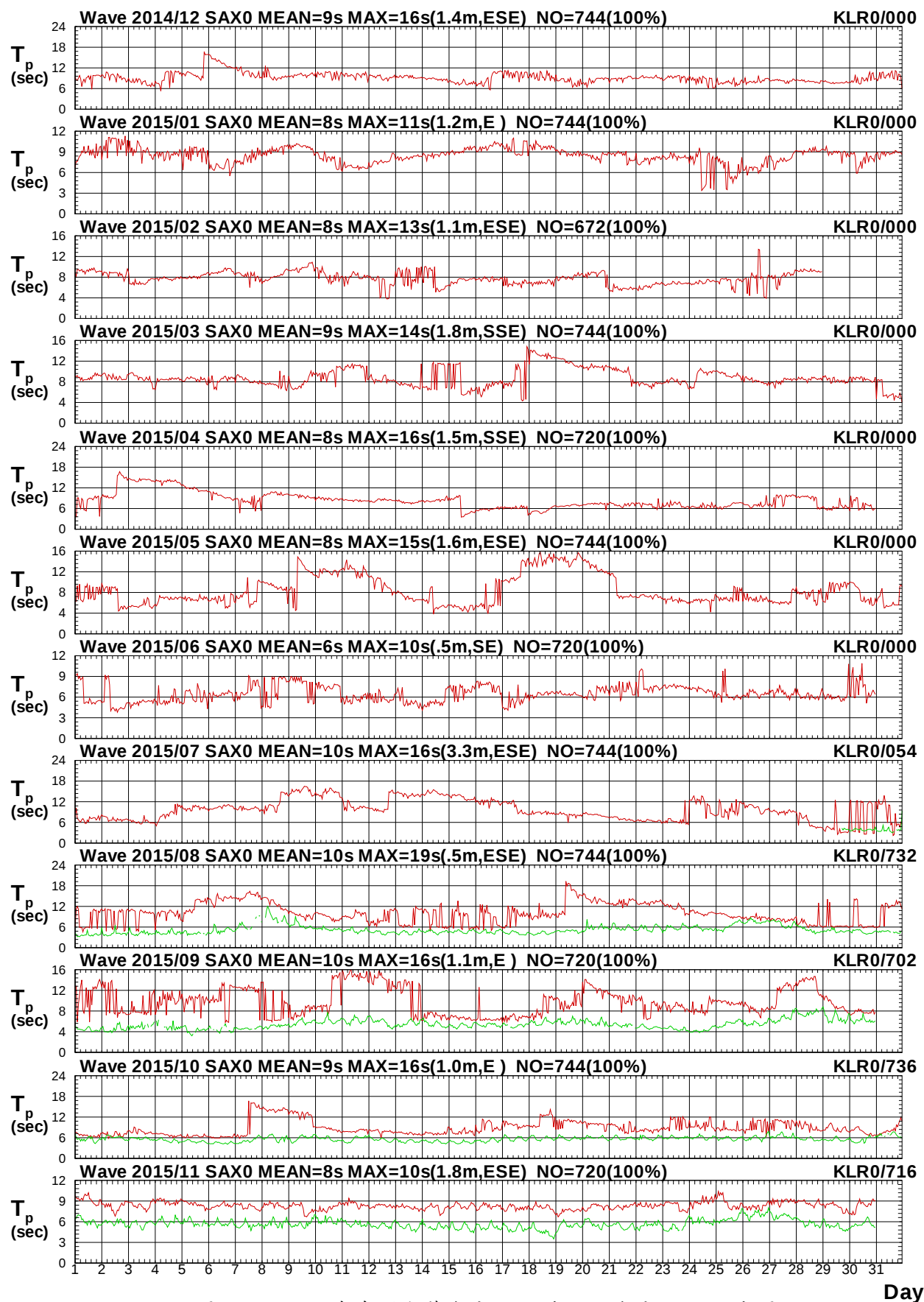


圖 2.9b 2015年每月宜蘭海域 X 站與北端海域 R 站週期圖

V14CSAX0.1HA V14CKLR0.1H0 V151SAX0.1HA V151KLR0.1H0 V152SAX0.1HA V152KLR0.1H0  
V153SAX0.1HA V153KLR0.1H0 V154SAX0.1HA V154KLR0.1H0 V155SAX0.1HA V155KLR0.1H0

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# Wave Direction in Yi-Lan Seas of SAX0 at 2015

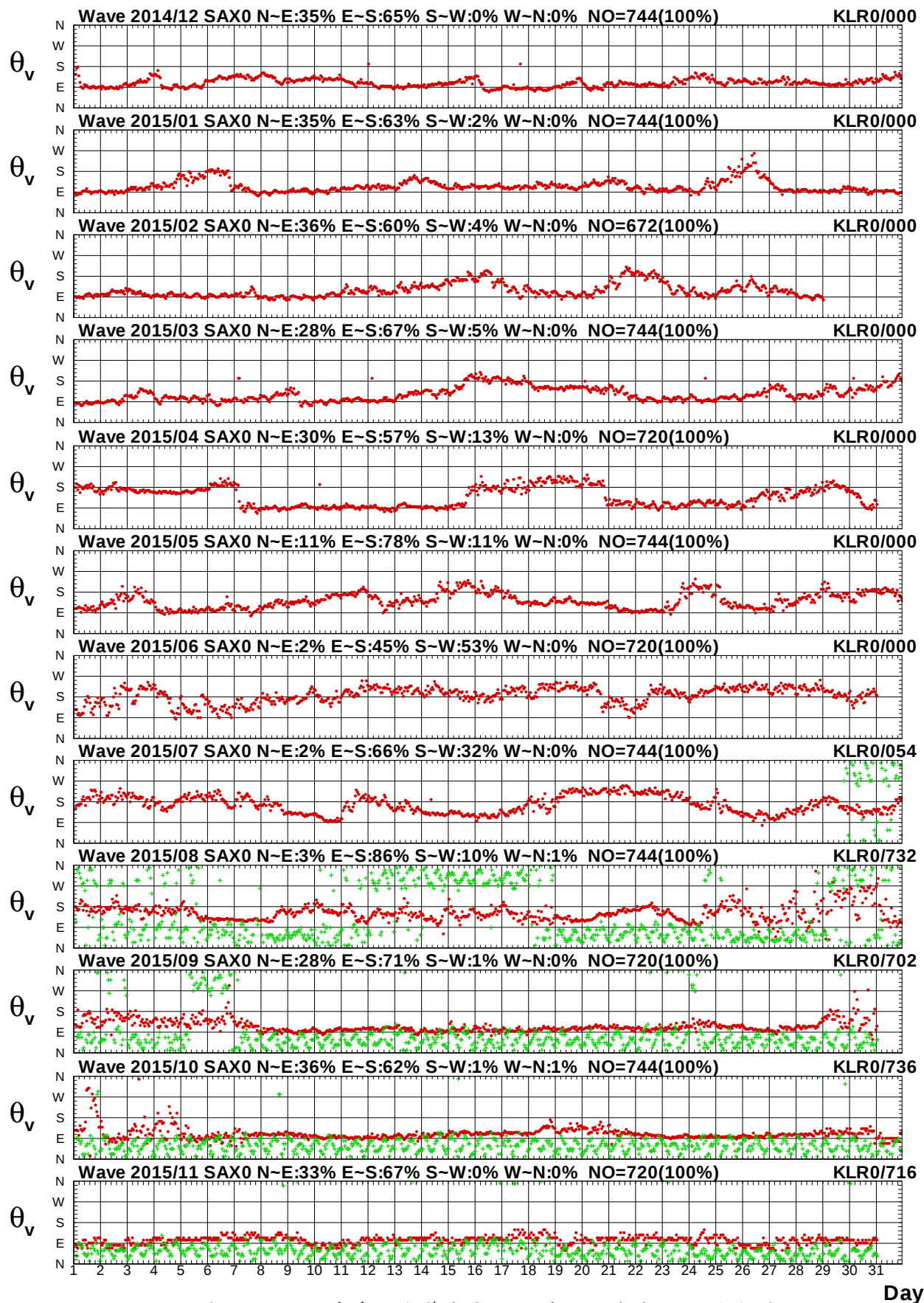


圖 2.9c 2015 年每月宜蘭海域 X 站與北端海域 R 站波向圖

V14CSAX0.1HA V14CKLR0.1H0 V151SAX0.1HA V151KLR0.1H0 V152SAX0.1HA V152KLR0.1H0  
V153SAX0.1HA V153KLR0.1H0 V154SAX0.1HA V154KLR0.1H0 V155SAX0.1HA V155KLR0.1H0

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### 第三章 2015 年宜蘭海域觀測潮汐資料

宜蘭海域潮汐之觀測係本中心於 2003 年 6 月本中心在蘇澳港(稱**測站 T**)安裝一具壓力式潮位儀監測系統，如附圖 3。另於 2002 年 7 月，在蘇澳港港口外 700 公尺水深約 25 公尺處(**測站 X**)安置 AWCP 即時傳送監測系統，也具量測水位功能。蘇澳港潮位站(**測站 F**)、烏石(**測站 J**)及福隆(**測站 K**)由中央氣象局設置。各測站歷年觀測潮汐資料蒐集概況如表 3。

潮位**測站 X**潮波流儀，以壓力感測器測得水壓變化時間序列，取樣方式為每一小時取前 10 分鐘之水位變化，取樣頻率為 2Hz，然後加以平均得出該小時之平均水位值。潮位資料之平均水位以觀測水位資料之平均值為基準，未經高程量測，與一般固定式潮位計不同。**測站 T**潮位資料取樣方式為每 6 分鐘量測一次水位變化。其他潮位資料由中央氣象局提供。

本潮汐年報以取經檢核或修補後之 **T 站**及 **K 站**資料作為**主要觀測站**，2015 年各觀測站修補前每月觀測潮汐資料記錄期間統計表，如表 3.1a，2015 年各觀測站修補後每月觀測潮汐資料記錄期間統計表，如表 3.1b，**主要觀測站修補前後**每月潮汐歷線比較圖，如圖 3.?.1，**主要觀測站與調和分析計算潮位**每月潮汐歷線比較圖，如圖 3.?.2，**主要觀測站與次要觀測站**每月潮汐歷線比較圖，如圖 3.?.3 以後。

表 3 宜蘭海域觀測潮汐資料蒐集概況表(統計時間至 2015 年 11 月)

| 測站 | 緯度         | 經度          | 觀測期間                 | 觀測單位  | 備註     |
|----|------------|-------------|----------------------|-------|--------|
| T  | 24°35'33"N | 121°51'56"E | 2003/06-2015/11(觀測中) | 港研中心  | 蘇澳港潮位計 |
| X  | 24°35'23"N | 121°53'07"E | 2002/08-2015/11(觀測中) | 港研中心  | AWCP   |
| F  | 24°35'33"N | 121°51'56"E | 1981/01-2015/11(觀測中) | 中央氣象局 | 蘇澳港潮位站 |
| J  |            |             | 2013/12-2015/11(觀測中) | 中央氣象局 | 烏石潮位站  |
| K  |            |             | 2013/12-2015/11(觀測中) | 中央氣象局 | 福隆潮位站  |

# 宜蘭海域



圖 3 宜蘭海域潮汐觀測站位置示意圖

表3.1a 2015年每月宜蘭海域修補前各測站觀測潮汐資料紀錄統計表

| 年/月 港區   | 蘇澳海域          |              | 蘇澳海域         |              | 蘇澳海域         |             | 蘇澳海域 |  | 蘇澳海域 |  |
|----------|---------------|--------------|--------------|--------------|--------------|-------------|------|--|------|--|
| 測站       | T             | X            | F            | J            | K            | S           |      |  |      |  |
| 2014/12月 | 744 (100%)    | 731 (98.3%)  | 743 (99.9%)  | 726 (97.6%)  | 744 (100%)   | 744 (100%)  | *    |  | *    |  |
| 2015/ 1月 | 744 (100%)    | 744 (100%)   | 550 (73.9%)  | 564 (75.8%)  | 558 (75.0%)  | 744 (100%)  | *    |  | *    |  |
| 2015/ 2月 | 672 (100%)    | 672 (100%)   | *            | *            | *            | 672 (100%)  | *    |  | *    |  |
| 2015/ 3月 | 744 (100%)    | 741 (99.6%)  | 126 (16.9%)  | 128 (17.2%)  | 129 (17.3%)  | 744 (100%)  | *    |  | *    |  |
| 2015/ 4月 | 720 (100%)    | 719 (99.9%)  | 397 (55.1%)  | 397 (55.1%)  | 388 (53.9%)  | 346 (48.1%) | *    |  | *    |  |
| 2015/ 5月 | 744 (100%)    | 744 (100%)   | 259 (34.8%)  | 269 (36.2%)  | 244 (32.8%)  | 36 ( 4.8%)  | *    |  | *    |  |
| 2015/ 6月 | 720 (100%)    | 717 (99.6%)  | 507 (70.4%)  | 476 (66.1%)  | 482 (66.9%)  | 595 (82.6%) | *    |  | *    |  |
| 2015/ 7月 | 744 (100%)    | 744 (100%)   | 346 (46.5%)  | 416 (55.9%)  | 330 (44.4%)  | 744 (100%)  | *    |  | *    |  |
| 2015/ 8月 | 742 (99.7%)   | 741 (99.6%)  | 574 (77.2%)  | 581 (78.1%)  | 581 (78.1%)  | 742 (99.7%) | *    |  | *    |  |
| 2015/ 9月 | 720 (100%)    | 720 (100%)   | 594 (82.5%)  | 620 (86.1%)  | 595 (82.6%)  | 720 (100%)  | *    |  | *    |  |
| 2015/10月 | 744 (100%)    | 662 (89.0%)  | 381 (51.2%)  | 367 (49.3%)  | 379 (50.9%)  | 55 ( 7.4%)  | *    |  | *    |  |
| 2015/11月 | 720 (100%)    | *            | 652 (90.6%)  | 633 (87.9%)  | 667 (92.6%)  | 720 (100%)  | *    |  | *    |  |
| 2015/冬季  | 2160 (100%)   | 2147 (99.4%) | 1293 (59.9%) | 1290 (59.7%) | 1302 (60.3%) | *           | *    |  | *    |  |
| 2015/春季  | 2208 (100%)   | 2204 (99.8%) | 782 (35.4%)  | 794 (36.0%)  | 761 (34.5%)  | *           | *    |  | *    |  |
| 2015/夏季  | 2206 (99.9%)  | 2202 (99.7%) | 1427 (64.6%) | 1473 (66.7%) | 1393 (63.1%) | *           | *    |  | *    |  |
| 2015/秋季  | 2184 (100%)   | 1382 (63.3%) | 1627 (74.5%) | 1620 (74.2%) | 1641 (75.1%) | *           | *    |  | *    |  |
| 2015/整年  | 8758 (100.0%) | 7935 (90.6%) | 5129 (58.6%) | 5177 (59.1%) | 5097 (58.2%) | *           | *    |  | *    |  |
| 起始年月     | 2014/12       | 2014/12      | 2014/12      | 2014/12      | 2014/12      | *           | *    |  | *    |  |
| 結束年月     | 2015/11       | 2015/10      | 2015/11      | 2015/11      | 2015/11      | *           | *    |  | *    |  |

表3.1b 2015年每月宜蘭海域修補後各測站潮汐資料統計表

| 年/月 港區    | 蘇澳海域        |              | 蘇澳海域         |              | 蘇澳海域         |   | 蘇澳海域 |   | 蘇澳海域 |  | 蘇澳海域 |  |
|-----------|-------------|--------------|--------------|--------------|--------------|---|------|---|------|--|------|--|
| 測站        | T           | X            | F            | J            | K            | S |      |   |      |  |      |  |
| 2014/12 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 1 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 2 月 | 672 (100%)  | 672 (100%)   | *            | *            | *            | * | *    | * | *    |  |      |  |
| 2015/ 3 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 4 月 | 720 (100%)  | 720 (100%)   | 720 (100%)   | 720 (100%)   | 720 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 5 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 6 月 | 720 (100%)  | 720 (100%)   | 720 (100%)   | 720 (100%)   | 720 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 7 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 8 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/ 9 月 | 720 (100%)  | 720 (100%)   | 720 (100%)   | 720 (100%)   | 720 (100%)   | * | *    | * |      |  |      |  |
| 2015/10 月 | 744 (100%)  | 744 (100%)   | 744 (100%)   | 744 (100%)   | 744 (100%)   | * | *    | * |      |  |      |  |
| 2015/11 月 | 720 (100%)  | *            | 720 (100%)   | 720 (100%)   | 720 (100%)   | * | *    | * |      |  |      |  |
| 2015/冬季   | 2160 (100%) | 2160 (100%)  | 1488 (68.9%) | 1488 (68.9%) | 1488 (68.9%) | * | *    | * |      |  |      |  |
| 2015/春季   | 2208 (100%) | 2208 (100%)  | 2208 (100%)  | 2208 (100%)  | 2208 (100%)  | * | *    | * |      |  |      |  |
| 2015/夏季   | 2208 (100%) | 2208 (100%)  | 2208 (100%)  | 2208 (100%)  | 2208 (100%)  | * | *    | * |      |  |      |  |
| 2015/秋季   | 2184 (100%) | 1464 (67.0%) | 2184 (100%)  | 2184 (100%)  | 2184 (100%)  | * | *    | * |      |  |      |  |
| 2015/整年   | 8760 (100%) | 8040 (91.8%) | 8088 (92.3%) | 8088 (92.3%) | 8088 (92.3%) | * | *    | * |      |  |      |  |
| 起始年月      | 2014/12     | 2014/12      | 2014/12      | 2014/12      | 2014/12      | * | *    | * |      |  |      |  |
| 結束年月      | 2015/11     | 2015/10      | 2015/11      | 2015/11      | 2015/11      | * | *    | * |      |  |      |  |

# Tidal Level in Yi-Lan Seas of SAT0 at 2015

1 8 15 22

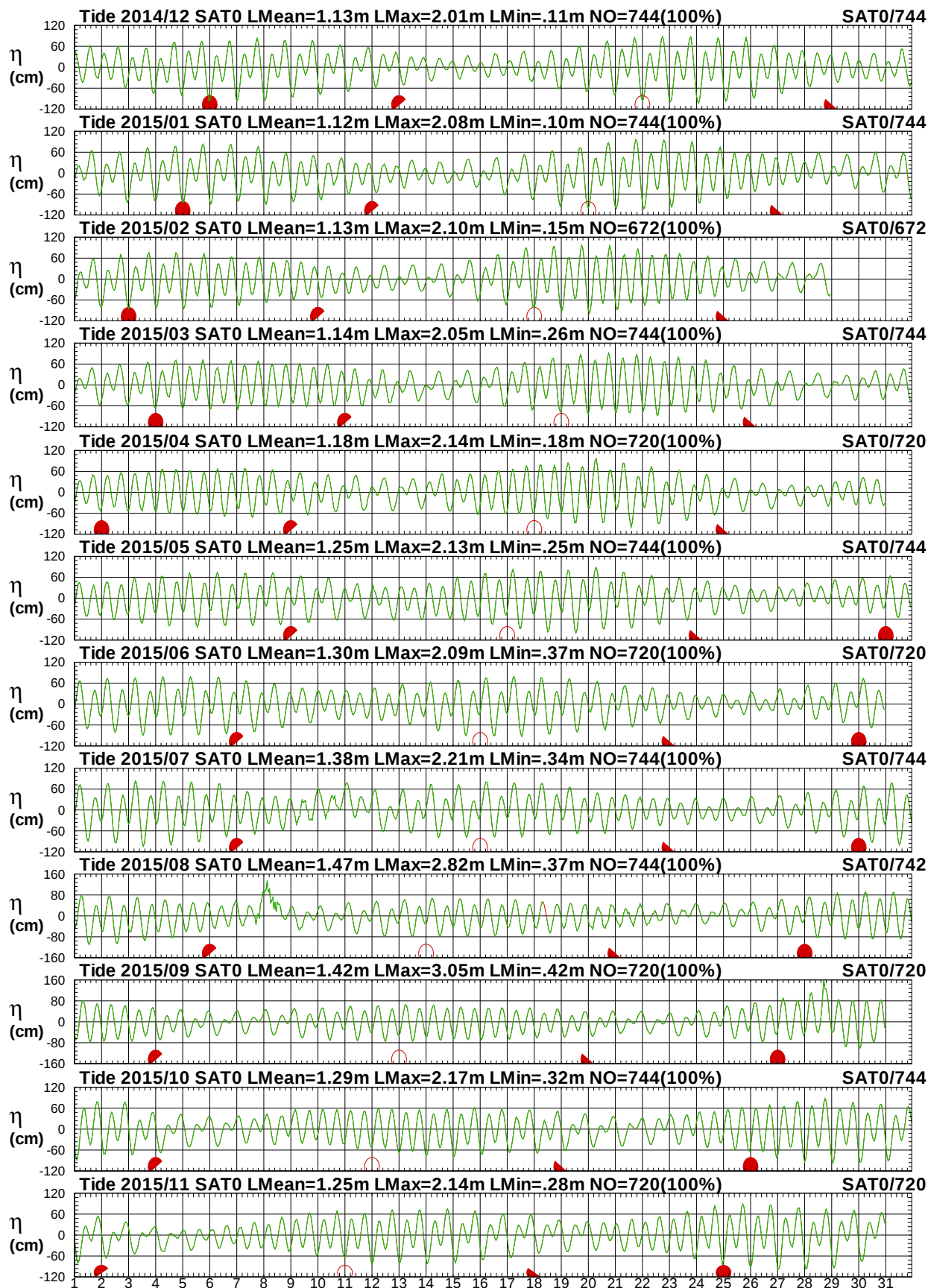


圖 3.1.1 2015 年每月宜蘭海域 T 站修補前後之潮位比較圖

T14CSAT0.1HA T14CSAT0.1H0 T151SAT0.1HA T151SAT0.1H0 T152SAT0.1HA T152SAT0.1H0  
T153SAT0.1HA T153SAT0.1H0 T154SAT0.1HA T154SAT0.1H0 T155SAT0.1HA T155SAT0.1H0

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# Tidal Level in Yi-Lan Seas of SAT0 at 2015

1 8 15 22

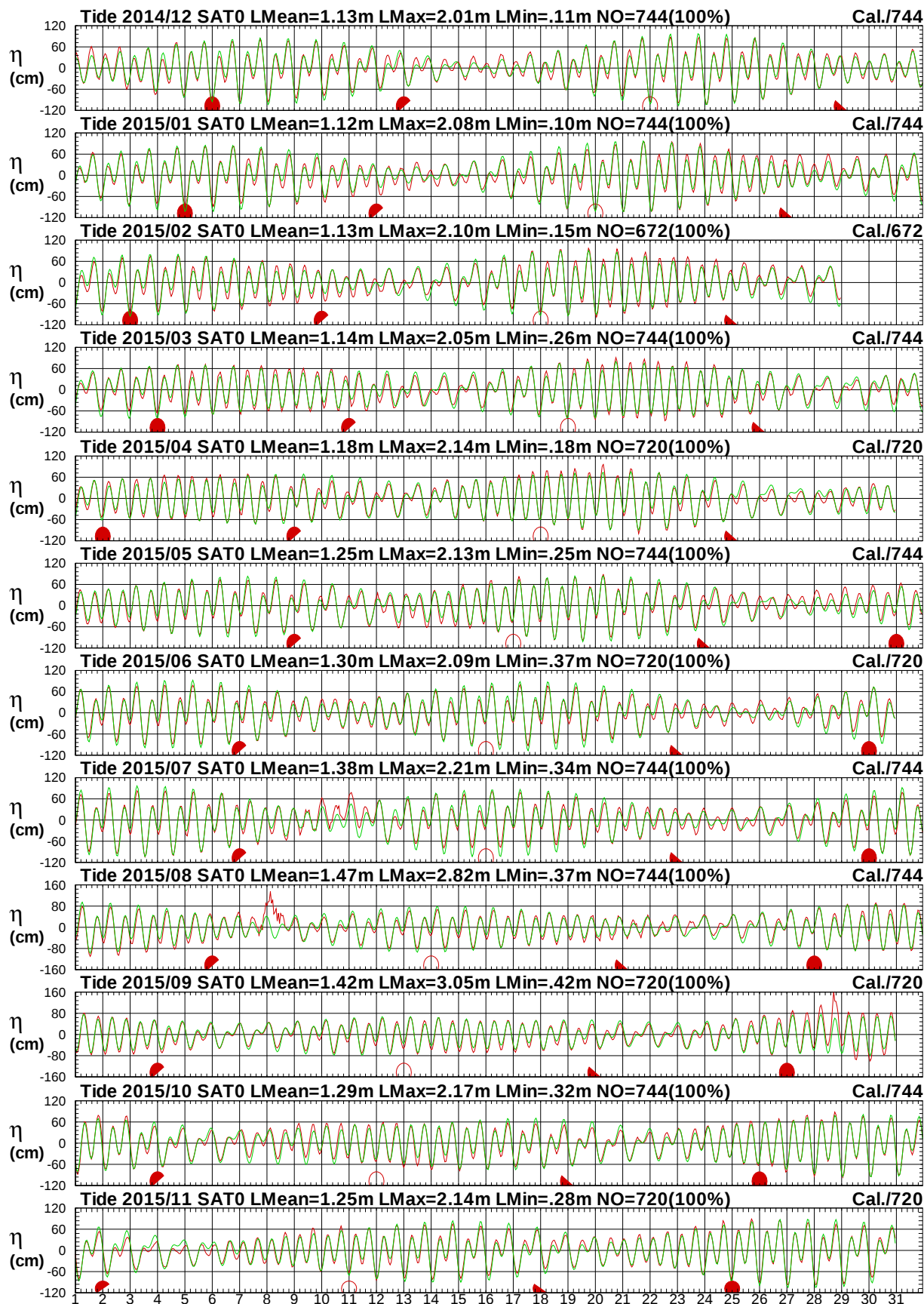


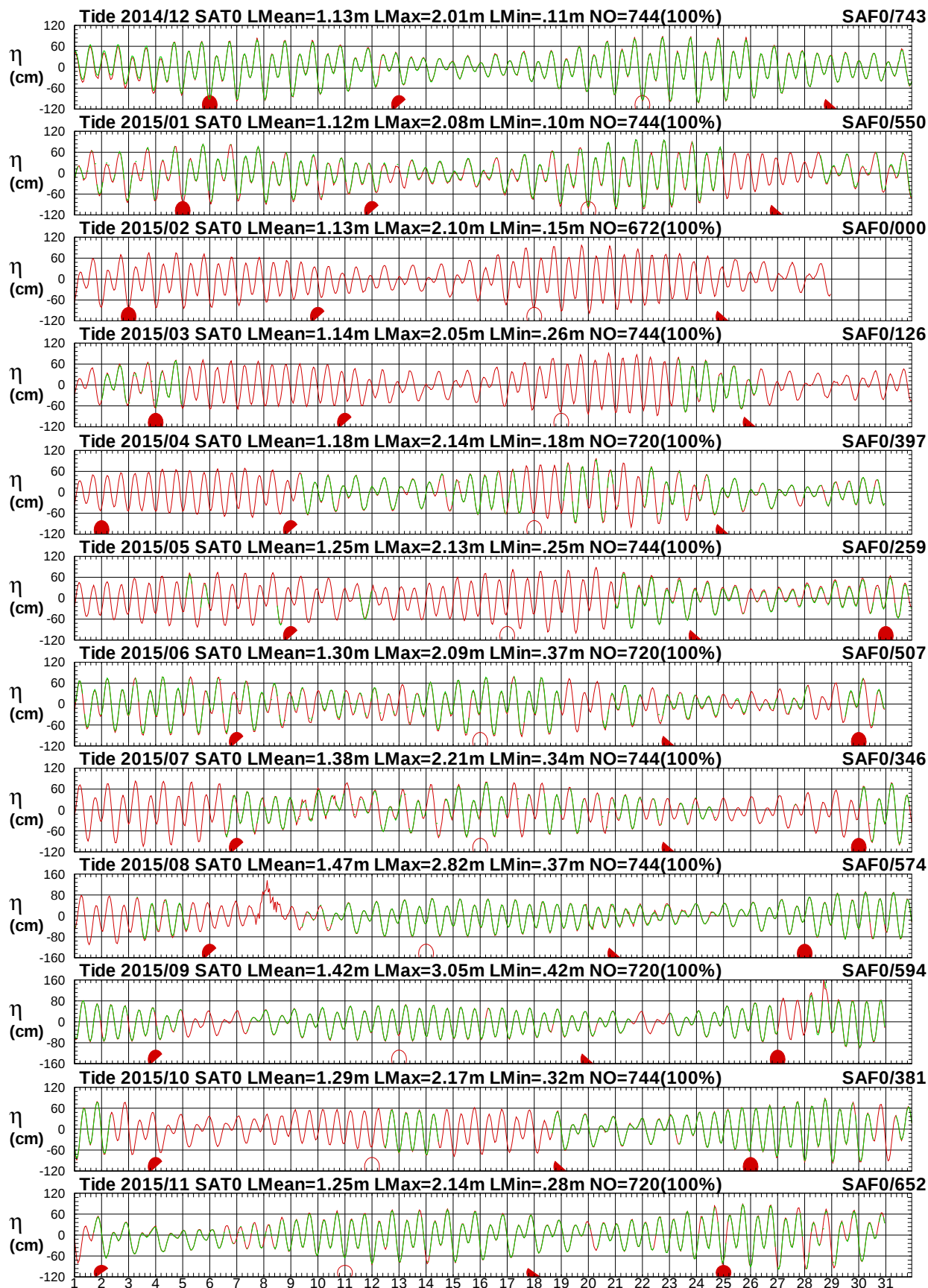
圖 3.1.2 2015 年每月宜蘭海域 T 站潮位歷線圖 (綠線: 天文潮)

T14CSAT0.1HA T14CSAT0.1HC T151SAT0.1HA T151SAT0.1HC T152SAT0.1HA T152SAT0.1HC  
T153SAT0.1HA T153SAT0.1HC T154SAT0.1HA T154SAT0.1HC T155SAT0.1HA T155SAT0.1HC

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# Tidal Level in Yi-Lan Seas of SAT0 at 2015

1 8 15 22



Day

圖 3.1.3 2015年每月宜蘭海域 T 站與 F 站潮位比較圖

T14CSAT0.1HA T14CSAF0.1H0 T151SAT0.1HA T151SAF0.1H0 T152SAT0.1HA T152SAF0.1H0

T153SAT0.1HA T153SAF0.1H0 T154SAT0.1HA T154SAF0.1H0 T155SAT0.1HA T155SAF0.1H0

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# Tidal Level in Yi-Lan Seas of SAT0 at 2015

1 8 15 22

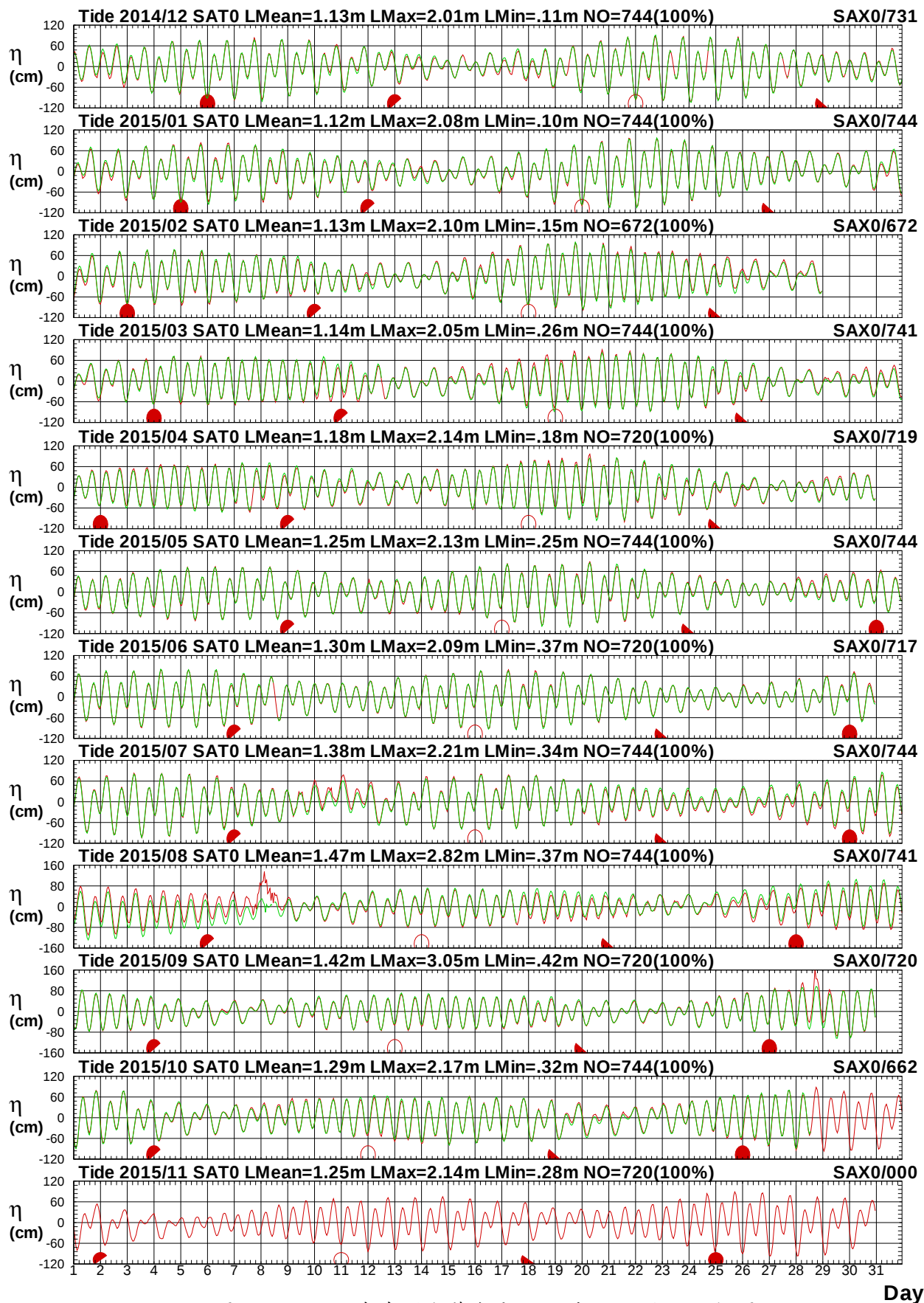


圖 3.1.4 2015年每月宜蘭海域 T 站與 X 站潮位比較圖

T14CSAT0.1HA T14CSAX0.1H0 T151SAT0.1HA T151SAX0.1H0 T152SAT0.1HA T152SAX0.1H0  
T153SAT0.1HA T153SAX0.1H0 T154SAT0.1HA T154SAX0.1H0 T155SAT0.1HA T155SAX0.1H0

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# Tidal Level in Yi-Lan Seas of SAT0 at 2015

1 8 15 22

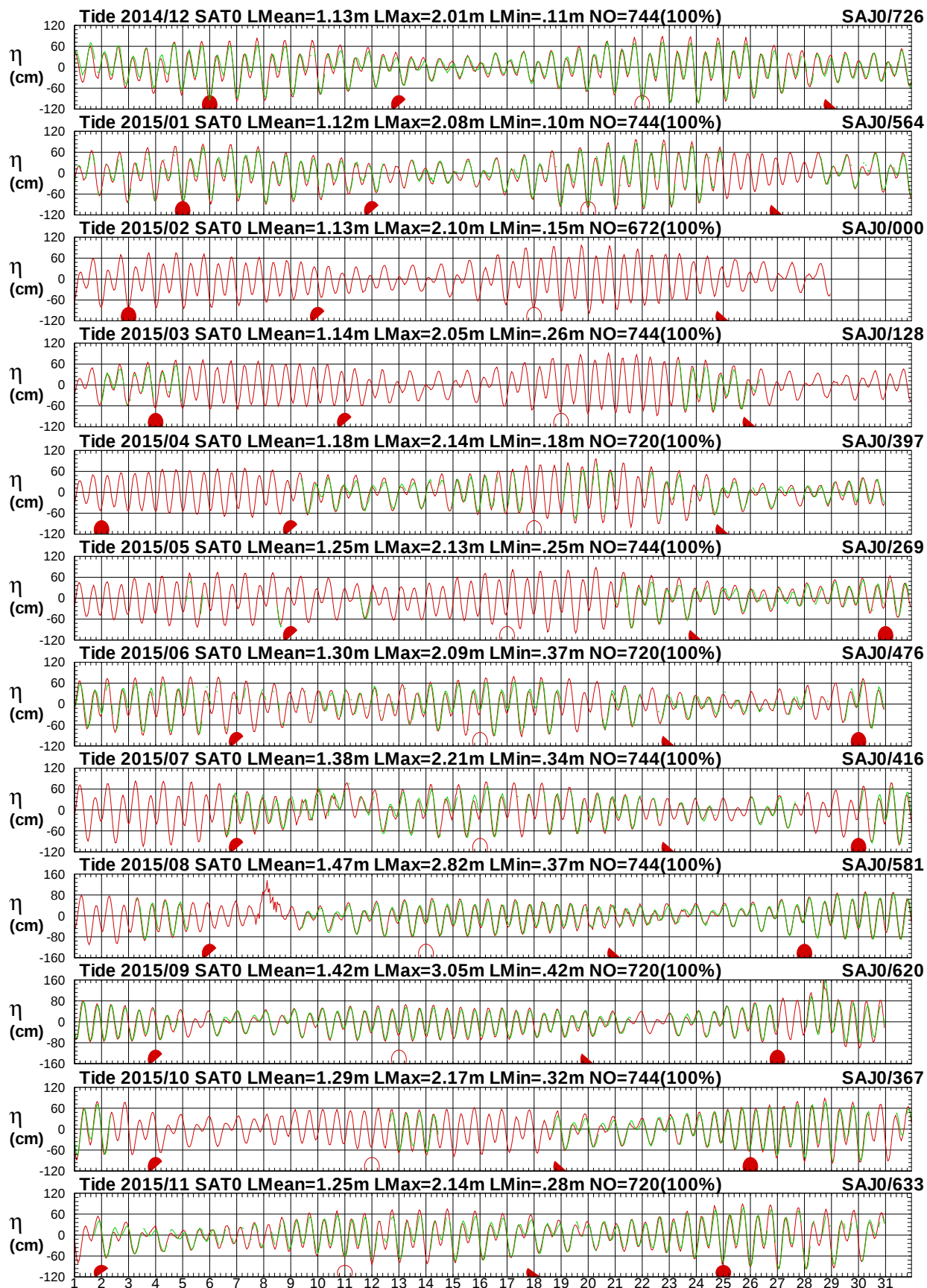


圖 3.1.5 2015年每月宜蘭海域 T 站與 J 站潮位比較圖

Day

T14CSAT0.1HA T14CSAJ0.1H0 T151SAT0.1HA T151SAJ0.1H0 T152SAT0.1HA T152SAJ0.1H0

T153SAT0.1HA T153SAJ0.1H0 T154SAT0.1HA T154SAJ0.1H0 T155SAT0.1HA T155SAJ0.1H0

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# Tidal Level in Yi-Lan Seas of SAK0 at 2015

1 8 15 22

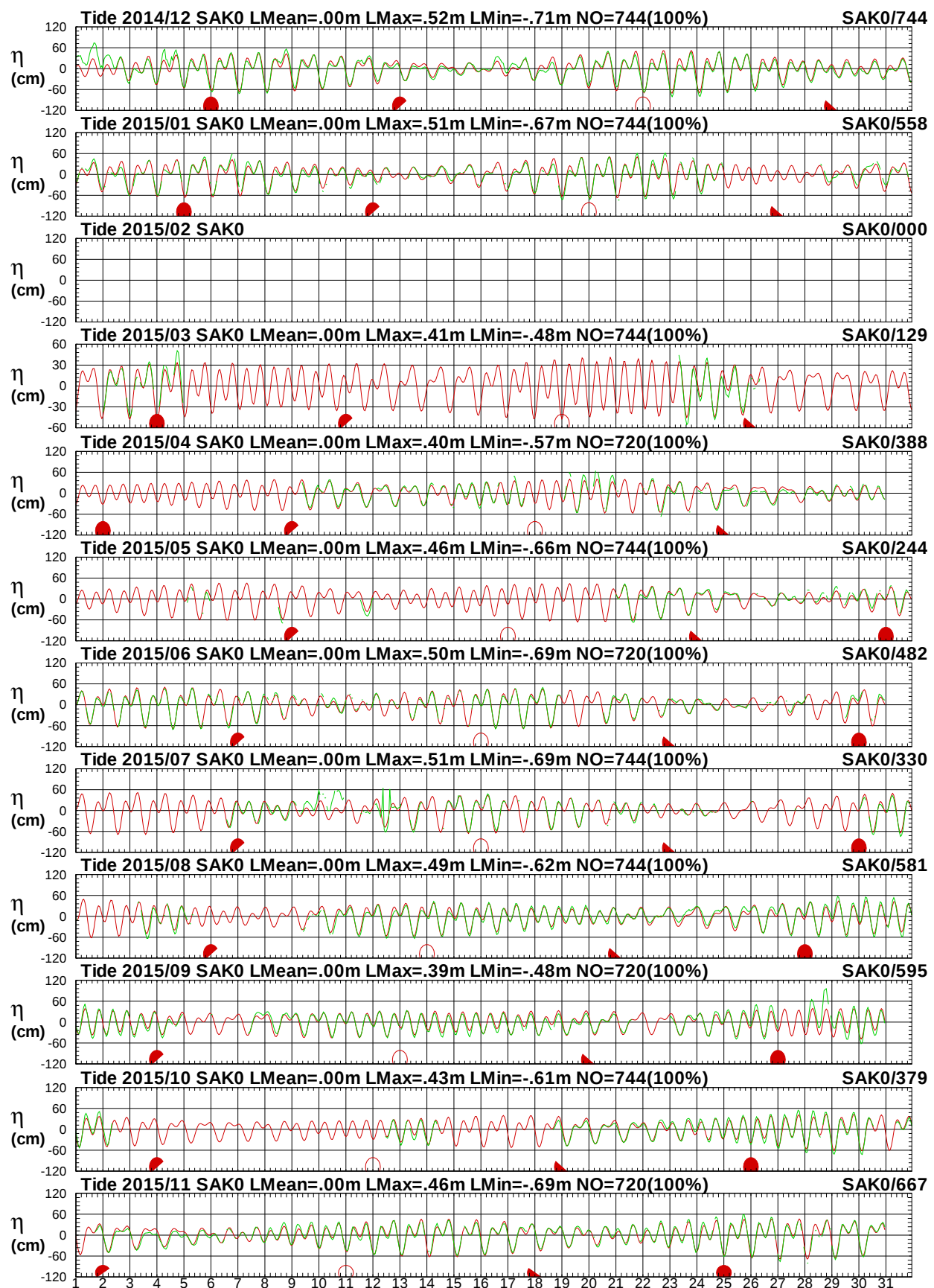


圖 3.2.1 2015年每月宜蘭海域 K 站修補前後之潮位比較圖

T14CSAK0.1HA T14CSAK0.1H0 T151SAK0.1HA T151SAK0.1H0 T152SAK0.1HA T152SAK0.1H0  
T153SAK0.1HA T153SAK0.1H0 T154SAK0.1HA T154SAK0.1H0 T155SAK0.1HA T155SAK0.1H0

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# Tidal Level in Yi-Lan Seas of SAK0 at 2015

1 8 15 22

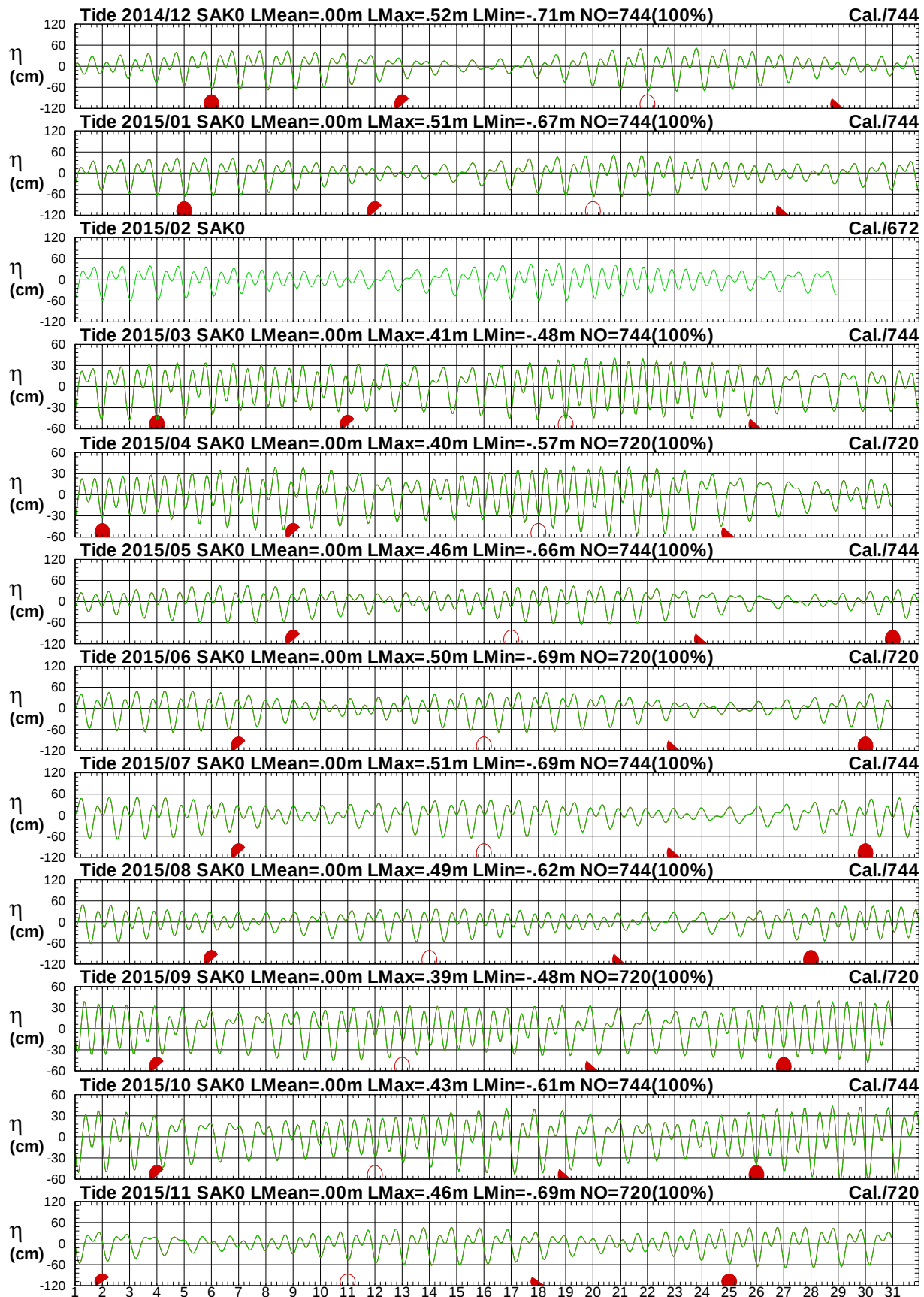


圖 3.2.2 2015 年每月宜蘭海域 K 站潮位歷線圖 (綠線: 天文潮)

T14CSAK0.1HA T14CSAK0.1HC T151SAK0.1HA T151SAK0.1HC T152SAK0.1HA T152SAK0.1HC

T153SAK0.1HA T153SAK0.1HC T154SAK0.1HA T154SAK0.1HC T155SAK0.1HA T155SAK0.1HC

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## 第四章 2015 年宜蘭海域觀測海流資料

本中心於 2002 年 7 月 19 日於蘇澳港外約 700m 附近(稱**測站 X**)，水深約 25 公尺處設置挪威 NORTEK 公司之剖面海流與表面波浪(波高、週期及波向)即時傳送監測系統(簡稱 AWCP)海流觀測站，其位置如附圖 4。

**測站 Y**(蘇澳外海浮標站)之海流儀屬水利署所有，各測站歷年觀測海流資料蒐集概況如表 4。

剖面海流流速的量測可以依照使用在不同水深即自固定在海床上之儀器位置到水表面來設定量測不同的間距，蘇澳港觀測站水深間距設定為 1 公尺；每小時連續量測 600 秒，再將總和平均代表其數樣每一間距層之海流流速、流向等資料，記錄在感應器內，並每隔 1 小時經由海底電纜傳訊回接收站之電腦中儲存。

本海流年報 2015 年各觀測站每月**觀測海流**資料記錄期間統計表，如表 4.1a，2015 年各觀測站每月**計算潮流**資料統計表，如表 4.1b。2015 年**各觀測站觀測海流與計算潮流(殘餘流)**歷線比較圖，**各觀測站觀測海流**與其他測站觀測海流歷線比較圖，如圖 4.1 以後。

表 4 宜蘭海域觀測海流資料蒐集概況表(統計時間至 2015 年 11 月)

| 測站 | 緯度         | 經度          | 觀測期間                 | 觀測單位 | 備註       |
|----|------------|-------------|----------------------|------|----------|
| X  | 24°35'23"N | 121°53'07"E | 2002/08-2015/11(觀測中) | 港研中心 | AWCP 蘇澳港 |
| Y  | 24°37'38"N | 121°52'36"E | 1999/09-2015/11(觀測中) | 水利署  | 蘇澳浮標站    |

# 宜蘭海域



圖 4 宜蘭海域海流觀測站位置示意圖

表4.1a 2015年每月宜蘭海域各測站觀測海流資料紀錄統計表

| 年/月 港區    | 蘇澳海域         | 蘇澳海域         | 蘇澳海域 | 蘇澳海域 | 蘇澳海域 | 蘇澳海域 | 蘇澳海域 | 蘇澳海域 |
|-----------|--------------|--------------|------|------|------|------|------|------|
| 測站        | X            | Y            |      |      |      |      |      |      |
| 2014/12 月 | 731 (98.3%)  | 743 (99.9%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 1 月 | 744 (100%)   | 594 (79.8%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 2 月 | 672 (100%)   | 353 (52.5%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 3 月 | 740 (99.5%)  | 486 (65.3%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 4 月 | 719 (99.9%)  | 428 (59.4%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 5 月 | 744 (100%)   | 299 (40.2%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 6 月 | 717 (99.6%)  | 175 (24.3%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 7 月 | 744 (100%)   | 381 (51.2%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 8 月 | 741 (99.6%)  | 120 (16.1%)  | *    | *    | *    | *    | *    | *    |
| 2015/ 9 月 | 720 (100%)   | *            | *    | *    | *    | *    | *    | *    |
| 2015/10 月 | 662 (89.0%)  | 376 (50.5%)  | *    | *    | *    | *    | *    | *    |
| 2015/11 月 | *            | 673 (93.5%)  | *    | *    | *    | *    | *    | *    |
| 2015/冬季   | 2147 (99.4%) | 1690 (78.2%) | *    | *    | *    | *    | *    | *    |
| 2015/春季   | 2203 (99.8%) | 1213 (54.9%) | *    | *    | *    | *    | *    | *    |
| 2015/夏季   | 2202 (99.7%) | 676 (30.6%)  | *    | *    | *    | *    | *    | *    |
| 2015/秋季   | 1382 (63.3%) | 1049 (48.0%) | *    | *    | *    | *    | *    | *    |
| 2015/整年   | 7934 (90.6%) | 4628 (52.8%) | *    | *    | *    | *    | *    | *    |
| 起始年月      | 2014/12      | 2014/12      | *    | *    | *    | *    | *    | *    |
| 結束年月      | 2015/10      | 2015/11      | *    | *    | *    | *    | *    | *    |

ST-X: 港灣技術研究中心觀測 X 站流速資料

表4.1b 2015年每月宜蘭海域計算潮流各測站資料統計表

| 年/月 港區    | 蘇澳海域 |        | 蘇澳海域 |        | 蘇澳海域 |   | 蘇澳海域 |   | 蘇澳海域 |   |
|-----------|------|--------|------|--------|------|---|------|---|------|---|
| 測站        | X    |        | Y    |        |      |   |      |   |      |   |
| 2014/12 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 1 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 2 月 | 672  | (100%) | 672  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 3 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 4 月 | 720  | (100%) | 720  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 5 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 6 月 | 720  | (100%) | 720  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 7 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 8 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/ 9 月 | 720  | (100%) | 720  | (100%) | *    | * | *    | * | *    | * |
| 2015/10 月 | 744  | (100%) | 744  | (100%) | *    | * | *    | * | *    | * |
| 2015/11 月 | 720  | (100%) | 720  | (100%) | *    | * | *    | * | *    | * |
| 2015/冬季   | *    |        | *    |        | *    | * | *    | * | *    | * |
| 2015/春季   | *    |        | *    |        | *    | * | *    | * | *    | * |
| 2015/夏季   | *    |        | *    |        | *    | * | *    | * | *    | * |
| 2015/秋季   | *    |        | *    |        | *    | * | *    | * | *    | * |
| 2015/整年   | *    |        | *    |        | *    | * | *    | * | *    | * |
| 起始年月      | *    |        | *    |        | *    | * | *    | * | *    | * |
| 結束年月      | *    |        | *    |        | *    | * | *    | * | *    | * |

Cal.X: 港灣技術研究中心潮流 X 站計算資料

# Current Speed in Yi-Lan Seas of SAX0 at 2015

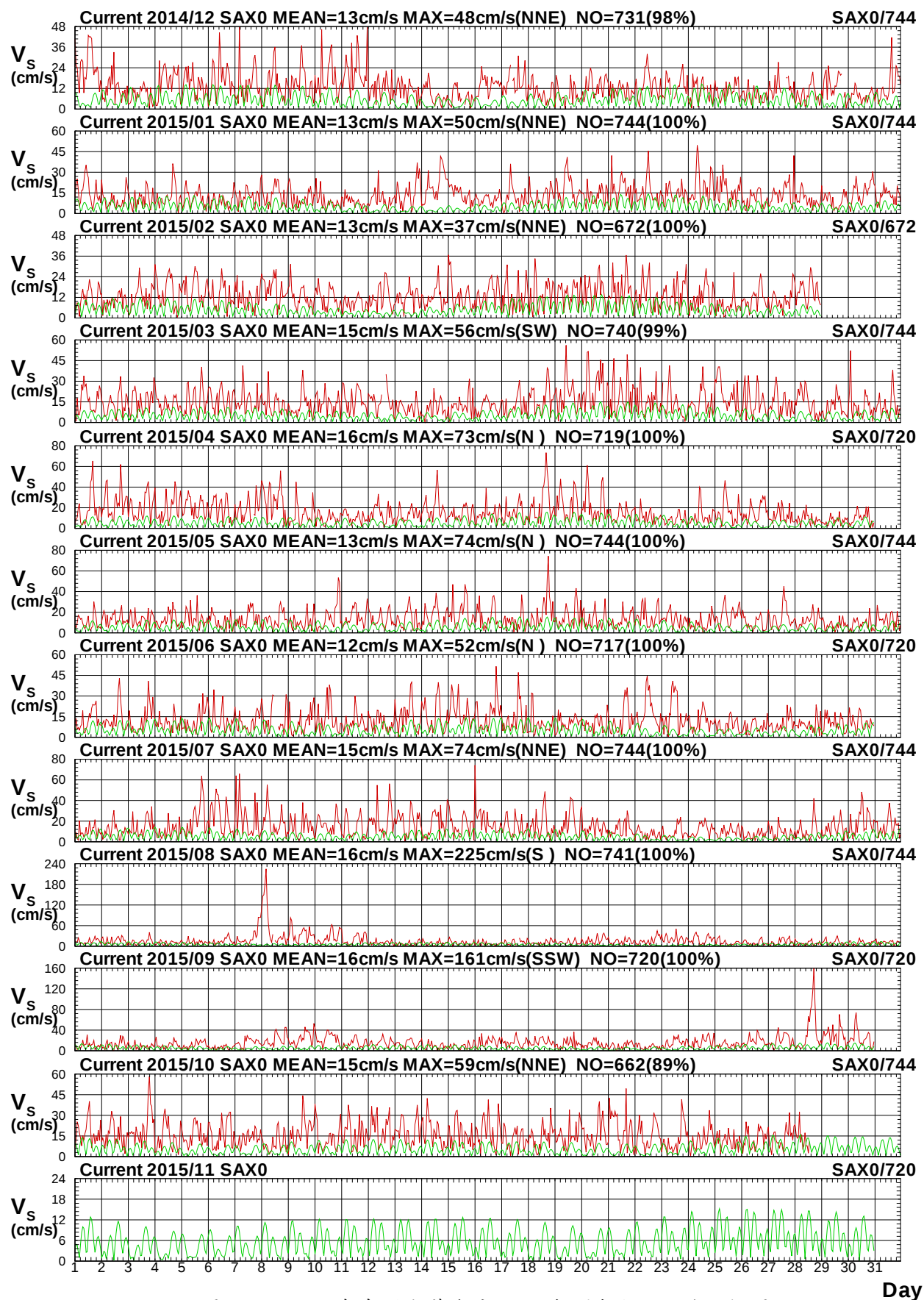


圖 4.1a 2015 年每月宜蘭海域 X 站觀測與潮流流速比較圖

C14CSAX0.1H0 C14CSAX0.1HD C151SAX0.1H0 C151SAX0.1HD C152SAX0.1H0 C152SAX0.1HD  
C153SAX0.1H0 C153SAX0.1HD C154SAX0.1H0 C154SAX0.1HD C155SAX0.1H0 C155SAX0.1HD

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# Current Direction in Yi-Lan Seas of SAX0 at 2015

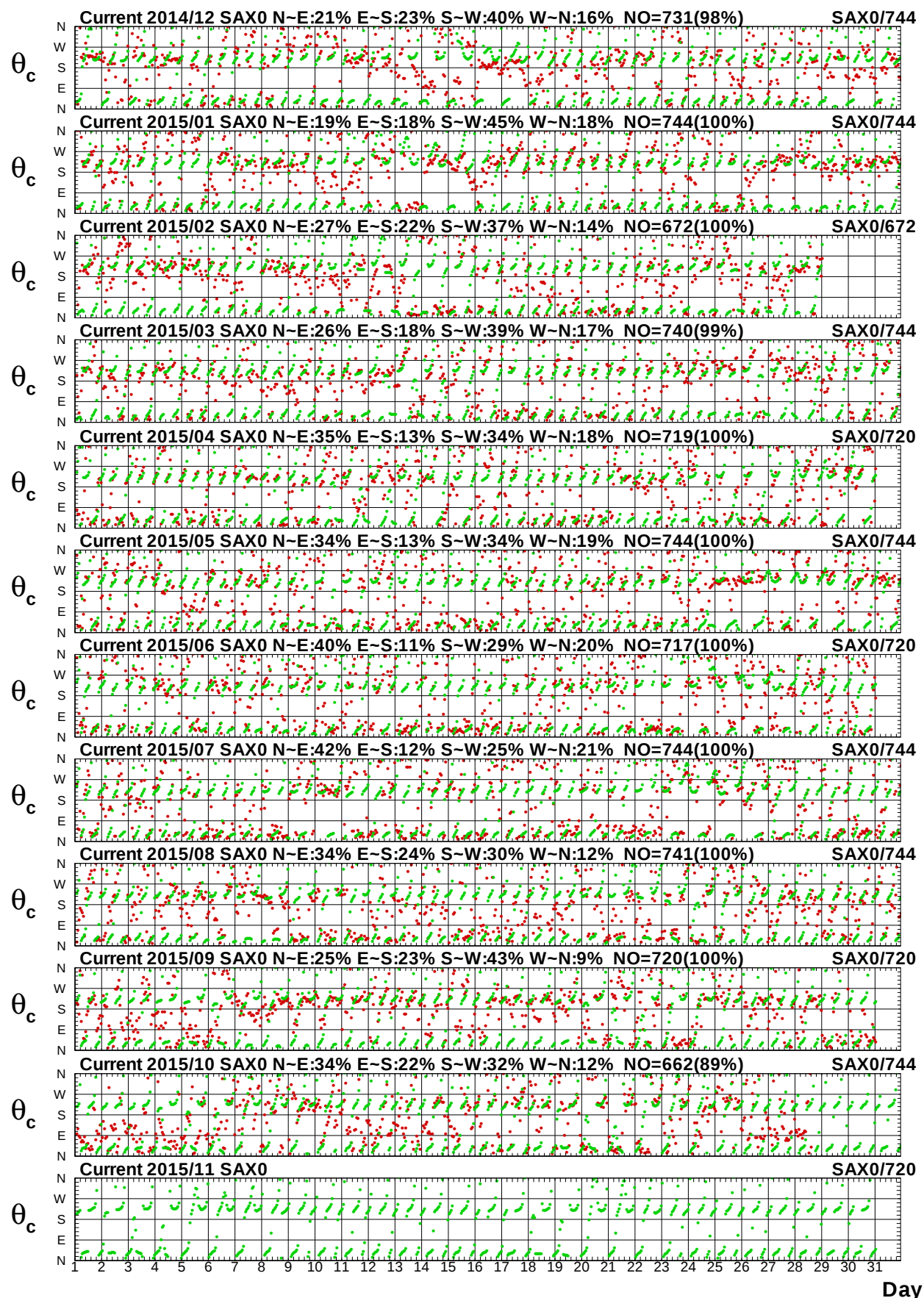


圖 4.1b 2015 年每月宜蘭海域 X 站觀測與潮流流向比較圖

C14CSAX0.1H0 C14CSAX0.1HD C151SAX0.1H0 C151SAX0.1HD C152SAX0.1H0 C152SAX0.1HD  
C153SAX0.1H0 C153SAX0.1HD C154SAX0.1H0 C154SAX0.1HD C155SAX0.1H0 C155SAX0.1HD

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# Current Speed in Yi-Lan Seas of SAX0 at 2015

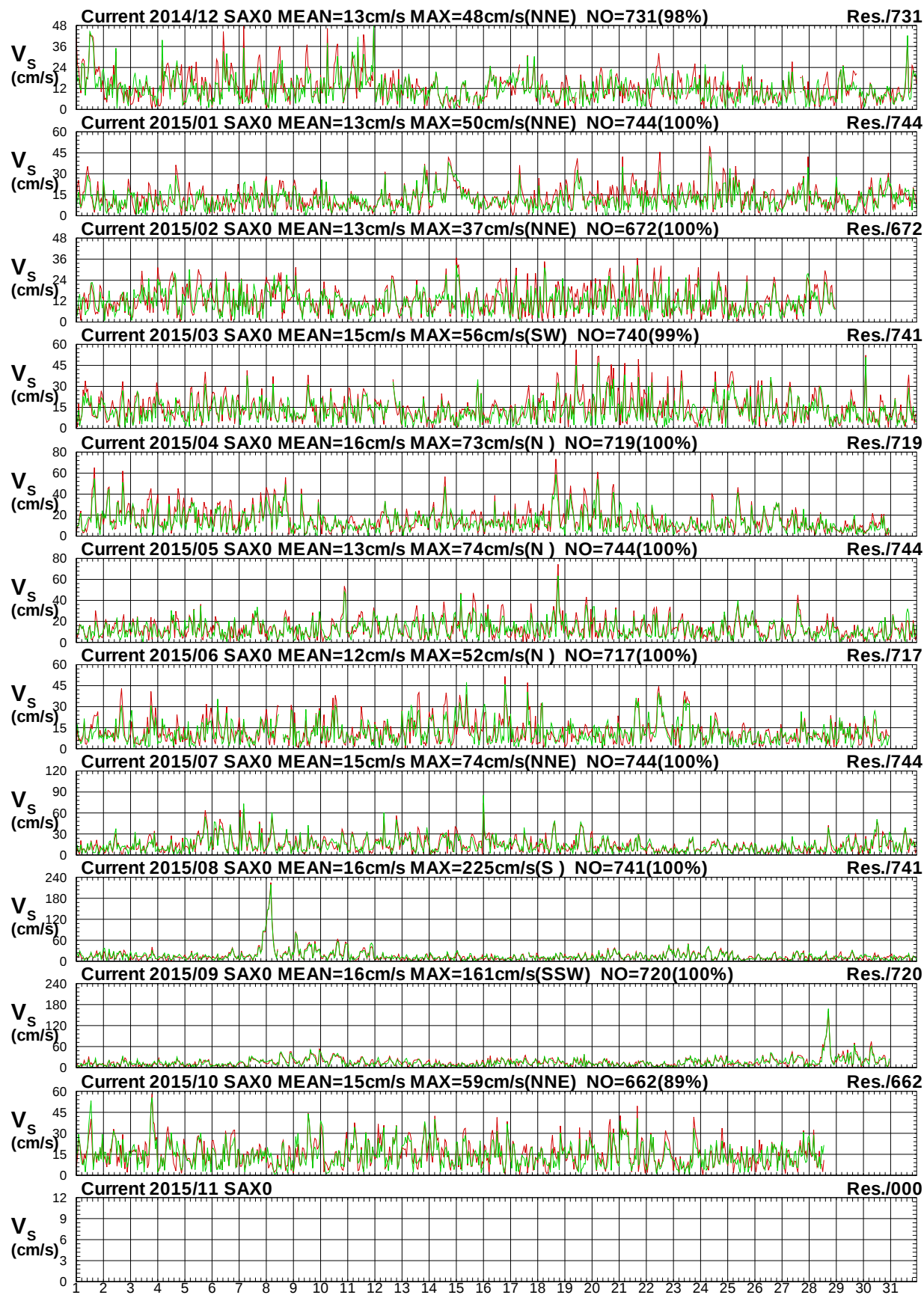


圖 4.2a 2015 年每月宜蘭海域 X 站觀測與非潮流速比較圖

C14CSAX0.1H0 C14CSAX0.1HR C151SAX0.1H0 C151SAX0.1HR C152SAX0.1H0 C152SAX0.1HR  
C153SAX0.1H0 C153SAX0.1HR C154SAX0.1H0 C154SAX0.1HR C155SAX0.1H0 C155SAX0.1HR

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# Current Direction in Yi-Lan Seas of SAX0 at 2015

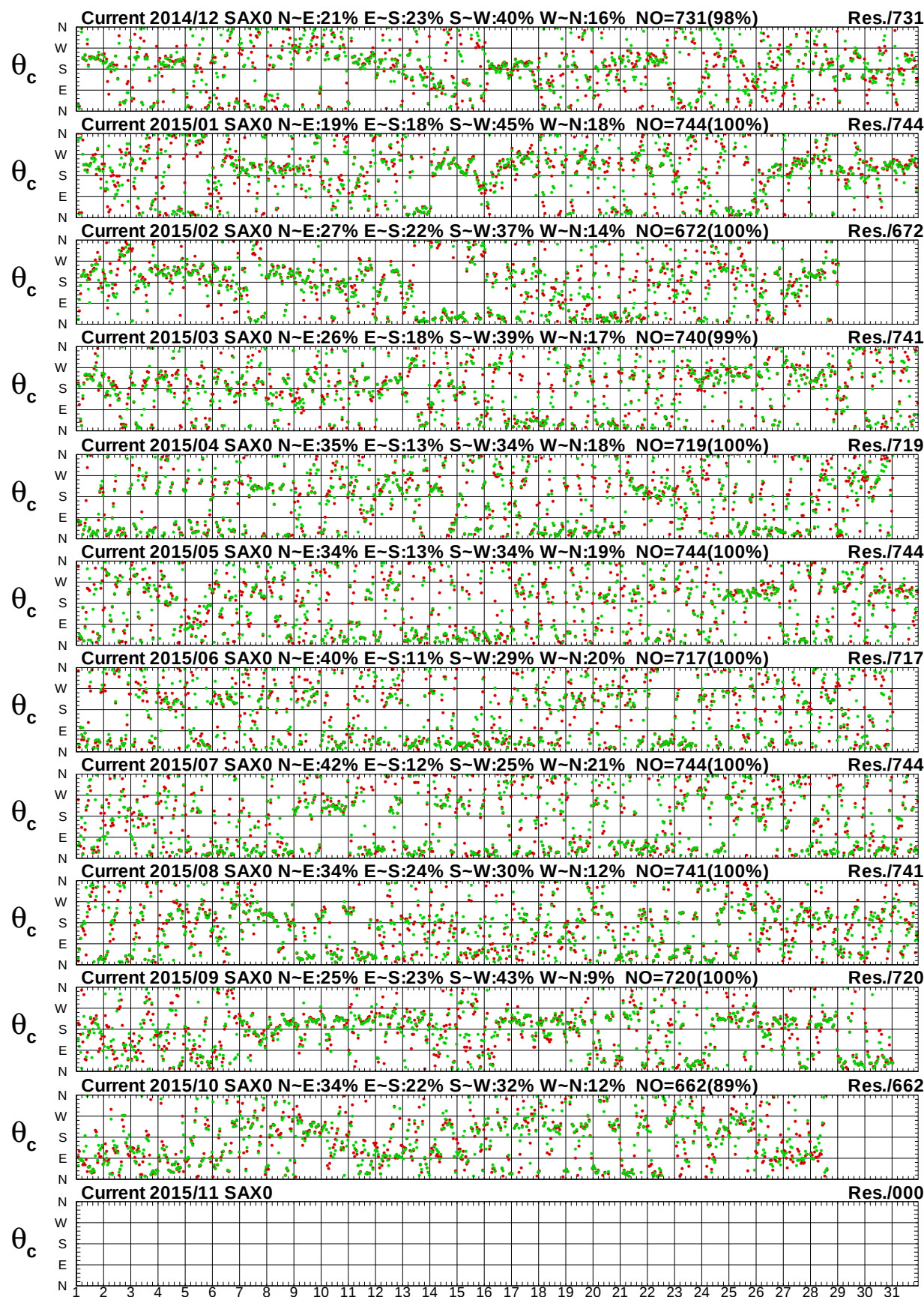


圖 4.2b 2015 年每月宜蘭海域 X 站觀測與非潮流向比較圖

C14CSAX0.1H0 C14CSAX0.1HR C151SAX0.1H0 C151SAX0.1HR C152SAX0.1H0 C152SAX0.1HR  
C153SAX0.1H0 C153SAX0.1HR C154SAX0.1H0 C154SAX0.1HR C155SAX0.1H0 C155SAX0.1HR

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# Current Speed in Yi-Lan Seas of SAY0 at 2015

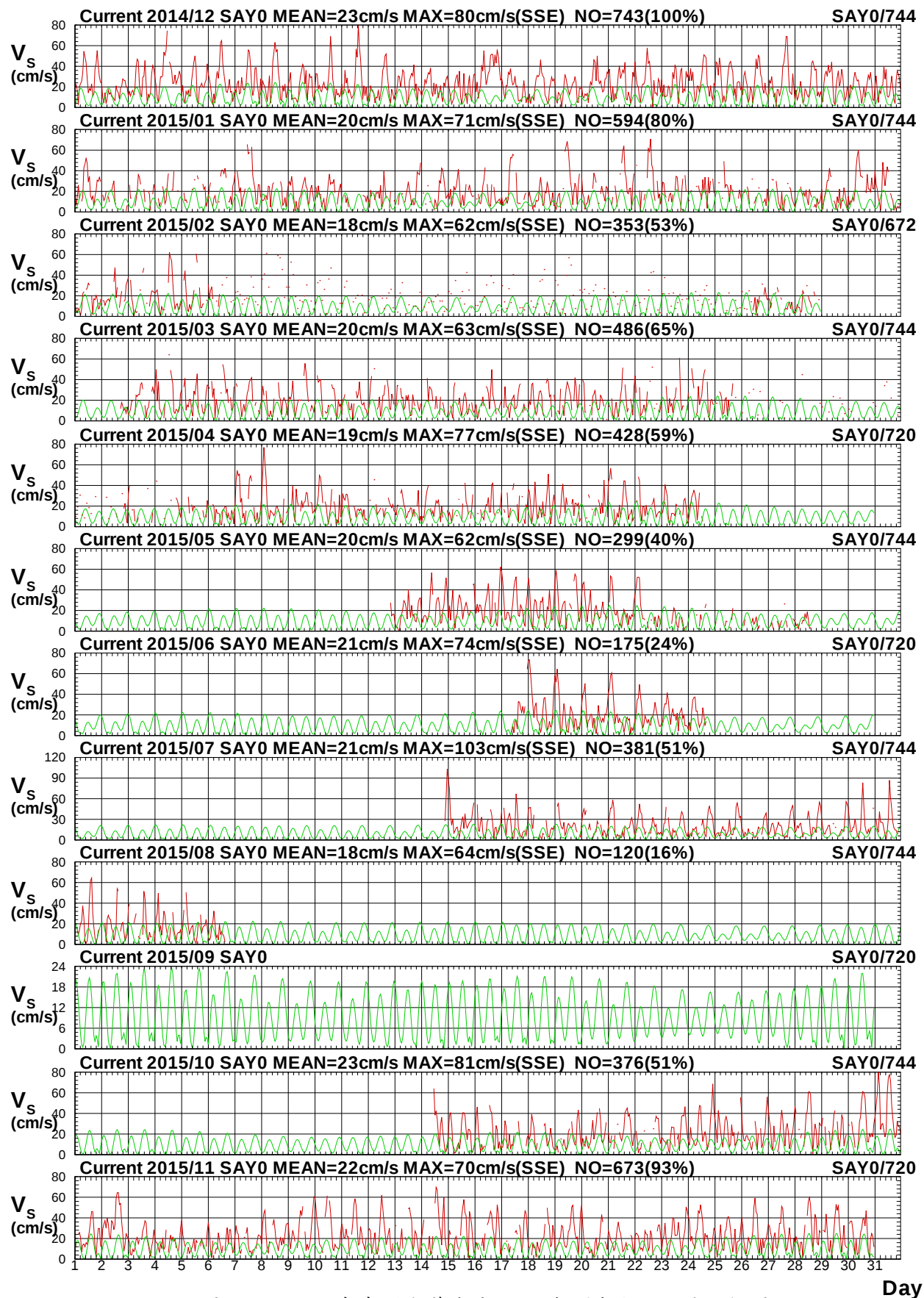


圖 4.3a 2015 年每月宜蘭海域 Y 站觀測與潮流流速比較圖

C14CSAY0.1H0 C14CSAY0.1HD C151SAY0.1H0 C151SAY0.1HD C152SAY0.1H0 C152SAY0.1HD  
C153SAY0.1H0 C153SAY0.1HD C154SAY0.1H0 C154SAY0.1HD C155SAY0.1H0 C155SAY0.1HD

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# Current Direction in Yi-Lan Seas of SAY0 at 2015

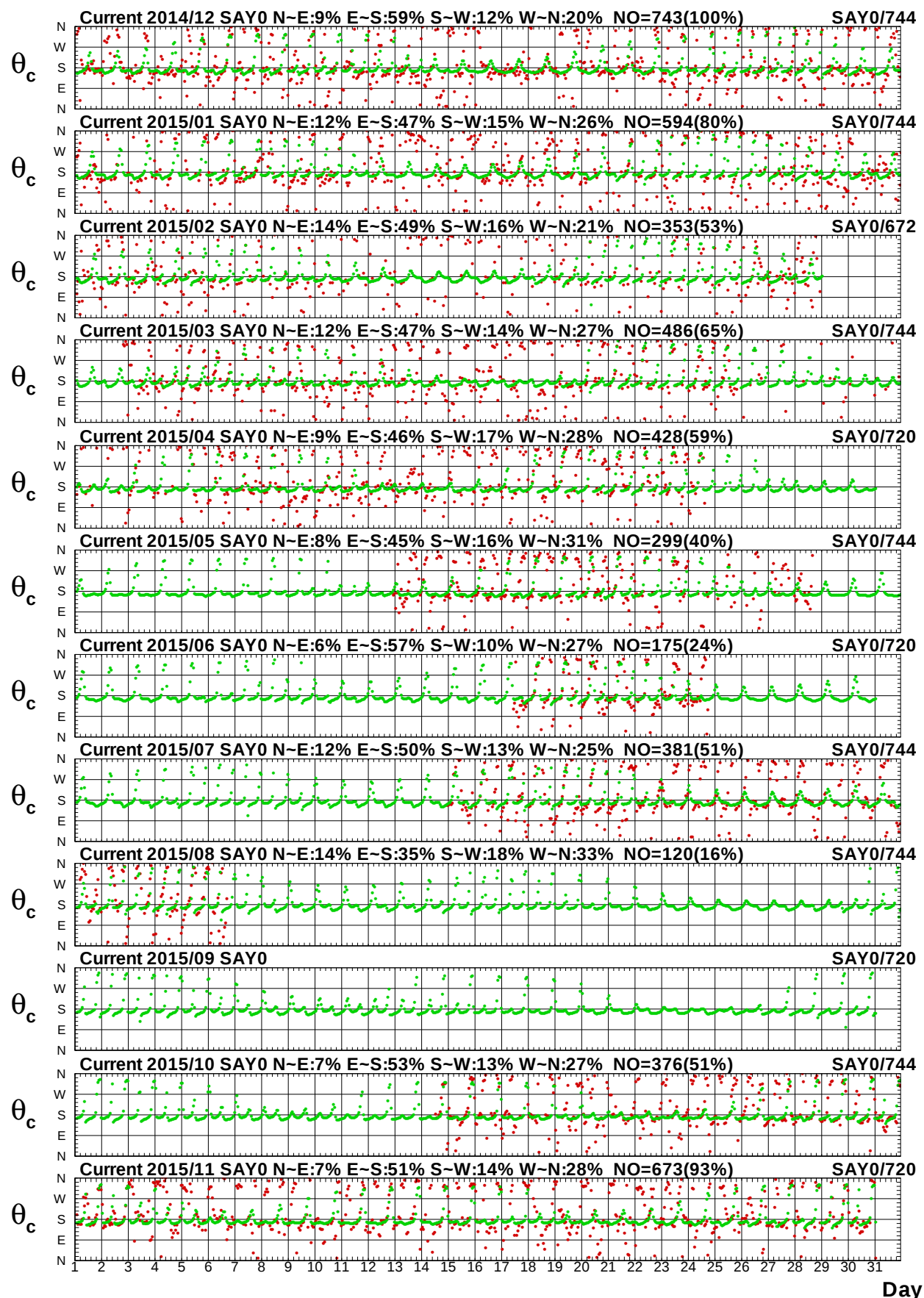


圖 4.3b 2015 年每月宜蘭海域 Y 站觀測與潮流流向比較圖

C14CSAY0.1H0 C14CSAY0.1HD C151SAY0.1H0 C151SAY0.1HD C152SAY0.1H0 C152SAY0.1HD  
C153SAY0.1H0 C153SAY0.1HD C154SAY0.1H0 C154SAY0.1HD C155SAY0.1H0 C155SAY0.1HD

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# Current Speed in Yi-Lan Seas of SAY0 at 2015

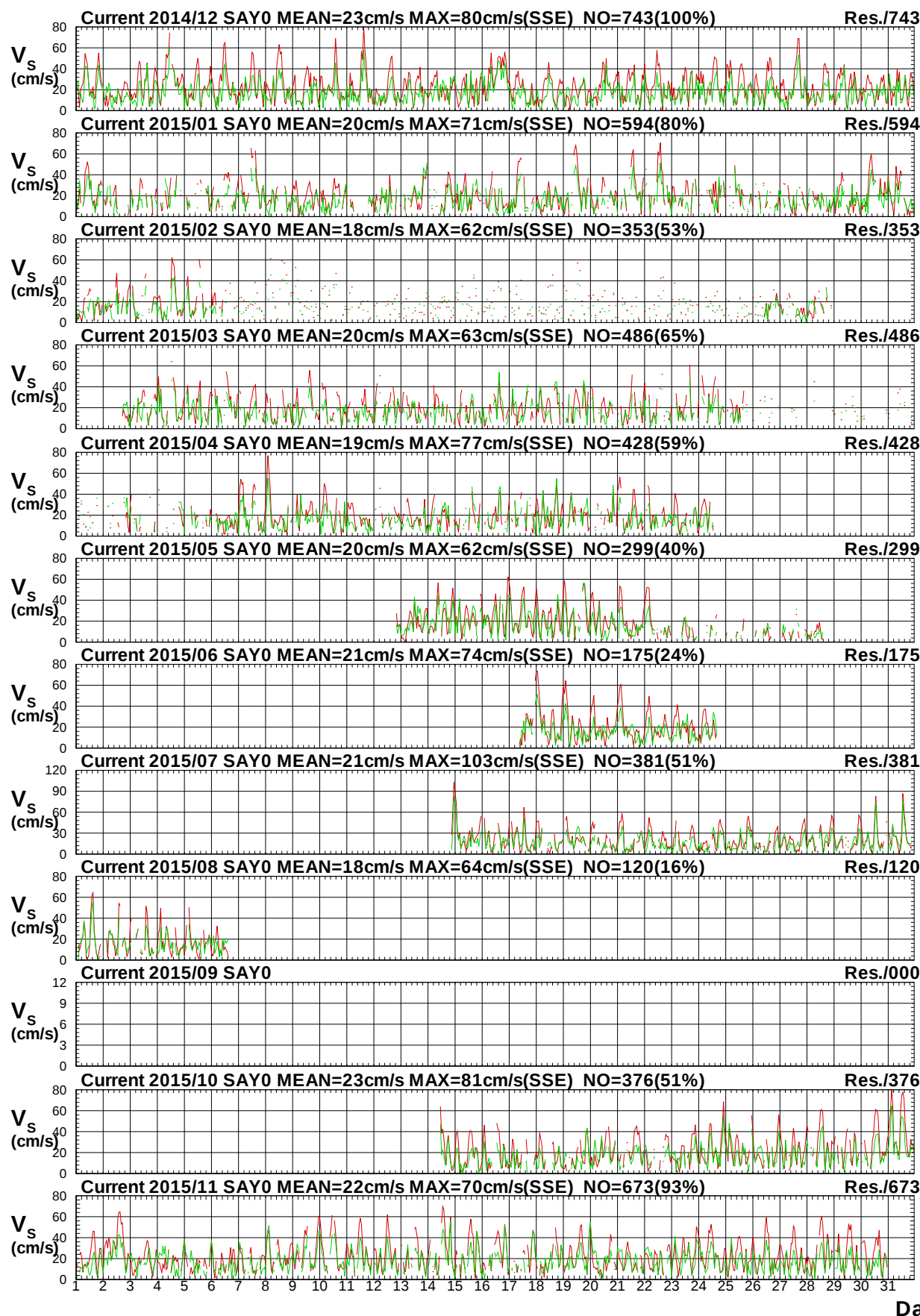


圖 4.4a 2015 年每月宜蘭海域 Y 站觀測與非潮流速比較圖

C14CSAY0.1H0 C14CSAY0.1HR C151SAY0.1H0 C151SAY0.1HR C152SAY0.1H0 C152SAY0.1HR  
C153SAY0.1H0 C153SAY0.1HR C154SAY0.1H0 C154SAY0.1HR C155SAY0.1H0 C155SAY0.1HR

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# Current Direction in Yi-Lan Seas of SAY0 at 2015

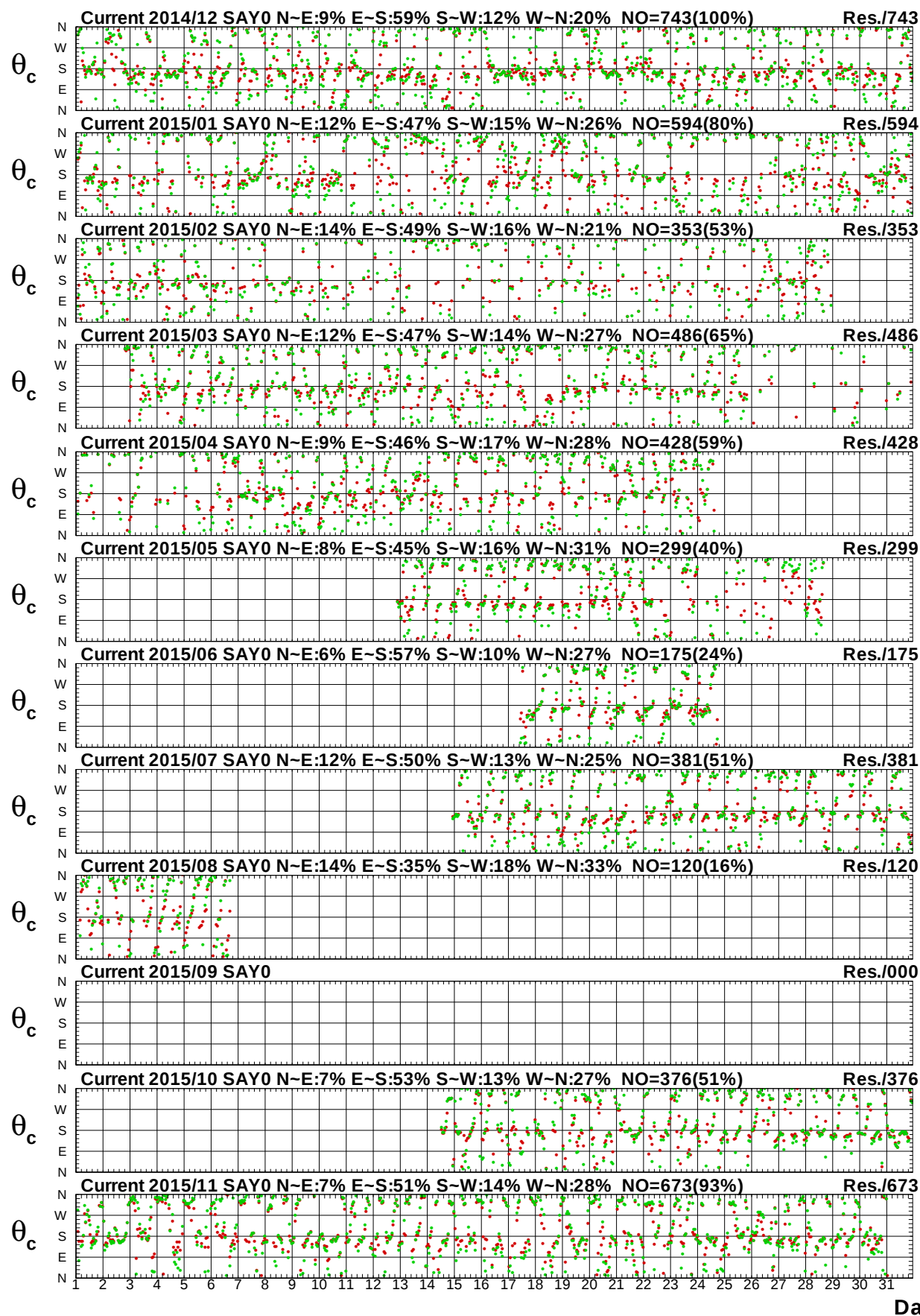


圖 4.4b 2015 年每月宜蘭海域 Y 站觀測與非潮流向比較圖

C14CSAY0.1H0 C14CSAY0.1HR C151SAY0.1H0 C151SAY0.1HR C152SAY0.1H0 C152SAY0.1HR  
C153SAY0.1H0 C153SAY0.1HR C154SAY0.1H0 C154SAY0.1HR C155SAY0.1H0 C155SAY0.1HR

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# Current Speed in Yi-Lan Seas of SAX0 at 2015

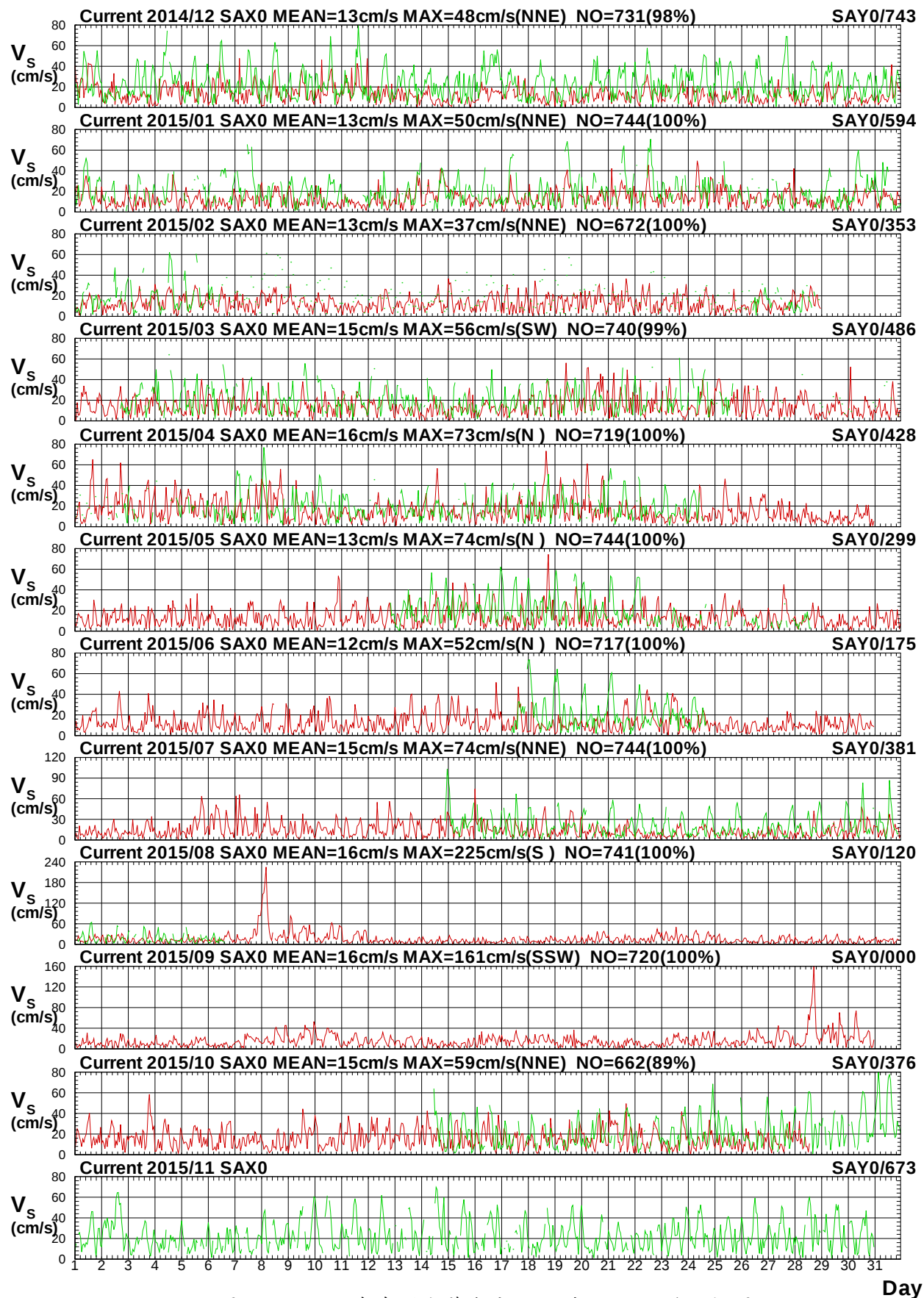


圖 4.5a 2015年每月宜蘭海域 X 站與 Y 站流速比較圖

C14CSAX0.1H0 C14CSAY0.1H0 C151SAX0.1H0 C151SAY0.1H0 C152SAX0.1H0 C152SAY0.1H0  
C153SAX0.1H0 C153SAY0.1H0 C154SAX0.1H0 C154SAY0.1H0 C155SAX0.1H0 C155SAY0.1H0

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# Current Direction in Yi-Lan Seas of SAX0 at 2015

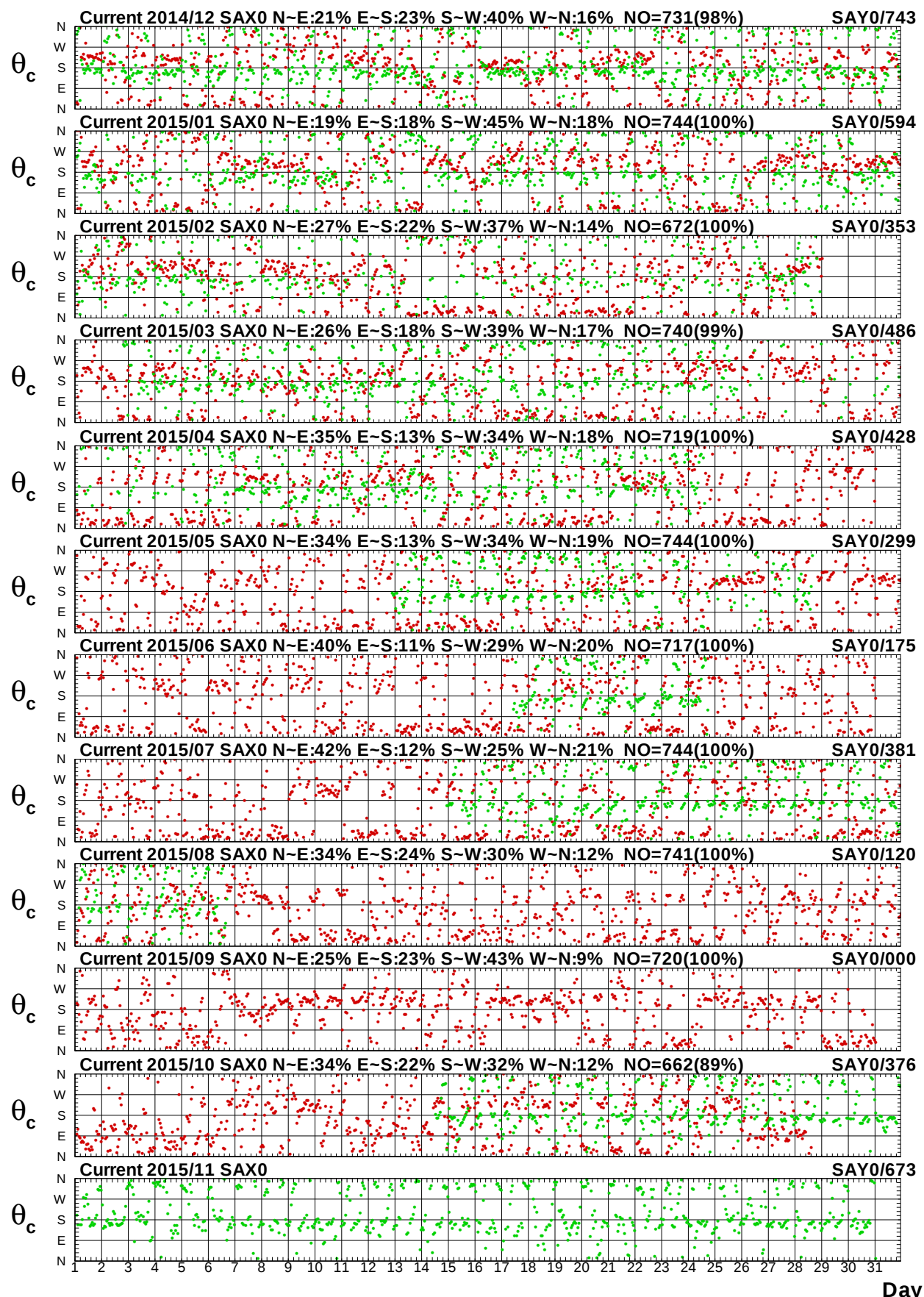


圖 4.5b 2015年每月宜蘭海域 X 站與 Y 站流向比較圖

C14CSAX0.1H0 C14CSAY0.1H0 C151SAX0.1H0 C151SAY0.1H0 C152SAX0.1H0 C152SAY0.1H0  
C153SAX0.1H0 C153SAY0.1H0 C154SAX0.1H0 C154SAY0.1H0 C155SAX0.1H0 C155SAY0.1H0

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