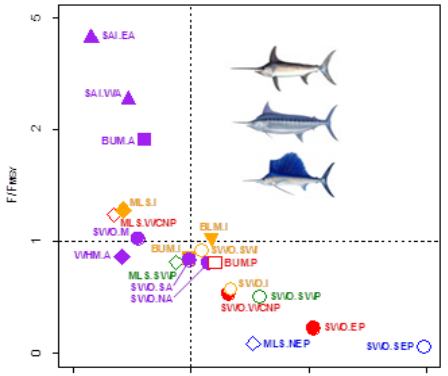
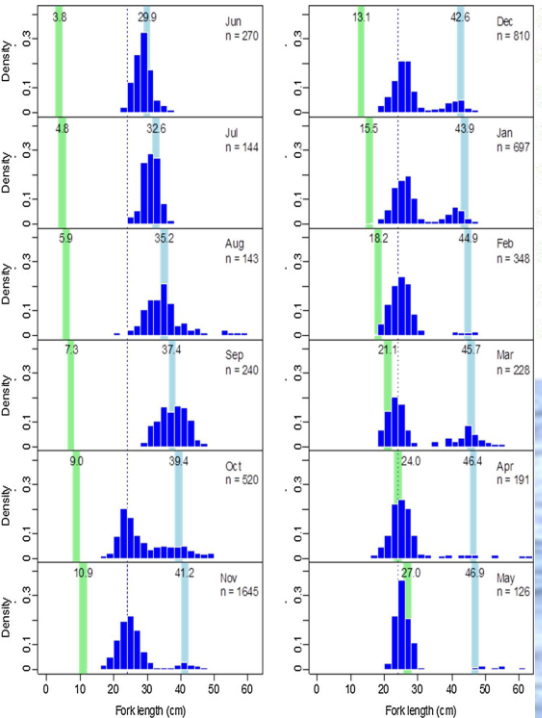
# 環境與漁業資源研究室

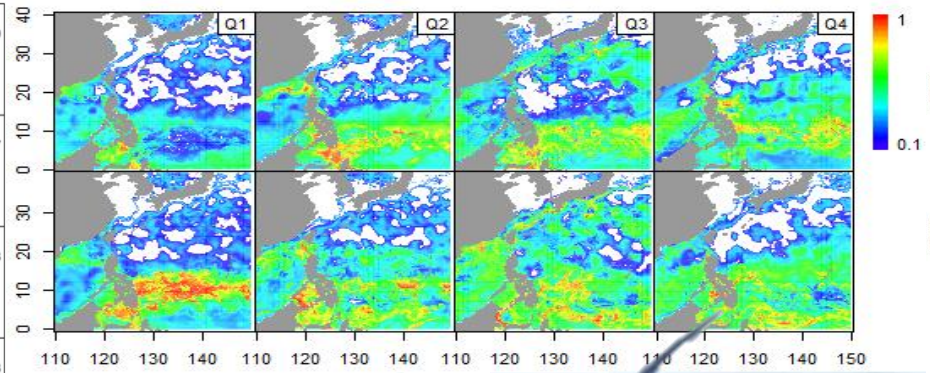
## 研究方向

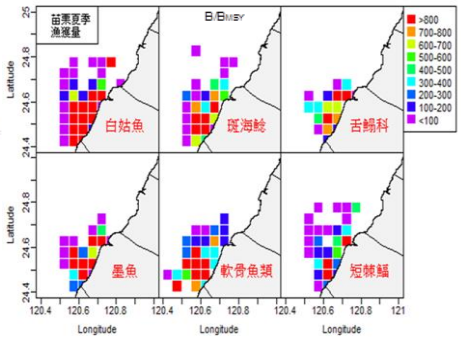
蘇楠傑 助理教授

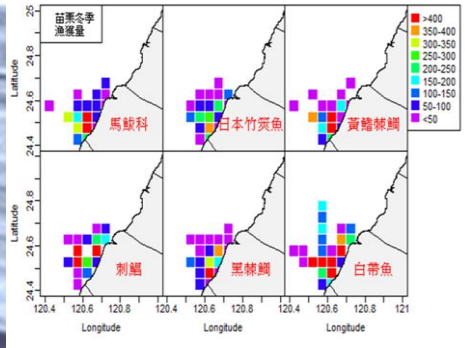
- 探討族群動態與海洋生態環境變動之關係，包括資源評估與漁業管理策略模擬，以提供保育科學建議基礎，研究目標為大洋洄游性魚種與沿近海重要經濟漁業資源，並以此發展海域空間規劃及相關漁業政策制定。



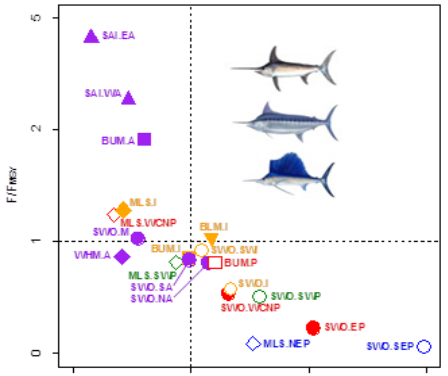
Department of Environmental Biology and Fisheries Science
National Taiwan Ocean University

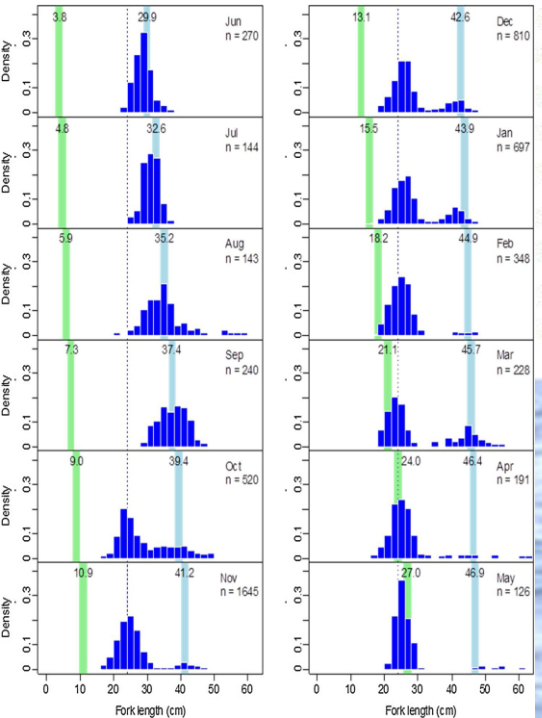
# Lab for Environment and Fishery Resources

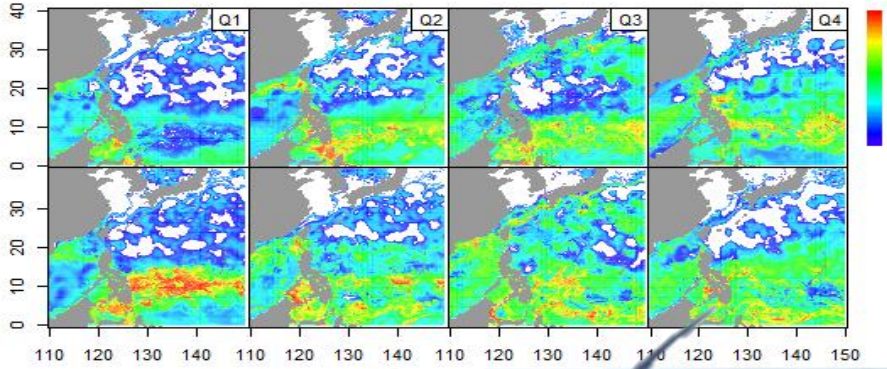
## Research Interest

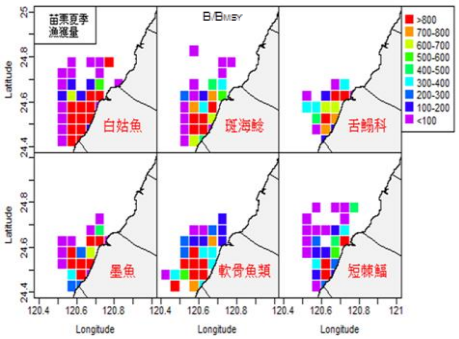
PI: Dr. Nan-Jay Su

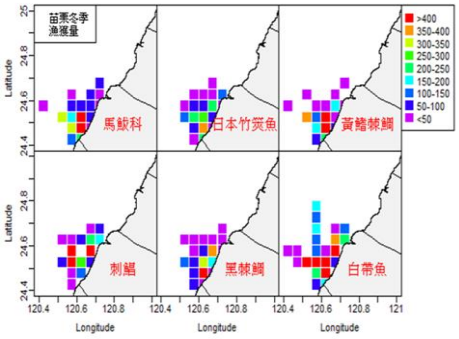
- Population dynamics and the relationships to the variation of oceanographic variables and marine environment. Stock assessment and fisheries management strategy evaluation, as the basis to provide scientific advices on conservation. We study fishery resources in pelagic waters and coastal areas and use the results marine spatial planning and policy making.



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*remote sensing*

MDPI

*Article*

# Modeling the Spatial Distribution of Swordfish (*Xiphias gladius*) Using Fishery and Remote Sensing Data: Approach and Resolution

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## 利用漁業與遙測資料建構劍旗魚空間分布

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2. 國立臺灣海洋大學海洋中心
3. 水產試驗所海洋漁業組

## 重要研究成果

- 旗魚是具有重要經濟性魚種，廣泛分布於三大洋中，其有喜好的棲息環境海域並且垂直回游至表面覓食。然而，由於劍旗魚分布較廣，因此在太平洋海域較少研究劍旗魚的空間分布模式及喜好的棲息地。
- 本研究利用兩種方法：GAM和HSI模式去驗證在不同的時空資料尺度下，劍旗魚空間分布和其喜愛的環境因子。
- 結果指出海表溫度為決定劍旗魚空間分布的主要因子。透過不同模式評估，棲地空間分布和其喜好環境範圍與時空資料尺度具有高度相關。其結果顯示劍旗魚預測值在中太平洋熱帶水域有較高的密度，並沒有明顯的季節

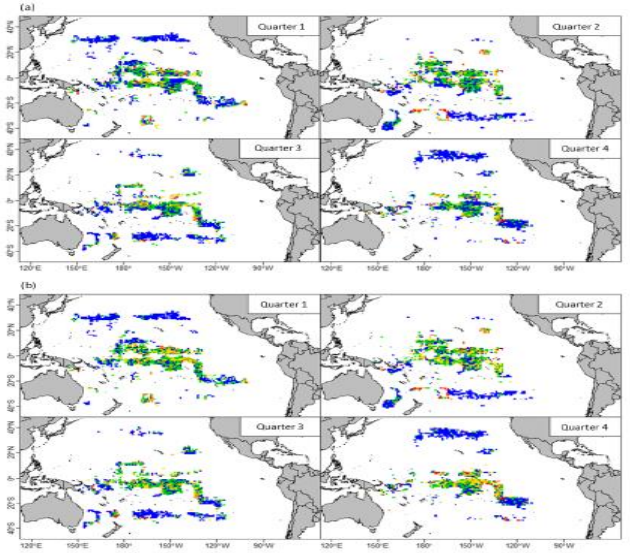


**Figure 9.** Distributions indicating differences by level between the nominal observations and predicted values using (a) the final GAM with variables listed in Table 1 and (b) HSI models with variables listed in Table 2 based on fishery and remote sensing data aggregated at the weekly 1° × 1° resolution. Small differences are marked as blue and green points, and large differences are marked as yellow, orange and red points.

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Age determination for juvenile fourfinger threadfin (*Eleutheronema rhadinum*) by using otolith microstructure and length data obtained from commercial fisheries off northwestern Taiwan

Nan-Jay Su[a,b,*], Yi-Sin Lu[a], Chia-Hui Wang[a,b], Cheng-Hsin Liao[a,b], Wei-Chuang Chiang[c], Chen-Te Tseng[c]

[a] Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University, 20224 Taiwan
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# 利用耳石微結構和體長資料判定台灣西北沿近海域經濟性捕獲多鱗四指馬鮫幼魚年齡

蘇楠傑[a,b*]、呂繹昕[a]、王佳惠[a,b]、廖正信[a,b]、江偉全[c]、曾振德[c]

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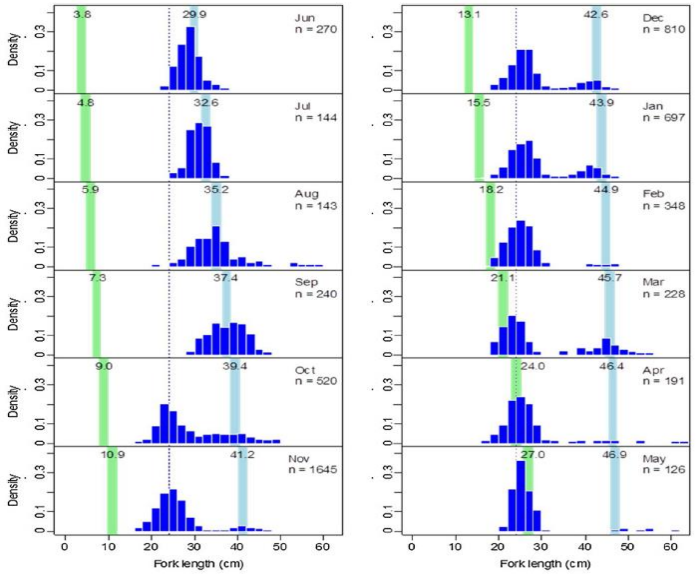
c. 水產試驗所海洋漁業組

## 重要研究成果

- 多鱗四指馬鮫為沿近海小型漁業中具有經濟價值魚種，但很少研究去了解其生活史，包含年齡與成長。在此篇研究中主要利用耳石微結構分析去研究其早期生活史時耳石的日周輪，並且利用其他資訊與方法證實其年齡估計。
- 日周輪的形成是具有規律性且有間距，而成長174-652天的魚樣本成功被定齡，而個體間的成長率也相對穩定。套適成長方程式，多鱗四指馬鮫一歲時的尾叉長估計為29.7公分，利用日周輪和捕獲日期回推產卵期為四月到八月。爾後我們利用每月體長頻度資料的峰值驗證其年齡估計。結果顯示，利用最佳套適的成長方程式預測數值與體長資料的峰值是完全吻合。在本研究中顯示，在



RESEARCH ARTICLE

# A Two-stage Approach to Integrate Vessel Geo-tracking Data and Logbooks for Monitoring Fishing Activity of Coastal Fisheries in Waters Off Northwestern Taiwan

Yi-Jou Lee [a], Nan-Jay Su [a,b,*], Cheng-Hsin Liao [a,b], Wei-Chuan Chiang [c], Chun-Huei Li [d]

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# 以兩階段方法整合船舶軌跡資料和作業日誌作為沿近海漁業活動監控指標

李依柔[1]、蘇楠傑[1,2*]、廖正信[1,2]、江偉全[3]、李純慧[3]

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c. 水產試驗所海洋漁業組

## 重要研究成果

- 漁獲量與努力量是資源評估和漁業管理上最基礎的資料，然而由於沒有行政部門支持與健全漁業資料蒐集系統而難以獲得。本研究以簡單的船舶地理軌跡系統和沿近海刺網漁民的作業日誌進行整合。我們發展以階層式集群分析法為基礎的兩階段方法去分辨作業狀態並且判斷漁業上的漁業行為。結果顯示可針對各種不同作業漁船大小且結合其作業日誌中的漁獲組成及漁獲資訊可準確的估計其作業努力量也就是持續作業時間，因此我們呈現了利用漁船大小和漁期間監測其在地理位置上的漁獲努力量和漁業強度。本研究所發展的方法有利於了解漁船動態以及捕撈型態，從而克服由於在不同季節上目標魚種的轉換和各種捕撈策略的複雜度而導致的漁業管理困難。

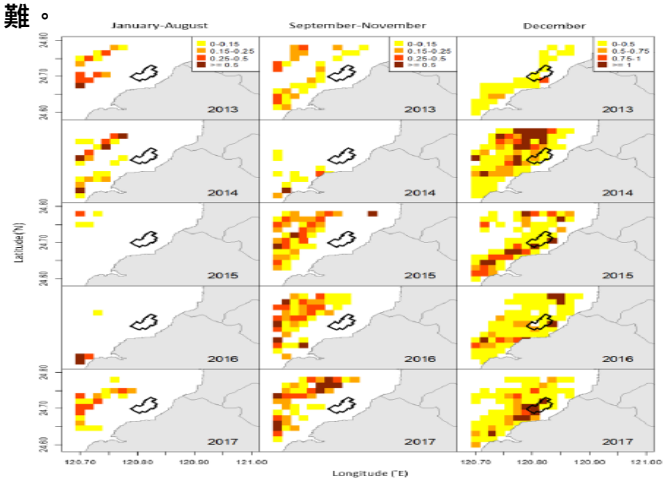


Fig. 6. Spatial distributions of fishing effort by fishing season (left to right) for vessels between 20-100 GRT of a small-scale gillnet fishery in coastal and inshore waters off northwestern Taiwan. The area of offshore wind farm is shown in the maps.