澎湖世界遺產潛力點
海洋文化永續發展
國際學術交流研討會

會議手冊

澎湖世界遺產潛力點海洋文化永續發展國際學術交流研討會

International Conference on the Sustainable Development of Marine Culture at the Penghu World Heritage Potential Site

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澎湖世界遺產潛力點海洋文化永續發展國際學術交流研討會議程

International Conference on the Sustainable Development of Marine Culture at the Penghu World Heritage Potential Site

Agenda

International Conference on the Sustainable Development of Marine Culture at the Penghu World Heritage Potential Site

Agenda

Date：31 October to 1 November, 2025
Venue : ShaunWu Conference Hall (1st Floor), Discovery Hotel, Penghu

Time	Oct.31, 2025 (Friday)	
08:30~09:00	Registration of Participants	
09:00~09:20	Opening Ceremony Welcome Remarks	Master of Ceremonies: Rui-Wen Hsu
09:20~12:20	Keynote Speeches (I), (II), (III) and (IV) With a Focus on World Heritage Culture	
09:20~10:00	Keynote Speech (I) **Title: Traditional Pacific Islander Connections with the Coast and Sea in Oceania** Bill Jeffery Associate Professor, Anthropology University of Guam	**Moderator:** Shyang-Chyuan Fang Dean, College of Tourism and Leisure, National Penghu University of Science and Technology
10:00~10:40	Keynote Speech (II) **Title: Genealogy of the Research of Stone Tidal Weirs in Taiwan:The Perspective of a Japanese Geographer of Fisheries** Masataka TAWA Emeritus Professor of Geography, Kwansei Gakuin University	
10:40~11:00	Coffee Break	
11:00~11:40	Keynote Speech (III) **Title: Natural and Human Cultural Evolution of Chimei Island, Penghu** Sheng-Rong Song Professor, Department of Geosciences, National Taiwan University	**Moderator :** Chun-Chieh Hu Professor, Department of Marine Recreation, National Penghu University of Science and Technology
11:40~12:20	Keynote Speech (IV) **Title:Underwater Cultural Heritage (UCH) in Asia Addressing Challenges and Charting Future Pathways** Keat Gin Ooi Professor, Academy of Brunei Studies, University Brunei Darussalam	
12:20~13:20	Lunch Break	
13:20~16:00	Keynote Speeches (V), (VI), (VII) and (VIII) With a Focus on Marine Culture	

Time	Oct.31, 2025 (Friday)	
13:20~14:00	Keynote Speech (V) **Title: Sustainable Use and Management of Marine and Coastal Cultural Resources** Asami SHIKIDA Research Institute of Regional and Urban Planning (RIRUP) Emeritus Professor of Japan Advanced Institute of Science and Technology(JAIST)	**Moderator :** Shyi-Liang Yu Professor, Department of Tourism and Leisure, National Penghu University of Science and Technology
14:00~14:40	Keynote Speech (VI) **Title: David Marr Henderson the Man Behind the Lights-The Story of an Exceptional Lighthouse Engineer** Felicity Somers Eve Great-granddaughter of Lighthouse Engineer David Marr Henderson	
14:40~15:20	Keynote Speech (VII) **Title: David Marr Henderson: Surveying Xiyu Pagoda Lighthouse and Designing Fisher Island Lighthouse** Steve H. Ching Former University Librarian & Special Advisor (Preserving and Appraising Traditional Cultural Heritage), City University of Hong Kong Founder of Lighthouse Heritage Research Connections	
15:20~16:00	Keynote Speech (VIII) **Title: Examining the Construction of Stone Weirs from The Perspective of "Sweat-Equity" – Conservation and Reuse Alternatives with Active Labor Involving** Chi-Jeng Kuo Professor, Dept. of Architecture, Tunghai University	
16:00~16:20	Coffee Break	
16:20~18:00	With a Focus on Marine Cultural Heritage	
16:20~16:40	**Title: Linking Penghu's Underwater Cultural Heritage and Tourism Industry** Chi-Lin Lee Professor and Chair, Department of History, Tamkang University	**Moderator:** Chi-Jeng Kuo Professor, Department. of Architecture, Tunghai University **Discussant:** Yen- Chen Huang Associate Professor, Department of Marine Recreation, University of Science and Technology
16:40~17:00	**Title: Wind, Waves, and Knowledge: The Adaptive Design and Structural Evolution of the Jibei Stone Fish Weir** Chao-Yuan Chen and Ming-Ju Lee Assistant Professor, Chia Nan University of Pharmacy and Science Professor, National Penghu University of Science and Technology	
17:00~17:20	**Title: Discussion on Shihu Cultural Inheritance and Sustainable Value - Take the Oyster Shihu Group in Xinwu District, Taoyuan City as an Example**	

Time	Oct.31, 2025 (Friday)	
	Susan Hsu Director, Taoyuan Stone Tidal Weirs Association	
17:20~17:40	**Title: Review of Stone Weir Preservation Documentation Methods and the Potential of Digital Preservation Technologies** Cho-Cheng Li and Kai-Ti Huang CEO, S. Architects Union, Assistant Professor Rank Specialist, Department of Communications Design, Shih Chien University	
17:40~18:00	**Title: The Kingdom of Stone Axes– Qimei Island as an Island Museum** Mei-Hua Shao Independent Researcher	
18:00~18:20	Panel Discussion	
18:30	Dinner	

Time	Nov. 1, 2025 (Saturday)	
08:00~08:30	Registration of Participants	
08:30~10:30	Keynote Speeches (IX), (X) and (XI) With a Focus on Underwater Cultural Heritage	**Moderator/ Panelist**
08:30~09:10	Keynote Speeches (IX) **Title: Photosynthesis Research for Climate Action - To Sustain Earth's Environment, Including Coral Reef Ecosystems** Hisako Kubota Kawai Associate Professor, Yamagata University	**Moderator:** Ming-Huei Wang Professor, General Education Center, National Penghu University of Science and Technology
09:10~09:50	Keynote Speeches (X) **Title: Whales/Dolphins in Taiwan's History: A Journey from Catching to Watching and Conservation** Chung-Ling Chen President, National Academy of Marine Research Professor, National Cheng Kung University	
09:50~10:30	Keynote Speeches (XI) **Title: Resilience Assessment of the Xinwu Stone Tidal Weirs and Its Surrounding Settlements** Chin-Hung Chou Professor, Department of Hakka Language and Social Sciences, National Central University	
10:30~10:40	Coffee Break	
10:40~11:40	With a Focus on Marine Cultural Heritage	

Time	Nov. 1, 2025 (Saturday)	
10:40~11:00	**Title: Existential Authenticity in a World Heritage Potential Site: A Cultural Tourism Study of Erkan Settlement, Penghu** Zhong-Jie Chen Master, City University of Macau	**Moderator:** Steve H. Ching Former University Librarian & Special advisor, City University of Hong Kong Founder of Lighthouse Heritage Research Connections **Discussant:** Ming-Chuan Han Associate Professor Department of Tourism, Shih Hsin University
11:00~11:20	**Title: The Research on the Marine Writing Characteristics of Flowers in the Mirror** Huining Zhong and Peijia Shen Master, City University of Macau/ Institute for Research on Portuguese-speaking countries Bachelor of Arts, Nanfang College, Guangzhou	
11:20~11:40	**Title: The Newly Obtained Documentary Records of Han Deshan's Ascension of the Old Xiyu Tower Lamp, and The Differences between The New and Old Records Are Compared** Ing-Shing Shie Former Librarian of Tunghai University (Special Collection) Subject Specialist (Ancient Chinese Texts), Lighthouse Heritage Research	
11:40~12:40	With a Focus on Sustainable Development of Marine Culture	
11:40~12:00	**Title: Molecular Basis of Efficient Electron Transfer Reactions Mediated by Unique Enzymes in Marine Cyanobacteria-Towards Efficient CO_2 Assimilation and Climate Change Mitigation** Rion Irokawa, Fumihiro Kawai and Hisako Kubota Kawai Graduate Student, Postdoctoral Fellow and Associate Professor, Yamagata University Graduate student, Postdoctoral Fellow andAssociate Professor, Yamagata University	**Moderator:** Chung-Ling Chen President, National Academy of Marine Research **Discussant:** I-Chen Hsueh Associate Professor, Department of Ecology and Environmental Resources, National Tainan University
12:00~12:20	**Title: The Application of Ethnobotanical Knowledge in Traditional Fishing Practices of Penghu, Taiwan** Hsiao-Chen Wang CEO, Foundation of Pescadores Citizens	
12:20~12:40	**Title: Translating Marine Culture through Fish Education: The Case of "Fish Says" in Penghu** Chia-Jung Wu Founder of Fish Says	
12:40	Closing Ceremony	
12:40-14:00	Lunch	
14:00	Farewell	

2025.11.1 Visit to World Heritage Potential Site -Stone Weir Trip

Time	Nov. 1, 2025 (Saturday)	Moderator
13:00~13:30	Leave for Hongluo Village	Fu-Tzu Yang Founder of Isle.Travel
13:30~15:00	Hongluo Stone Weir	
15:00~15:20	Leave for Guoye Village	
15:20~16:00	Guoye Stone Weir	
16:00~16:20	Leave for Aimen Village	
16:20~16:40	Aimen Stone Weir	
16:40	Farewell	

澎湖世界遺產潛力點海洋文化永續發展國際學術交流研討會議程

時間：2025.10.31-2025.11.1
地點：澎澄飯店玄武會議廳(880 澎湖縣馬公市同和路 168 號)

Time	Oct.31, 2025 (Friday)	
08:30~09:00	報到	
09:00~09:20	開幕 貴賓致詞	司儀： 許睿雯
09:20~12:20	專題講座(一) (二) (三) (四) 世界遺產	
09:20~10:00	專題講座(一) 題目：傳統太平洋島民與大洋洲海岸文化及海洋之關係 Bill Jeffery 美國關島大學副教授	主持人： 方祥權 國立澎湖科技大學 觀光休閒系教授兼 院長
10:00~10:40	專題講座(二) 題目：台灣石滬研究的發展脈絡-從日本漁業地理學者的視角探析 田和正孝 日本關西學院大學名譽教授	
10:40~11:00	茶敘時間	
11:00~11:40	專題講座(三) 題目：澎湖七美島的自然和人文演變 宋聖榮 國立臺灣大學地質科學系教授	主持人： 胡俊傑 國立澎湖科技大學 海洋遊憩系教授
11:40~12:20	專題講座(四) 題目：亞洲水下文化遺產：因應挑戰與擘劃未來發展途徑 Ooi Keat Gin 汶萊達魯薩蘭國大學汶萊研究院教授、倫敦皇家歷史學會院士	
12:20~13:20	午餐(澄澄餐廳)	
13:20~16:00	專題講座(五)(六)(七)(八) 海洋文化	
13:20~14:00	專題講座(五) 題目：海洋與沿岸文化資源的可持續利用與管理 敷田麻実 一般財團法人地域振興研究所主任研究員 北陸先端科學技術大學院大學名譽教授	主持人： 于錫亮 國立澎湖科技大學 觀光休閒系教授
14:00~14:40	專題講座(六) 題目：燈塔之光背後的人--卓越燈塔工程師大衛・馬爾・韓德善的故事 費莉希蒂・索默斯・伊芙	

Time	Oct.31, 2025 (Friday)	
	燈塔工程師大衛·馬爾·韓德善的曾孫女	
14:40~15:20	專題講座(七) 題目：韓德善與西嶼塔燈履勘及漁翁島燈塔設計的貢獻 — 側論其結合文化遺產保護和文旅發展的策略 景祥祜 曾任香港城市大學圖書館館長、特別顧問（傳統文化遺產保護與傳承） 燈塔古蹟保育研習實踐研究群創始人	
15:20~16:00	專題講座(八) 題目：從「勞動股權」概念檢視石滬營造-勞動力主動介入的保存再利用替選方案 郭奇正 東海大學建築學系教授	
16:00~16:20	茶敘時間	
16:20~18:00	主題：海洋文化遺產	
16:20~16:40	題目：澎湖水下文化資產與觀光產業的鏈接 李其霖 淡江大學歷史系教授兼系主任	主持人： 郭奇正 東海大學建築學系 教授 評論人： 黃妍榛 國立澎湖科技大學 海洋遊憩系副教授
16:40~17:00	題目：風浪試煉下的智慧結晶-吉貝石滬型態的演化 陳昭淵、李明儒 嘉南藥理大學助理教授、國立澎湖科技大學教授	
17:00~17:20	題目：石滬文化傳承與永續價值的探討 -以桃園市新屋區蚵間石滬群為例 許素貞 桃園石滬協會理事	
17:20~17:40	題目：石滬保存紀錄方法回顧與數位保存技術之可能 厲卓正、黃楷迪 陳怡真建築師事務所執行長、 實踐大學媒體傳達設計學系專技助理教授	
17:40~18:00	題目：七美石斧王國～渾然天成的島嶼博物館 邵美華 自由研究者博士	
18:00~18:20	綜合座談	
18:30	晚宴	

Time	Nov. 1, 2025 (Saturday)	
08:00~08:30	報到	
08:30~10:30	專題講座(九) (十)(十一) 海洋文化	主持人/ 評論人
08:30~09:10	專題講座(九) 題目：氣候行動中的光合作用研究—維護地球環境與珊瑚礁生態系之永續 河合-久保田寿子 日本山形大學副教授	主持人： 王明輝 國立澎湖科技大學 通識教育中心教授
09:10~09:50	專題講座(十) 題目：臺灣鯨豚發展史：從捕獵到賞鯨與保育之歷程 陳璋玲 國家海洋研究院院長、國立成功大學教授	
09:50~10:30	專題講座(十一) 題目：新屋石滬群及其周邊聚落之韌性評估 周錦宏 國立中央大學客家語文暨社會科學學系教授	
10:30~10:40	茶敘時間	
10:40~11:40	主題：海洋文化遺產	
10:40~11:00	題目：世界遺產潛力點中的存在真實性：澎湖二崁聚落的文化旅遊研究 陳中傑 澳門城市大學碩士	主持人： 景祥祜 曾任香港城市大學圖書館館長、特別顧問（傳統文化遺產保護與傳承） 燈塔古蹟保育研習實踐研究群創始人 評論人： 韓明娟 世新大學觀光學系副教授
11:00~11:20	題目：《鏡花緣》的海洋書寫特性研究 鍾惠寧、沈培佳 澳門城市大學葡語國家研究院碩士生 廣州南方學院文學與傳媒學院文學學士	
11:20~11:40	題目：新得韓德善登舊西嶼塔燈的文獻記載，並比較新、舊記載的差異 謝鶯興 曾任東海大學圖書館館員(圖書館特藏組） 燈塔古蹟保育研習實踐研究群學科顧問(漢文古籍）	
11:40~12:40	主題：海洋文化永續發展	
11:40~12:00	題目：海洋藍綠菌中特殊酵素促進高效電子傳遞反應之分子基礎--邁向高效二氧化碳同化與氣候變遷緩解 色川璃音、河合文啓、河合-久保田寿子 日本山形大學碩士生、博士後研究員、副教授	主持人： 陳璋玲 國家海洋研究院院長、國立成功大學教授 評論人： 薛怡珍
12:00~12:20	澎湖民俗植物於漁業行為中的應用 王曉嬋 財團法人海洋公民基金會執行長	

Time	Nov. 1, 2025 (Saturday)	
12:20~12:40	題目：從食魚教育看海洋文化的永續轉譯—以「年年有鰆」的地方實踐為例 巫佳容 年年有鰆創辦人	國立臺南大學生態暨環境資源學系 副教授
12:40	閉幕	
12:40-14:00	午餐(澄澄餐廳)	
14:00	賦歸	

Time	Nov. 1, 2025 (Saturday)	主持人
13:00~13:30	前往紅羅石滬	楊馥慈 離島出走團隊
13:30~15:00	紅羅石滬踏查	
15:00~15:20	前往果葉石滬	
15:20~16:00	果葉石滬踏查	
16:00~16:20	前往隘門石滬	
16:20~16:40	隘門石滬踏查	
16:40	賦歸	

主持人/評論人
簡歷

方祥權 Shyang-Chyuan Fang

POSITION

Dean, College of Tourism and Leisure, National Penghu University of Science and Technology

SPECIALIZED FIELD

Environmental Education / Sustainable Tourism / Marine Ecology

EXPERIENCE

Deputy Director, Environmental Protection Bureau, Penghu County Government

胡俊傑 Chun-Chieh Hu

POSITION

Professor, Department of Marine Recreation, National Penghu University of Science and Technology

SPECIALIZED FIELD

Ecotourism Tourism Marketing Strategic Management

EXPERIENCE

- Chief Director of Consultant Section of Penghu Tourism Union
- Dean of the College of Tourism and Leisure, National Penghu University of Science and Technology
- Head of the Department of Marine Recreation, National Penghu University of Science and Technology
- CEO of Tianhe Ltd.
- Confidential Secretary of the Penghu County Government
- Penghu County Councilor

于錫亮 Shyi-Liang Yu

CURRENT POSITION/INSTITUTION

Professor, Department of Tourism and Leisure,
National Penghu University of Science and Technology
300 Liu-Ho Road, Makung, Penghu 88046, Taiwan
Telephone:+886-6-9264115 ext. 1081
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Email:slyu@gms.npu.edu.tw

EDUCATION

1996 Ph.D., Department of Forestry, Fisheries, and Wildlife, University of Nebraska, NE, USA
1991 M.S., Department of Forestry, Fisheries, and Wildlife, University of Nebraska, NE, USA

TEACHING CAREER

2012/08-2016/02: Professor and Secretary General, National Penghu University of Science and Technology.
2004/08-2010/08: Professor and Chairperson, Department of Tourism and Leisure, National Penghu University of Science and Technology.
2002/08-2004/08: Associate Professor and Curator of Library, National Penghu University of Science and Technology.
1998/02-2002/02: Assistant Professor, Department of Tourism and Leisure, National

Penghu University of Science and Technology.
1998/08-1999/08: Assistant Professor and Director of General Affairs,
National Penghu University of Science and Technology.

郭奇正 Chi-Jeng Kuo

講者郭奇正為東海大學建築系教授，大學時代接受東海大學學生社團野鳥社之啟蒙，以及台灣成立的第一個國家公園的第一批生態解說員的培訓，開始對生態保育工作持續投注心力。2009 年台灣國家重要溼地之保育工作上路後，隨即嘗試將其自身多年參與社區總體營造之經驗加入濕地的保育工作。2016 年中因緣際會地接觸到後龍石滬的保存調查工作，尤其是該年兩次接續的颱風後在地居民的緊急搶修工作，讓其開始不僅對於石滬的構築形式，也對石滬構築過程中的在地社會動員方式及社會默契產生興趣。2018 年接受文化部文化資產局之委託，接續澎湖石滬達人林文鎮老師生前未竟之工作，完成了全國石滬的第二階段普查，並由此開始面對社會大眾的另一階段的石滬解說。

Prof. Kuo is professor of Dept. of Architecture, Tunghai University currently. During his university years, he was inspired by the Wild Bird Club, a student organization at Tunghai University, and trained as one of the first ecological interpreters for Taiwan's first national park Kenting. This led him to continuously dedicate himself to ecological conservation.

After Taiwan's nationally important wetland conservation efforts initiated in 2009, he immediately sought to incorporate his many years of experience in community development into wetland conservation efforts. In mid-2016, he came across the preservation and investigation work of the Houlong Stone Tidal Weir, especially the emergency renovating work by local residents after two consecutive typhoons that year. This made him interested not only in the construction form of stone tidal weirs, but also in the local social mobilization methods and social tacit understanding during the construction process. In 2018, commissioned by the Bureau of Cultural Heritage of the Ministry of Culture, he continued the unfinished work of Mr. Lin Wenzhen, a master of Penghu stone weirs, and completed the second phase of the national stone tidal weirs survey, thus starting another stage of stone weirs explanation to the public.

黃妍榛 Yen- Chen Huang

POSITION

National Penghu University of Science and Technology
Department of Marine Recreation Associate Professor

SPECIALIZED FIELD

Marine Recreation Management, Integrated Planning of Yacht Marinas, Recreational Fishing and Site Management, Yacht Tourism, Cruise Tourism, Sport Marketing, Sport Communication and Public Relations, Competency Standards, Aquatic Competence, Scuba Diving, and Powerboating.

EXPERIENCE

1. Editorial Board Member, 2025 National Ocean Policy White Paper, Ocean Affairs Council
2. Member, 8th and 9th Term Task Force on Marine Education, Ministry of Education
3. 4th Term Professional Advisory Committee Member, Ocean Affairs Council
4. Committee Member, Integrated Development Advisory Group for Yacht Marinas (2022–2025), Maritime and Port Bureau, Ministry of Transportation and Communications
5. Planning Committee Member, 2027–2031 National Marine Education Development Plan
6. Committee Member, Evaluation Framework Development Task Force for Marine Protected Areas (2023–2024), Ocean Conservation Administration, Ocean Affairs Council
7. Committee Member, Recreational Fishing Zone Management Promotion Committee (2023–2025), Maritime and Port Bureau
8. Committee Member, Site Inspection and Counseling Program for Lifeguard Training and Certification System (2024–2025)
9. Executive Advisory Committee Member, 6th Term, Taiwan Marine Education Center

王明輝 Ming-Huei Wang

POSITION

Professor, General Education Center, National Penghu University of Science and Technology

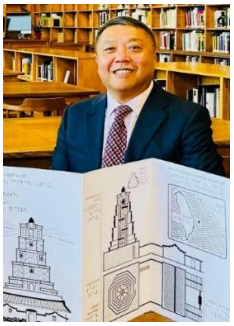
SPECIALIZED FIELD

Non-profit Organization study, Community Study, Emigration Study

EXPERIENCE

Dean, College of Humanities and Management, NPU

景祥祐 Steve H. Ching



POSITION

Founder of Lighthouse Heritage Research Connections

燈塔古蹟保育研習實踐研究群創始人

SPECIALIZED FIELD

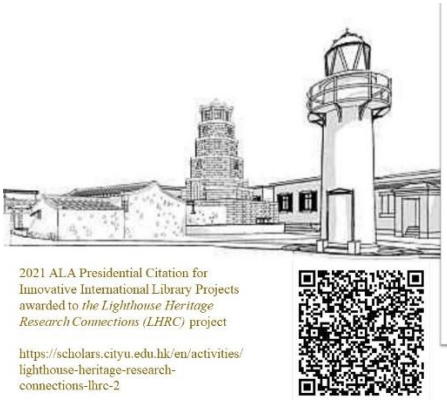
Lighthouse Heritage, David Marr Henderson Collection, Digital Humanities, Library Consortium Development, Regional Economics

燈塔古蹟保育、韓德善特藏研究、數位人文、圖書館聯盟發展、區域經濟學

EXPERIENCE

Former University Librarian & Special advisor (Preserving and Appraising Traditional Cultural Heritage), City University of Hong Kong and Former University Librarian, Economics & Management Professor of Feng chia University

曾任香港城市大學圖書館館長、特別顧問（傳統文化遺產保護與傳承）、逢甲大學圖書館館長、經濟與管理學教授



韓明娟 Ming-Chuan Han

POSITION

Associate Professor**,** Department of Tourism, Shih Hsin University

SPECIALIZED FIELD

Regional Revitalization, Ecotourism, Undergraduate Career Development in Tourism, Tourism Customer Service Management, Corporate Social Responsibility and Human Resource Management (CSR-HRM), Green Service Behavior in Tourism, Airline Ticketing.

EXPERIENCE

- Airline Company Officer
- Certified CPAS Career Consultant
- Travel Agency Manager (Certified)
- Licensed Mandarin Tour Guide
- Licensed English Tour Leader

EDUCATION

Ph.D. in Business Administration, National Taiwan University of Science and Technology

RESEARCH INTERESTS

- Undergraduate Career Construction Inventory and Perceived Employability
- Undergraduate Decision-Making Learning Experiences and Career Exploration Outcomes
- Corporate Social Responsibility and Human Resource Management (CSR-HRM) and Employee Green Creativity in the Hospitality Industry

- Service Management and Employee Well-being in the Tourism Industry
- Positive Psychological Capital and Emotional Labor among Hospitality Employees

SELECTED PUBLICATIONS (Past 5 Years)

1. Hwang, P.-C., & Han, M.-C. (2025, January). *Vitalizing to learn for service proactivity: Not all forms of organizational support are equal.* Journal of Hospitality & Tourism Research, 49(1), 72–83. (Corresponding author)
2. Han, M.-C., & Hwang, P.-C. (2023, July). *Does future work self benefit everyone equally? The moderating role of organizational support for development.* Journal of Career Development, 50(3), 503–518. (First author and corresponding author)
3. Han, M.-C., & Hwang, P.-C. (2021, September). *Crafting job and leisure activities when you are overqualified.* Journal of Hospitality and Tourism Management, 48, 146–154. (First author)
4. Han, M.-C., & Hwang, P.-C. (2021, September). *Who will survive workplace ostracism? Career calling among hotel employees.* Journal of Hospitality and Tourism Management, 49, 164–171. (First author and corresponding author)
5. Han, M.-C., & Hwang, P.-C. (2019, April). *How leader secure-base support facilitates hotel employees' promotive and prohibitive voices: Moderating role of regulatory foci.* International Journal of Contemporary Hospitality Management, 31(4), 1666–1683. (First author)
6. Hwang, P.-C., & Han, M.-C. (2019, January). *Does psychological capital make employees more fit to smile? The moderating role of customer-caused stressors in view of JD-R theory.* International Journal of Hospitality Management, 77, 396–404. MOST 105-2410-H-346-009. (Corresponding author)

COURSES TAUGHT

Leisure and Practice Courses

- Tourism Culture and Regional Revitalization
- Tour Guiding Practice
- Ecotourism
- Airline Ticketing Management
- Airline Ticketing Applications and Practice
- Case Studies in Hospitality and Tourism

Tourism and Hospitality Management Courses

- Hotel Management
- Chain Restaurant Management
- Marketing Communication
- Tourism Service Quality Management
- Organizational Behavior in Hospitality and Tourism

- Consumer Behavior in Hospitality and Tourism
- Research in Food and Beverage Management (Graduate Program)
- Human Resource Management (Graduate Program)

CONTACT INFORMATION

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Office: Department of Tourism, Shih Hsin University
No. 111, Sec. 1, Mu-Cha Road, Taipei 11604, Taiwan

陳璋玲 Chung-Ling Chen

POSITION

President, National Academy of Marine Research

SPECIALIZED FIELD

Marine policy

EXPERIENCE

Professor, Department of Hydraulic and Ocean Engineering, Institute of Ocean Technology and Marine Affairs, National Cheng Kung University

薛怡珍 I-Chen Hsueh

POSITION

Associate Professor, Department of Ecology and Environmental Resources, National Tainan University

SPECIALIZED FIELD

Landscape Ecology, Landscape Planning, Ecotourism, Environmental Education, Environmental Board Game Design

EXPERIENCE

At least 20 Environmental board games, Certified environmental education personnel, Committee of Public Construction Commission

楊馥慈 Fu-Tzu Yang

POSITION

離島出走工作室 負責人
Director, Isle.Travel Studio

SPECIALIZED FIELD

石滬文化、地方創生
Stone Weir Culture, Regional Revitalization

EXPERIENCE

《回到滬之島：澎湖石滬與里海生活誌》作者
澎湖石滬資訊平台 共同創辦人
國家發展委員會-地方創生青年培力工作站-澎湖縣湖西鄉區計畫主持人
Tatler Gen.t 亞洲新銳先鋒獎
澎湖縣政府青年事務委員會青年委員
湖西鄉紅羅社區發展協會總幹事
國立澎湖科技大學觀光休閒系碩士生

講者簡歷

William F Jeffery

NATIONALITY

Australian

POSITION: Associate Professor, Anthroipology, University of Guam

SPECIALIZED FIELD

- **World War II Maritime Archaeology**: Consultant to develop a Management Plan for the Chuuk Lagoon shipwrecks, FSM, August 2020; collaboration with National FSM Historic Preservation Office, the FSM National Commission for UNESCO, and UNESCO Pacific Office, Apia, Samoa regarding World War II UCH in Chuuk, FSM
- **Hong Kong / East Asian Maritime Archaeology**: Ongoing research collaboration with the Hong Kong Maritime Museum and the Hong Kong Underwater Heritage Group—completed three projects under licence from the responsible government office (Antiquities and Monuments Office) from 2010-2016—with some of the project results exhibited at the museum
- **Asia-Pacific Maritime Archaeology**: Co-chair of 4th Asia-Pacific Conference on Underwater Cultural Heritage 2020 in Taiwan; collaboration with Oceanic countries on the protection and management of underwater cultural heritage through the ratification of the UNESCO Convention on the Protection of Underwater Cultural Heritage.
- **Micronesian and Austronesian Maritime Archaeology Research and Connectivity**: Research collaboration with Yap HPO, FSM; Bureau of Cultural Heritage, Ministry of Culture, Taichung, Taiwan: and the National Penghu University of Science and Technology, Magong, Penghu regarding traditional indigenous fish weirs, the associated Living Heritage and Cultural Landscapes.

EXPERIENCE

- Co-PI of United Nations Decade of the Ocean Action titled, “Indigenous People, Traditional Ecological Knowledge, and Climate Change: the Iconic Underwater Heritage of Stone Tidal Weirs”, in collaboration with the Tokyo University of Marine Science and Technology, and colleagues from six other universities in South Korea, Japan, Philippines, Ireland, South

Africa, and Poland, endorsed by the UNESCO Intergovernmental Oceanographic Commission;

- PI for American Battlefield Protection Program, US National Park Service project, titled: 'The Holistic Heritage of the World War II Chuuk (Truk) Lagoon Battlefield: Creating Awareness and Partnerships for Sustainable Stewardship' 2023-2024;
- PI for a Cooperative Ecosystem Studies Unit (CESU) Agreement between UOG and the US Department of Interior (National Park Service), on the in-situ corrosion prevention (sacrificial anodes placement) on the WWII Amtrac located at Agat 2023;
- Conference Organizing Committee Chair of 3rd Asia-Pacific Conference of Underwater Cultural Heritage (APCONF) in Hong Kong, November 27 to December 1, 2017; and Co-Chair of Conference Organizing Committee 4th APCONF in Taiwan (online) November 1-2, 2021, and member of the 2023 APCONF in South Korea;
- Section 106 National Historic Preservation Act investigation, Hotel Wharf, Apra Harbor, Guam;
- Keynote speaker at International Forums on Underwater Cultural Heritage in Taiwan in 2008, 2017, 2019, and Apia, Samoa in 2018;
- Collaboration with the Federated States of Micronesian government, resulting in them ratifying the UNESCO Convention on the Protection of Underwater Cultural Heritage in 2018;
- Conducted a desk-top review of Port Royal, Jamaica for ICOMS, which was being nominated for World Heritage Listing in 2018;
- Implementation of a number of consultancies for UNESCO, and in Guam, Palau, FSM, Hong Kong and Australia;
- Invited speaker to conferences and consultations in Italy, Mongolia, Taiwan, Korea, China, Samoa (UNESCO), FSM and Hong Kong
- Specialist Editor for the UNESCO publication, *Research on Good Practice in the Protection and Management of WWII-Related Underwater Cultural Heritage in the Pacific Small Island States and Territories.* UNESCO, Apia
- In 2010, 2014, 2016, I designed and led three maritime archaeology projects in Hong Kong pursuant to a 'Licence to Excavate' from the Hong Kong Antiquities and Monuments Ordinance (Cap. 53) 1976 and reported on the findings
- Research and management investigations of maritime and underwater cultural heritage sites (and the associated intangible heritage) in Hong Kong, Sri Lanka, Federated States of Micronesia, Guam, Tanzania, South Africa, Mozambique, Australia and New Zealand.
- Implemented c. 40 Marine Archaeology Investigations (MAI) as part of the Environmental Impact Assessment process in Hong Kong as a consultant to ERM Hong Kong
- In 2011, compiled a successful US National Register of Historic Places nomination of the World War II Amtrac located in Agat, Guam in association with the 2009 Maritime Archaeology Field School participants
- Convener of three International Conferences on Maritime Archaeology in Australia and also convened sessions at International Conferences, namely the 5th World Archaeology Congress (WAC), Washington, USA in 2003; 6th WAC in Dublin, Ireland in 2008; and 8th WAC in Kyoto, Japan in 2016
- From 2006-2008, I formulated, and co-PI an EarthWatch project on the Chuuk Lagoon World War II underwater cultural heritage

- Joint Maritime Archaeological Supervisor for *Advonster* shipwreck project 2003 (Galle, Sri Lanka) and Maritime Archaeological Supervisor for project in November / December 2005—a joint Dutch / Sri Lankan government project.
- Primary lecturer for the UNESCO sponsored Maritime Archaeology Field School in Galle, Sri Lanka, 2006.
- Implemented Maritime Archaeology Field Schools in Chuuk (FSM), Palau, Guam, Australia, South Africa and Tanzania
- Since 2006, I have completed a number of maritime archaeology contracts with the Guam Historic Preservation Office and the Guam Preservation Trust which has included compiling a successful nomination for the USA National Register of Historic Places
- Advisor to the Palauan government in 2006 in regard to the prosecution of foreign divers for illegally recovering material from Japanese World War II shipwrecks.
- Implemented UK Nautical Archaeology Society (NAS) training programs in Australia, Federated States of Micronesia, Guam, Hong Kong, Taiwan, South Africa, Tanzania, Mozambique and Samoa
- Represented the Federated States of Micronesian government at the Conference on the *UNESCO Convention on the Protection of the Underwater Cultural Heritage* in Hong Kong in November 2003 and the International Committee of Underwater Cultural Heritage Annual General Meeting in Galle, Sri Lanka in November 2003
- Received a number of grants from Australian groups, Hong Kong government, Guam Preservation Trust and UNESCO, and successfully negotiated sponsorship for various events and projects
- In 1990, I assisted in an intensive 12-month training program for a number of Chinese maritime archaeologists in Fujian Province, China
- Initiated maritime archaeological research into Australian-built shipwrecks and directed the survey and partial excavation of the *Water Witch* wreck site in 1984
- Commenced the debate that led to the development of the Australian Historic Shipwrecks National Research Plan in 1995
- HMS *Pandora* expedition, archaeological team leader 1983, 1984, 1997, 1998 and archaeological supervisor 1999
- As part of these activities, I have worked and liaised with a range of personnel, including National and State government politicians, military personnel, specialists, and members of the general public and special interest groups.

田和正孝 Masataka TAWA

POSITION

関西学院大学名誉教授
Emeritus Professor of Kwansei Gakuin University
博士（地理学） Doctor of Geography

SPECIALIZED FIELD

Geography of Fisheries

著作 BOOKS

『変わりゆくパプアニューギニア』（単著），1995 年，丸善・
『漁場利用の生態』（単著）1997 年，九州大学出版会・
『海人たちの自然誌―アジア・太平洋における海の資源利用―』（共著），1998 年，関西学院大学出版会・
『東南アジアの魚とる人びと』（単著），2006 年，ナカニシヤ出版・
『石干見』（編著），2007 年，法政大学出版局・
『石干見に集う―伝統漁法を守る人びと』（編著），2014 年，関西学院大学出版会・
『石干見のある風景』（編著），2017 年，関西学院大学出版会・
『石干見の文化誌―遺産化する伝統漁法』（単著），2019 年，昭和堂・
『明石浦漁業誌』（編著），2025 年，明石浦漁業協同組合・

宋聖榮 Sheng-Rong Song

POSITION

Professor, Department of Geosciences, National Taiwan University

Professor, Department of Geosciences, National Taiwan University

Visiting Professor at the Energy Geosciences Institute, University of Utah, USA

Visiting Professor at the Institute of Geothermal Sciences, Kyoto University, Japan

SPECIALIZED FIELD

Geology, Volcanology, Geochemistry, Geothermal Energy

Delegate, National Committee of the International Union of Quaternary Research

Secretary General, Geological Society located in Taipei2008~present: Executive member of Chinese Geosciences Union, ROC

Executive member of Geological Society located in Taipei, ROC

Delegate and Chair, National Committee of the International Association of Volcanology and Chemistry of the Earth's Interior(IAVCEI), International Union of Geodesy and Geophysics (IUGG)

EXPERIENCE

President of International Geohazard Research Society, 2016-2018

Guest editor: Taiwan Chelungpu-fault Drilling Project (TCDP): Site characteristics and on-site measurements; Terrestrial, Atmospheric & Oceanic Sciences, 2006.

Guest editor: Taiwan Potential Geohazards of the Taipei Metropolitan Area; Terrestrial, Atmospheric & Oceanic Sciences, 2010.

Guest editor: Asian Tectonics and Resources; Journal of Asian Earth Sciences, 2017.

Guest editor: Taiwan Geothermal Energy, Geothermics, 2017.

To date, 178 research articles have been published, including more than 33 that contribute to the H-index, with a total citation count exceeding 3,000.

Keat Gin Ooi

NATIONALITY

Malaysian

POSITION

Professor of the modern history of Brunei/Borneo at the Academy of Brunei Studies, Universiti Brunei Darussalam, Brunei and visiting professor of the Korean Institute of ASEAN Studies, Busan University of Foreign Studies, Busan, South Korea.

SPECIALIZED FIELD

Having an area of specialization in Southeast Asia, his varied expertise ranged from wars and conflicts, sociocultural and socioeconomic history, war literature, biographical studies, urban colonial history to gender studies, modern Malay literature, food culture (street foods), underwater cultural heritage (UCH), heritage of former colonial port-cities.

EXPERIENCE

He is a Fellow (since 1996) of The Royal Historical Society (RHS) , London and associate editor (since 2019) of *SUVANNABHUMI: Multi-disciplinary Journal of Southeast Asian Studies*. Once served as coordinator (2002-2019) of the Asia Research Unit (APRU), School of Humanities, Universiti Sains Malaysia, and founding-editor (2004-2019) of *International Journal of Asia Pacific Studies* (IJAPS), a Scopus-indexed scholarly journal.

敷田麻実 Asami SHIKIDA

POSITION

Research Institute of Regional and Urban Planning (RIRUP)
Emeritus Professor of Japan Advanced Institute of Science and Technology(JAIST)

SPECIALIZED FIELD

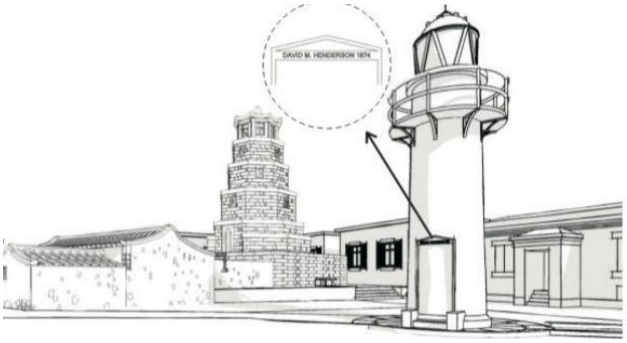
Community resource management

EXPERIENCE

Asami SHIKIDA has extensive experience in community management, focusing on sustainable regional and community development. He completed his graduate studies in Coastal Zone Management at James Cook University in Australia and earned his PhD from the Graduate School of Kanazawa University. In 1998, he joined the Department of Environmental Systems Engineering at the Kanazawa Institute of Technology as an Associate Professor, and in 2004, he became a Professor in the Department of Information Management. In 2007, he moved to Hokkaido University as a Professor at the Center for Advanced Tourism Studies.

Throughout his career, Dr. Shikida has been actively involved in research on community resource-based development strategies and community autonomy, with a particular focus on the dynamic relationship between rural and urban areas. He has also served as Chairman of the Wildlife Conservation Society (2005–2011), as well as on the Shiretoko World Natural Heritage Site Regional Liaison Committee and the Environmental Council of Japan's Ministry of the Environment.

Felicity Somers Eve



A Legacy Across Generations: From Heritage to Stewardship

Historical Heritage

- The Fisher Island Lighthouse in Penghu (commissioned 1875) was designed by her great-grandfather, David Marr Henderson.
- Recruited in 1869 as the Chief Lighthouse Engineer for the Qing dynasty, Henderson was responsible for designing 34 lighthouses along the China coast.
- His professional collection—including design drawings, photographs, and correspondence, known as the "Henderson Collection"—was later brought back to the United Kingdom.

Continuing the Legacy

- In 2012, Felicity rediscovered this invaluable family archive and arranged for its professional conservation in a climate-controlled archival institution.
- For over a decade, she has collaborated with *Lighthouse Heritage Research Connections* Project Team to decipher and transcribe the 150-year-old handwritten manuscripts.
- She has conducted field studies at multiple historic lighthouses, including:
  - ✓ Dongju (Mazu)
  - ✓ Waglan Island (Hong Kong)
  - ✓ Eluanbi (Pingtung)
  - ✓ Fisher Island (Penghu)

Her work provides critical insight into Henderson’s collection and supports lighthouse heritage preservation efforts in the world.

跨世代的傳承：從建築遺產到守護傳承

燈塔建築手繪設計圖紙的守護

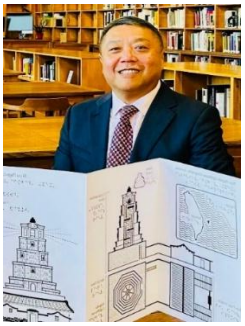
- 漁翁島燈塔的興建，與一位傑出英國工程師 David Marr Henderson（1840 – 1923，中文名字：韓德善）緊密相連。1868 年，韓德善受清海關總稅務司赫德 （Robert Hart ）之 聘，出任近代中國第一任燈塔總工程師，在華服務近三十年，親手設計了 華北、華東、華南及台灣海峽沿岸共 34 座主要燈塔 的新建與改建工程。
- 漁翁島燈塔是韓德善燈塔事業的重要里程碑。自 1872 年起，他多次到澎湖西嶼，考察具閩南建築風格的舊西嶼塔燈及其附屬建築（塔身與天后宮），綜合評估後向赫德提交改建計畫。漁翁島燈塔完成改建，1875 年 12 月 20 日點燈。
- 1898 年，韓德善退休返回英國，將其個人燈塔專業典藏——包含手繪燈塔站建築、燈籠、燈器設計原圖、繪圖工具和相關照片與書信，匯集於一木箱，由上海帶回英國，1923 年，韓德善去世後，這個木箱一直存放於韓德善唯一的女兒（Constance Marr Henderson）家中。2008 年，韓德善的曾外孫女桑 Felicity Somers Eve 在其外祖母的遺物中，發現了這批資料。

燈塔建築設計手稿傳承與延續

- 2012 年，Felicity Somers Eve 和劍橋大學和補里斯托大學的教授們重新發現這份極具歷史價值的家族檔案，以「韓德善特藏」集中寄存於英國土木工程師學會，這批珍貴文獻和文物目前在該學會的專業檔案館進行恆溫保存和專業編目。
- 十餘年來，她與「燈塔古蹟研習實踐研究群（LHRC）」合作，持續解讀、轉錄與詮釋這批以十九世紀以古英文書寫的手稿資料，並親赴多座歷史燈塔進行田野研究，包括：東莒燈塔（馬祖）、橫瀾島燈塔（香港）、鵝鑾鼻燈塔（屏東）、漁翁島燈塔（澎湖）

她的研究不僅為「韓德善特藏」建立了重要的文獻詮釋基礎，也為全球燈塔文化遺產的保存、研究與教育推廣開啟了新的篇章。

景祥祜 Steve H. Ching



POSITION

Founder of Lighthouse Heritage Research Connections
燈塔古蹟保育研習實踐研究群創始人

SPECIALIZED FIELD

Lighthouse Heritage，David Marr Henderson Collection, Digital Humanities, Library Consortium Development, Regional Economics
燈塔古蹟保育、韓德善特藏研究、數位人文、圖書館聯盟發展、區域經濟學

EXPERIENCE

Former University Librarian & Special advisor (Preserving and Appraising Traditional Cultural Heritage), City University of Hong Kong and Former University Librarian, Economics & Management Professor of Feng chia University
曾任香港城市大學圖書館館長、特別顧問(傳統文化遺產保護與傳承)、逢甲大學圖書館館長、經濟與管理學教授

郭奇正 Chi-Jeng Kuo

講者郭奇正為東海大學建築系教授，大學時代接受東海大學學生社團野鳥社之啟蒙，以及台灣成立的第一個國家公園的第一批生態解說員的培訓，開始對生態保育工作持續投注心力。2009 年台灣國家重要溼地之保育工作上路後，隨即嘗試將其自身多年參與社區總體營造之經驗加入濕地的保育工作。2016 年中因緣際會地接觸到後龍石滬的保存調查工作，尤其是該年兩次接續的颱風後在地居民的緊急搶修工作，讓其開始不僅對於石滬的構築形式，也對石滬構築過程中的在地社會動員方式及社會默契產生興趣。2018 年接受文化部文化資產局之委託，接續澎湖石滬達人林文鎮老師生前未竟之工作，完成了全國石滬的第二階段普查，並由此開始面對社會大眾的另一階段的石滬解說。

Prof. Kuo is professor of Dept. of Architecture, Tunghai University currently. During his university years, he was inspired by the Wild Bird Club, a student organization at Tunghai University, and trained as one of the first ecological interpreters for Taiwan's first national park Kenting. This led him to continuously dedicate himself to ecological conservation.

After Taiwan's nationally important wetland conservation efforts initiated in 2009, he immediately sought to incorporate his many years of experience in community development into wetland conservation efforts. In mid-2016, he came across the preservation and investigation work of the Houlong Stone Tidal Weir, especially the emergency renovating work by local residents after two consecutive typhoons that year. This made him interested not only in the construction form of stone tidal weirs, but also in the local social mobilization methods and social tacit understanding during the construction process. In 2018, commissioned by the Bureau of Cultural Heritage of the Ministry of Culture, he continued the unfinished work of Mr. Lin Wenzhen, a master of Penghu stone weirs, and completed the second phase of the national stone tidal weirs survey, thus starting another stage of stone weirs explanation to the public.

李其霖 Chi-Lin Lee

POSITION

Professor and Chair, Department of History, Tamkang University

Deputy Director, Center for Marine and Underwater Technology Research, Tamkang University

SPECIALIZED FIELD

Maritime History, Taiwan History, and Cultural and Creative Industries

EXPERIENCE

Postdoctoral Research Fellow, Institute of History and Philology, Academia Sinica
Postdoctoral Research Fellow, National Taiwan Normal University
Collection Committee Member, National Science and Technology Museum

陳昭淵 Chao-Yuan Chen

POSITION

Assistant Professor

SPECIALIZED FIELD

Penghu Stone Fish Weir Research

EXPERIENCE

Department of Recreation and Healthcare Management,
Chia Nan University of Pharmacy and Science.

許素貞 Susan Hsu

POSITION

理事｜桃園石滬協會

Director, Taoyuan Stone Tidal Weirs Association

SPECIALIZED FIELD

桃園石滬修造技術保存者

桃園市新屋區蚵間石滬群修復技師

Preserver of Stone Tidal Weir Construction Techniques

Restoration Technician, Kejian,Stone Tidal Weir Group, Xinwu District, Taoyuan City

EXPERIENCE 經歷

創會理事｜桃園石滬協會

Founding Director, Taoyuan Stone Tidal Weirs Association

2019 年~2023 年完成桃園新屋蚵間九座石滬修復工作

From 2019~2023, the restoration of 9 Stone Tidal Weirs in Kejian, Xinwu District,Taoyuan county, have been completed

提倡蚵間石滬文化傳承及保存行動

Advocate the inheritance and preservation of stone tidal weirs culture in Kejian area.

積極復甦在地媽祖海祭慶典

Actively revive the local Mazu Sea Festival celebration

厲卓正 Cho-Cheng Li

POSITION

CEO, S. Architects Union

SPECIALIZED FIELD

Architecture Design

Stone Weirs Preservation

EXPERIENCE

S. Architects Union, 2017~

邵美華 Mei-Hua Shao

POSITION

Independent researcher

SPECIALIZED FIELD

Manufacture of Basalt Stone Axes, Manufacture of Nephrite Axes

EXPERIENCE

Assistant Professor, Center for General Education, Tunghai University
Assistant Professor, Department of Arts & Culture, Open University of Kaohsiung
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AWARDS

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- Title of Distinguished Researcher, Yamagata University (FY2023)
- *Poster Award,* The Annual Meeting of the Crystallographic Society of Japan (FY2014)
- *Best Poster Award,* The 9th Symposium of the Japanese Society of Photosynthesis Research (FY2009)

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Tourism Experience and Authenticity Studies; Cultural Heritage and Wellness Tourism; User-Generated Content (UGC) and Text Mining; Sustainable Hospitality Research

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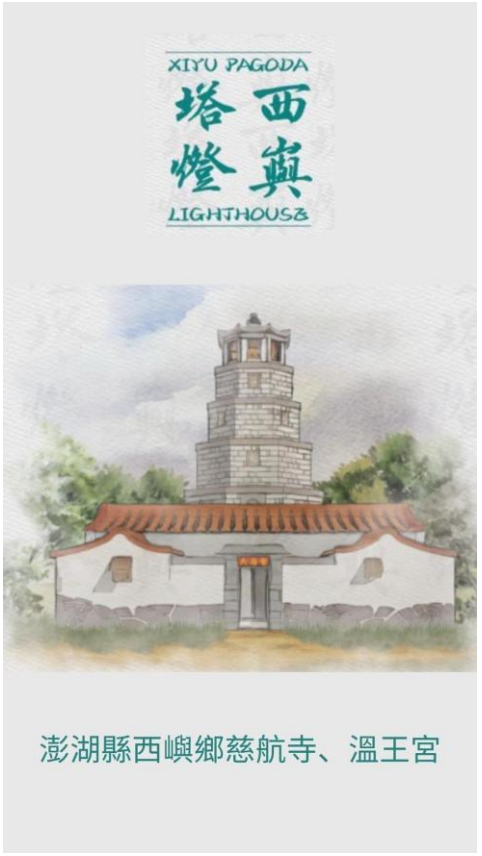

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2018.11.22 海洋委員會海洋保育署—海洋保育研討會：「澎湖海廢治理困境與經驗分享」

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中、日、英文摘要

Traditional Pacific Islander Connections with the coast and sea in Oceania

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Abstract

Penghu is famous for its stone-walled tidal fish weirs (*shi hu*), with an estimated 600 located in the archipelago. In Remote Oceania, Yap (Federated States of Micronesia, FSM) contains an estimated 800 stone-walled tidal fish weirs (*aech*). While not recognized as World Heritage by its government, as is the case in Penghu, the Yapese *aech* are a valuable source of knowledge about how they developed Traditional Ecological Knowledge (TEK) and fished sustainably for hundreds of years.

This paper will explore a fish weir project that was accepted by the Intergovernmental Oceanic Commission (IOC) of UNESCO in context with the objectives and challenges of the Ocean Decade to propose some actions for discussion and as a possible way forward. It utilises the fish weirs of Yap as a case study to provide a real-world example in furthering this discussion in developing an effective strategy for the project in general. The paper also places this discussion into context with current marine conservation issues, such as global warming, in addition to the issues of management of marine world heritage sites at a UNESCO level.

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台湾における石滬研究の系譜―日本人漁業地理学者のまなざし

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要旨

小論は、台湾における石滬研究の系譜について、日本の漁業地理学者である筆者の眼を通して考察するものである。小論の目的は２つある。ひとつは、1990 年代に漁業地理学的研究を先駆けとして開始され、すでに 30 年以上にわたって蓄積されてきた石滬研究の流れを把握することである。研究史には、回顧する側の専門性によって複数のストーリーが構築されると考えられる。石滬に対しては、様々な専門性を有した研究者が注目し、研究が重ねられてきた。すなわち地理学（人文地理学）という狭隘な専門性に留まってきたわけではない。そのため、小論では不十分ではあるものの、専門性の異なる多くの既往文献を取りあげて、学際的な立場から研究を回顧してみたい。もうひとつの目的は、石滬の文化遺産化が研究・教育レベル、行政レベルのみならず市民レベルにおいても強く意識されるなか、それがいかにして進展してきたのかを明らかにすることである。文化遺産化の背後にどのような経済的・社会的要因あるいは文化的要因が存在したのかを考察してみたい。そのことが、今後の石滬研究にとどまらず、石滬の保全と活用に関わる諸活動にも影響を及ぼすと考えるからである。

キーワード：石滬、漁業地理学、陳憲明、文化遺産、澎湖諸島

台灣石滬研究的發展脈絡-從日本漁業地理學者的視角探析

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摘要

本研究旨在以一位日本漁業地理學家的視角，整理台灣石滬研究的譜系。本研究的目標有兩個。首先，旨在梳理石滬研究的歷史。石滬研究始於 1990 年代，作為漁業地理的先驅領域，至今已累積了 30 多年的研究成果。我認為，研究史可以建構出多種敘事，這取決於研究者的專業知識。石滬吸引了各領域研究人員的關注，並已成為廣泛研究的對象。換句話說，石滬的研究範圍並不限於地理學（人文地理學）這個狹隘的領域。因此，儘管本研究尚不完整，但我希望從跨學科的視角，結合許多現有文獻，對石滬的研究進行回顧。其次，我希望闡明石滬如何成為文化遺產，這個主題不僅在研究，教育和行政層面，而且在民間層面也得到了高度認可。我想探討一下這個文化遺產地位背後的經濟，社會和文化因素。我們相信，這不僅會對未來石滬的研究產生影響，還會對與其保護和利用相關的各種活動產生影響。

關鍵字：石滬、漁業地理學、陳憲明、文化遺產、澎湖諸島

Genealogy of the Research of Stone Tidal Weirs in Taiwan: The Perspective of a Japanese Geographer of Fisheries

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Abstract

This paper examines the genealogy of stone tidal weirs research in Taiwan through the eyes of a Japanese geographer of fisheries. This paper has two objectives. The first is to grasp the history of stone tidal weirs research, which began in the 1990s as a pioneering field of fisheries geography and has been accumulated for over 30 years. It is believed that multiple stories can be constructed in a research history depending on the expertise of the person looking back. Stone tidal weirs have attracted the attention of researchers with a wide range of expertise and have been the subject of extensive research. In other words, they have not been confined to the narrow field of geography (human geography). Therefore, although this paper is insufficient, I would like to review research from an interdisciplinary perspective, examining many existing documents with different specialties. The other objective is to clarify how stone tidal weirs have become cultural heritage site, a process that has been strongly recognized not only at the research, education, and administrative levels but also at the citizen level. I would like to consider the economic, social, and cultural factors behind this cultural heritage site designation. We believe that this will have an impact not only on future research into stone tidal weirs, but also on various activities related to their conservation and utilization.

Keywords: Stone tidal weirs, Geography of fisheries, Chen Hsien-Ming, Cultural heritage, Penghu archipelago

澎湖七美島的自然和人文演變

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摘要

七美島位於澎湖南方海域，其地質構造與人文發展歷程在相當程度上可視為澎湖地區整體演變的縮影。綜合現有地質與考古研究，七美島的自然環境與人文變遷可大致劃分為六個主要時期：

1.古太平洋板塊隱沒期：雖然目前在七美島上缺乏此一時期的直接地質紀錄，但根據澎湖地區最古老的岩層證據推測，該階段為古太平洋板塊隱沒作用所形成之基盤地質，對後續沉積與火山活動具有奠基性影響。

2.地殼張裂沉積期：在地殼張裂作用下，於七美島基盤之上沉積了厚層的濱海相沉積物，主要出露於島體的最下部岩層，為後續火山作用提供了穩定的沉積基底。

3.火山活動期：此階段主要發生於中新世中期，島上出現劇烈的火山噴發，釋放大量玄武岩質熔岩與火山碎屑物，並廣泛分布於全島各處。該期的火山作用不僅塑造了七美島現今的地形輪廓，亦奠定了島嶼地質的核心特徵。

4.碰撞造山—火山停止期：約在距今 850 萬年前，臺灣東部發生之造山碰撞事件對區域地殼構造造成重大影響，導致七美島及周邊地區的火山活動逐漸終止。此一構造轉折標誌著火山活動結束與沉積作用再度占優的時期。

5.海水淹沒期：約在距今 500 萬年前，受全球海平面升降控制，七美島一度遭海水大規模淹沒。該階段形成的灘岩主要由殼灰岩組成，現今可見於七美人塚附近公路旁及燈塔下方，為古海侵事件的重要地質證據。

6.人類與玄武岩互動期：進入人類活動主導的時期後，七美島居民充分利用玄武岩資源，將其應用於生活與經濟的多種面向。典型案例包括史前時期的石器製作及傳統石滬漁業技術，顯示人地互動在文化與環境適應上的高度創造性。

關鍵字：玄武岩、澎湖火山活動、海水面升降

Natural and human cultural evolution of Chimei Island, Penghu

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Abstract

Chimei Island, located in the southern waters of the Penghu Archipelago, represents a microcosm of the broader geological and cultural evolution of the entire region. Based on integrated geological and archaeological investigations, the natural and anthropogenic evolutions of Chimei Island can be categorized into six major evolutionary stages:

1.Paleo-Pacific Plate Subduction Stage

Although no direct geological records of this stage have been discovered on Chimei Island, the oldest stratigraphic evidence from the Penghu region suggests that the island's geological basement was primarily formed during the subduction of the Paleo-Pacific Plate. This tectonic event laid the structural foundation for subsequent sedimentary and volcanic processes.

2.Crustal Extension and Sedimentary Deposition Stage

During a phase of lithospheric extension, extensive littoral and shallow-marine sediments were deposited, forming a thick sequence of coastal facies strata. These deposits, primarily exposed in the lowermost rock units of Chimei Island, provided a stable sedimentary substrate that influenced subsequent volcanic activity.

3.Volcanic Activity Stage

This stage occurred predominantly during the Middle Miocene, characterized by intense volcanic eruptions that released significant volumes of basaltic lava flows and pyroclastic deposits. These volcanic products are widely distributed across the island, shaping Chimei's present-day geomorphology and establishing its fundamental basaltic framework.

4.Orogenic Collision and Volcanic Cessation Stage

Around 8.5 million years ago, the orogenic collision in eastern Taiwan caused significant tectonic reorganization in the region. This event disrupted magma supply and led to the gradual cessation of volcanic activity on Chimei Island. The termination of volcanism marks a key transition from a volcanically active regime to one dominated by sedimentary and erosional processes.

5.Marine Transgression Stage

Approximately 5 million years ago, global sea-level fluctuations resulted in the large-scale inundation of Chimei Island. During this period, bioclastic grainstones and coral-derived calcarenites were deposited, forming beach rock assemblages that are now exposed near the Chimei Ren Tomb area, along the roadside, and beneath the lighthouse. These deposits serve as important sedimentological evidence of ancient marine transgressions.

6.Human–Basalt Interaction Stage

In the most recent phase, human activity became the dominant force shaping Chimei

Island's landscape and cultural development. Local inhabitants have made extensive use of the island's basaltic resources in both economic and daily life contexts. Representative examples include the production of prehistoric basalt stone tools and the construction of traditional stone fish weirs (shih-hu), illustrating the creative adaptation of human communities to the island's basalt-dominated environment.

Keywords：Basalt, Penghu's volcanic activity, Sea level change

Underwater Cultural Heritage (UCH) in Asia
Addressing Challenges and Charting Future Pathways

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Abstract

Underwater Cultural Heritage (UCH) refers to "all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years", inter alia, "(i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context; (ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and (iii) objects of prehistoric character" (UNESCO 2001). UCH encompasses sites submerged in both fresh (lakes, rivers) and salt (coasts, seas, oceans) water bodies. The current situation of UCH in Asia is confronted by two major threats, namely climate change and environmental degradation, and adverse human activities. The latter includes commercial salvage operations, destruction and looting of underwater heritage. Nonetheless on the positive flip side, there has been various promising developments: Asian Cultural Heritage Alliance (ACHA) (2021) aimed at improving regional governance; commendable efforts at capacity building by UNESCO Bangkok; the setting-up of national research institutes focusing on UCH; and, technological and scientific advancements in deep-water technology. Nonetheless, there are more that needs to be done in the foreseeable decades ahead inter alia greater national legislation of UCH among Asian countries; the ratification of UNESCO 2001 Convention by more Asian nations; the greater necessity of regional collaboration and coordinated disaster risk reduction schemes across Asia. The present intention is to highlight each of the aforesaid, viz. the current state of UCH in Asia including pressing issues and major challenges it faces; secondly, discuss some positive developments in the field; and, finally propose its future direction and developments across the Asian continent in the decades ahead.

Keywords: Underwater Cultural Heritage (UCH); Asia; addressing issues and challenges of UCH in Asia; current and existing state of UCH in Asia; future developments of UCH in Asia

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Stories (Routledge, 2025); co-edited, with V. T. King, *Routledge Handbook on Contemporary Brunei* (Routledge, 2023); with Kathrina Mohd Daud, *Literature of Brunei: History, Culture, and Challenges* (Routledge, forthcoming). Single-authored volume, *Brunei and the British in the Nineteenth Century: Of a Seer-poet, an Adventurer, and the near extinction of an Ancient Malay Sultanate* (Routledge, forthcoming). Related to underwater cultural heritage and archaeology, inter alia "Maritime Treasures Off Peninsular Malaysia", *Journal of Indo-Pacific Archaeology* 36 (2015): 5-15; Panel Chair, Panel 2: East Southeast Asia, Asian Regional Workshop on the Protection of the Underwater Cultural Heritage, Dalian Maritime University, Dalian, People's Republic of China (PRC), 2-3 December 2021 (Webinar via Tencent VOOV Meeting).

海洋および沿岸の文化資源の持続可能な利用と管理

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要旨

持続可能な開発は、開発途上国および先進国の双方にとって中心的な規範的目標となっている。2015 年には正式に採択された。17 の SDGs のうち、「目標 14：海の豊かさを守ろう」は、海洋および沿岸領域に直接関連している。この目標は、自然資源だけでなく、有形・無形の文化遺産を含む海洋および沿岸資源の保全と持続可能な利用を求めている。これらの文化資源は、海洋や沿岸環境に根ざしているが、近年は陸域における人為的変化によって脅かされつつある。このような状況の中で、これらの資源を持続的に管理し、文化的価値や本質的価値を損なうことなく世代を超えて継承するための政策が、喫緊の課題となっている。本基調講演では、このような資源ガバナンスの実現に向けて、地域資源活用の戦略、価値創造と価値認識の変容および生物文化多様性についての概念を提示する。

キーワード：地域資源、文化資源、持続可能性、資源マネジメント

海洋與沿海文化資源的可持續利用與管理

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摘要

可持續發展已成為發展中國家和發達國家的核心規範性目標，並於 2015 年正式通過。在 17 項可持續發展目標(SDGs)中，“目標 14：保護海洋生態”直接關係到海洋與沿海區域。該目標不僅要求保護自然資源，還包括對有形和無形的文化遺產在內的海洋與沿海資源的可持續利用。雖然這些文化資源根植于海洋與沿海環境，但近年來正面臨來自陸地人為變化的威脅。在這一背景下，如何在不損害其文化價值與本質價值的前提下，實現這些資源的可持續管理並將其代代相傳，已成為亟待解決的課題。本次主題演講將圍繞資源治理的實現，提出區域資源利用戰略、價值創造與認知的轉變，以及生物文化多樣性的相關概念。

關鍵字：區域資源、文化遺產、可持續性、資源管理

Sustainable use and management of marine and coastal cultural resources

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Abstract

Sustainable development has become a central normative goal for both developing and developed countries, and was officially adopted in 2015. Among the 17 Sustainable Development Goals (SDGs), "Goal 14: Life Below Water" is directly related to marine and coastal areas. This goal calls for the conservation and sustainable use of marine and coastal resources, not only in terms of natural resources but also including tangible and intangible cultural heritage. Although these cultural resources are rooted in marine and coastal environments, they are increasingly threatened by anthropogenic changes occurring on land. Under such circumstances, there is an urgent need for policies that enable the sustainable management of these resources, ensuring their transmission across generations without compromising their cultural and intrinsic values. This article presents strategies for utilizing local resources, explores shifts in value creation and recognition, and introduces the concept of biocultural diversity as pathways toward effective resource governance.

Keywords: Community resource, Cultural asset, Sustainability, Resource management

David Marr Henderson
The Man Behind the Lights
The Story of An Exceptional Lighthouse Engineer

Felicity Somers Eve

Great-granddaughter of Lighthouse Engineer David Marr Henderson

Abstract

David Marr Henderson (DMH) was born into an engineering family, both his father and uncle were engineers, his uncle being the Henderson of Fox Henderson & Co. who built The Crystal Palace for The Great Exhibition at 1851. His father had wanted him to run the family estate in Scotland but from a young age DMH showed his talent for both academic studies and drawing. His capabilities were fostered and he firstly undertook an apprenticeship at his uncle's company, at the same time studying at Queens College, Birmingham University and then went on to work for Chance Brothers for nine years where it is believed he was being groomed to become England's lighthouse expert. Owing to an altercation with another member of staff at Chance he was dismissed. This put an end to his career in England but made him available for the job in China. History proves that this was most beneficial for China. During his nearly 30 years of working for the Imperial Maritime Customs Service as technical head of the Chinese Lights Service, Mr. Marr Henderson designed and oversaw the first establishment of 34 Lighthouse stations. Prior to departing for China in 1868 he presented a volume of work at the Institution of Civil Engineers on lighthouse apparatus and laterns for which he gained the Manby Prize and he also gained a patent for a lighthouse lens he had developed. He achieved many world firsts:

- First civil engineer to adopt a cast-iron tower for Chinese lighthouses – Sha Wei Shan in Shanghai in 1871 and he replaced Fisher Island's original pagoda lighthouse in 1875;
- First and only civil engineer to conduct a survey for traditional Chinese lighthouse (he visited Xiyu Pagoda Lighthouse and started the survey in 1872);
- First Civil Engineer to edit the international serial for Chinese lighthouses starting in 1872;
- First Civil Engineer to float lighthouse apparatus on mercury in Asia 1893 – Lao-Tieh-Shan in Dalian and Waglan Island in Hong Kong.

Out of the office he enjoyed horticulture, tennis and game shooting and it is believed the he introduced the flat coated retriever to China, He didn't marry until 1889 and had his only daughter in 1891.

Upon his retirement in 1898 he returned to England finally settling in Hove by the sea in East Sussex. He died in September 1923.

Keywords: David Marr Henderson, Xiyu Pagoda lighthouse, Fisher Island lighthouse

韓德善的西嶼塔燈勘測與漁翁島燈塔的設計貢獻-側論其結合文化遺產保護和文旅發展的策略

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燈塔古蹟保育研究群

摘要

清海關首任燈塔總工程師韓德善（David Marr Henderson）於台灣海峽重要航道上，擘劃現代航標建設，自 1872 年起，多次赴澎湖履勘舊「西嶼塔燈」。該閩南式建築風格的燈塔，為當時台灣海峽唯一運作之傳統航標。韓德善對其進行詳細測量與專業評估，指出設計缺陷，並提出改良方案。他亦考察塔前的天后宮之空間布局及周邊地形，綜合評估後向總稅務司赫德提交對「西嶼塔燈」的改建計畫，推動此一航標從傳統邁向現代的轉型。

透過精確測繪，韓德善獲取關鍵建築數據，為清海關購買漁翁島燈塔站建築群之土地，為新式燈塔工程奠定基礎。其設計之漁翁島燈塔，於 1875 年 12 月 20 日竣工點燈，以圓柱形鑄鐵塔體、工業革命風格的建築語彙、跨文化生活環境的設計、以及社區參與對西嶼塔燈文物的保存，成為台灣海峽傳統燈塔現代化之孤例與典範，見證十九世紀全球航海技術發展與東西文化交流。本文將解析韓德善對舊「西嶼塔燈」履勘報告和目前保存在英國土木工程師學會的手繪漁翁島燈塔建築設計圖則，並參照西班牙海格力士燈塔（Torre de Hércules，2009 年列入 UNESCO 世界文化遺產）案例，探討舊「西嶼塔燈」和漁翁島燈塔作為世界遺產之傑出普世價值，提煉具體可行之燈塔文化遺產與社區結合的保育理念與技術策略。旨在為這座照亮臺灣海峽近二百五十載之燈塔，制定永續傳承海事文化遺產之藍圖。

關鍵字：西嶼塔燈、漁翁島燈塔、韓德善、海格力士燈塔

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David Marr Henderson Architect, Civil and Mechanical Engineer, and Lighthouse Builder: From Surveys of the Xiyu Pagoda Lighthouse to designs of the Fisher Island Lighthouse

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Lighthouse Heritage Research Connections (LHRC)

Abstract

David Marr Henderson was the first chief lighthouse engineer of Qing Imperial Maritime Customs Service (IMCS). He visited Penghu several times since 1872 to study the Xiyu Pagoda Lighthouse, the only operational lighthouse in the Taiwan Strait, built in the southern Fujian architectural style. As a lighthouse expert and senior civil engineer, Henderson conducted detailed measurements and evaluations of the body of light-tower, lantern, and lamp structures, identifying design flaws and proposed suggestions for improvement. He also inspected the Tian Hou temple and surrounding properties, and after a comprehensive assessment, subsequently submitting a demolition and rebuilding plan for the Fisher Island Lighthouse Station to the Inspector General Robert Hart. modernizing this traditional lighthouse. Through sit visits with surveying, Henderson obtained essential building data, laying the groundwork for the IMCS to acquire land for the new lighthouse station and finalize architectural designs before tendering. The Fisher Island Lighthouse, a fourth-order fixed dioptric light, was exhibited on 20th December, 1875, feature a cylindrical cast iron tower body and lantern in the architectural style of Industrial Revolution. It exemplifies a collaboration of foreign and native keepers on precision lighthouse machinery, fog guns, and international maritime signaling, fostering a cross-cultural sustainable living environment, and engaging the community in preserving cultural relics of the Xiyu pagoda lighthouse. This lighthouse reflects the development of global maritime technology and cultural exchanges between East and West in the 19th century. In addition to unveiling Henderson's survey of Xiyu Pagoda Lighthouse and his design for Fisher Island Lighthouse, this article discusses the outstanding universal value of both lighthouses. It also references the Torre de Hércules Lighthouse in Spain, a UNESCO World Heritage Site since 2009, to share conservation concepts and strategies for integrating lighthouse heritage with the community engagement.

Keywords：Xiyu Pagoda lighthouse, Fisher island lighthouse, David Marr Henderson, Tower of hercules

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從「勞動股權」概念檢視石滬營造-勞動力主動介入的保存再利用替選方案

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摘要

石滬是普遍出現在有礫石或岩石碎片的海岸潮間帶中的一種透過集體營造行為方能完成的被動漁獵設施，集體營造行為中個人或家戶的勞動力投入轉以默契的形式分配獵捕的權利。這種在公共的海岸潮間帶使用在地垂手可得的構築材料，但必須要透過分揀、排列、加固、巡守、維護等勞動力的投入方能營造完成並長期持續使用的漁獵行為，在本講題中將以「勞動股權」的概念予以重新梳理；勞動力的持續投入作為參與漁獵集體行動的入股方式，也以整體勞動力的投入量對應個別家戶的勞動力付出，去推算漁獲利益的分享。

在各石滬所在的漁村已經不再單純仰賴漁獵行為維生，營造與巡守維護的勞動力投入難以持續為繼的當下，本講題將循「勞動股權」的概念嘗試提出新的主動營運對策：透過「勞動假期」形式下主動召集自願勞動力、「環境教育」推廣過程中可以被允諾並實際執行的巡守與維護任務分配，乃至於透過「環境教育」形式的集體撈捕等，期許著石滬的保存再利用可以一併延續保存石滬被營造過程中勞動力面向的集體社會默契與共識。

關鍵字：勞動股權、石滬、被動漁獵行為、社會默契

Examining the Construction of Stone Weirs from the Perspective of "Sweat-equity" –conservation and reuse alternatives with active labor involving

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Abstract

Stone weirs are passive fishing and hunting structures commonly found in intertidal zones of coastal areas where gravel or rock fragments were easily obtained. They are constructed through collective actions within indigenous people. The labor input of individuals or households is converted into the distribution of hunting rights in a tacit form. This fishing and hunting practice, which utilizes available materials in the public coastal intertidal zone, requires huge amounts of laboring for sorting, arranging, reinforcing, patrolling, and maintaining to complete and maintain its long-term sustainability. The talk will reframe this concept through the lens of "sweat-equity." The continuous input of labor serves as a way of participating in collective fishing and hunting activities, and the sharing of fish harvest benefits is calculated by corresponding the overall labor input to the labor input of individual households.

As fishing villages where stone weirs located no longer rely solely on fishing and hunting for their livelihoods, and the laboring required for construction and patrol maintenance becomes unsustainable, the talk try to explore new proactive operational strategies based on the concept of "sweat- equity": Through the active recruitment of voluntary laboring under the form of "labor holidays", the allocation of patrol and maintenance tasks that can be promised and actually carried out during the governmental promotion of "environmental education", and even collective fishing through "environmental education", it is anticipated that the preservation and reuse of the stone weir can also continue to preserve the collective social understanding and consensus of the labor force during the construction of the stone weir.

Keywords: Sweat-equity, Stone tidal weirs, Passive hunting acivities, Social understandings

澎湖水下文化資產與觀光產業的鏈接

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摘 要

澎湖擁有豐富的海洋文化，自明代以來已有眾多文獻記錄其歷史。自十六世紀以後，往來東亞海域的船舶日益頻繁，澎湖逐漸成為航海者的重要地標。然而，澎湖海域多暗礁，南北水域的水文環境差異極大，往來船舶對當地海象的陌生，使得船難事件時有所聞。

儘管如此，澎湖位處航道要衝，船隻往來無可避免，也因此累積了豐厚的歷史文化與多樣的文化資產。這些文化遺跡不僅見證了澎湖的海洋歷史，也成為今日觀光旅遊的重要資源與亮點。

如何將這些文化資產有效鏈結，並規劃出兼具知識性與吸引力的走讀旅程，是值得深思與期待的課題。若能讓旅客在欣賞文化遺產的同時，深入了解當地的歷史故事，並品嘗寓教於樂的「歷史文化餐宴」，必能為澎湖觀光帶來嶄新的體驗與價值。

關鍵字：澎湖、海洋史、觀光產業、歷史餐宴

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Linking Penghu's Underwater Cultural Heritage and Tourism Industry

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Abstract

Penghu boasts a rich maritime culture that has been recorded in numerous historical documents since the Ming dynasty. From the sixteenth century onward, as maritime traffic across East Asia intensified, Penghu emerged as an important navigational landmark. However, its surrounding waters are filled with hidden reefs, and the hydrological conditions differ greatly between the northern and southern seas. Many ships unfamiliar with these waters encountered shipwrecks in the area.

Despite the dangers, Penghu's position as a vital maritime crossroads made sea travel unavoidable. Over time, this continuous interaction gave rise to a deep maritime heritage, leaving behind diverse cultural assets that today serve as significant resources for tourism and heritage education.

The key challenge lies in how to connect these cultural assets and design heritage itineraries that are both educational and engaging. If visitors can appreciate the beauty of these sites while immersing themselves in local history—and even enjoy intellectually stimulating "historical cultural banquets"—it would provide a fresh and enriching experience, adding new dimensions of cultural depth to Penghu's tourism landscape.

Keywords：Penghu, Maritime history, Tourism industry, Historical banquet

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風浪試煉下的智慧結晶：吉貝石滬型態的演化

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摘 要

石滬的形態因其所處地而有不同的形態與演化。河流地區的原始石滬常為直線型，海濱地區則常以圓弧形態出現。關於世界各地石滬的型態演進，李明儒(2009)指出日本、韓國、台灣的石滬演進，最早的型態應該為半圓弧形，接著弧頂的石堤張開成為漏斗狀，接著再演變為奶嘴形，再來演變成目前常見的戒指形漁滬(即具備滬房的形式)。太平洋島嶼則是由基礎的弧形石堤，接著增加一條導引的結構(箭形)，再接著進化成具有封閉區與兩條引導魚游入的結構樣式(箭鏃形)。各地石滬形態上的差異主要是居民觀察魚類習性與因地制宜考量後的綜合的結果。

澎湖吉貝地區，自古便有「石滬故鄉」之稱，筆者 2024 年間的吉貝石滬清查發現，吉貝現存石滬群共有 101 口之多。關於吉貝地區石滬的型態演進，最早由陳憲明教授(1996)提出，在『澎湖群島石滬之研究』文中提到吉貝嶼石滬形態發展係由島嶼或礁岩之岸邊往海邊築堤，並發展成最早的弧形石滬。而後居民觀察到魚群有沿著岸邊或礁岩邊緣游移的特性，因此發展設計出尾端彎曲的滬堤構造(滬彎)，引導魚群於滬彎處能掉頭繼續沿滬堤內側迴游。林文鎮(2012)訪談調查記錄吉貝曾經流傳莊姓先民用馬鞍藤編成圍籬捕魚並逐漸發展出砌築石堤捕魚的歷史。

本研究利用歷史圖資、遙測影像及無人機進行吉貝石滬群調查研究，研究發現多口石滬皆有早期砌築之滬體殘跡。由殘跡之型態初步分析可知吉貝石滬的發展皆由簡單弧形石滬，經多次試誤學習(Trial-and-Error Learning)後，逐漸發展成今日所見之單滬房及多滬房型態。研究亦發現權開礁滬有類奶嘴形之型態，可能為弧形石滬與單滬房型式之過渡型態。

關鍵字：吉貝石滬、澎湖、文化景觀演化

Wind, Waves, and Knowledge: The Adaptive Design and Structural Evolution of the Jibei Stone Fish Weir

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Abstract

This study examines the morphological evolution of stone tidal weirs in Jibei, Penghu—known as the "hometown of stone weirs." Historical documents, remote sensing data, and UAV imagery were used to analyze the development of 101 existing weirs. The results indicate that Jibei's stone weirs evolved from simple arc-shaped forms into single- and multi-chamber types through trial-and-error adaptation to local coastal and ecological conditions. Morphological remnants suggest transitional "nipple-shaped" structures, representing an intermediate stage between arched and chambered types. These findings support earlier hypotheses on East Asian weir evolution (Lee, 2009; Chen, 1996) and highlight the role of environmental observation and indigenous knowledge in shaping traditional fishing landscapes.

Keywords: Jibei stone fish weirs, Penghu, Cultural landscape evolution

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石滬文化傳承與永續價值的探討-以桃園市新屋區蚵間石滬群為例

許素貞
桃園石滬協會理事

摘要

本文以石滬使用者的視角，探討石滬文化傳承下的責任與義務，以及其在地方永續發展中的轉化意義。研究以桃園市新屋區蚵間石滬群為例，該地為臺灣本島少數成功修復並仍持續使用的石滬群。自 2013 年納入全國石滬普查後，2019 年登錄為文化景觀，並由桃園石滬協會受託執行修復工作，至 2022 年完成九座石滬之修復與技術保存登錄，2023 年全數納入文化景觀範圍。近年協會以「由捕轉養」為理念，推動石滬從捕魚設施轉化為生態復育空間，並復振在地海祭與媽祖慶典。為強化生態監測與教育推廣，與知享有限公司合作開發「探搜」APP，導入數位化生態資料蒐集機制。本文藉此案例，探討地方社群如何以文化實踐回應海岸環境變遷與生態共榮的挑戰，並揭示石滬文化於當代永續發展脈絡中的價值與啟示。

關鍵字：石滬文化、文化景觀、社區參與、生態復育、永續發展

Discussion on Shihu cultural inheritance and sustainable value -Take the oyster Shihu group in Xinwu District, Taoyuan City as an example

Susan Hsu

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Abstract

From the perspective of stone tidal weirs users, this article explores the responsibilities andobligations under stone tidal weirs cultural heritage and its transformational significance in local sustainable development. The study takes the Kejian,Stone Tidal Weir Group in Xinwu District, Taoyuan City, as an example, which is one of the few stone weirs groups on Taiwan that has been successfully restored and continues to be used. Since being included in the national stone tidal weirs census in 2013, it was registered as a cultural landscape in 2019, and the Taoyuan Stone Tidal Association was entrusted with the restoration work, and by 2022, the restoration and technical preservation registration of the 9 stone tidal weirs have been completed, and all of them are included in the scope of cultural landscape in 2023. In recent years, the association has promoted the transformation of stone tidal weirs from fishing facility to an ecological restoration space, and revived the local sea festival and Mazu celebration. In order to strengthen ecological monitoring and education promotion, we cooperated with Zhixiang Co., Ltd. to develop the "Big Tan Suo" APP and introduce a digital ecological data collection mechanism. This article explores how local communities can respond to the challenges of coastal environmental change and ecological co-prosperity through cultural practices, and reveals the value and enlightenment of stone tidal weirs culture in the context of contemporary sustainable development.

Keywords: Stone tidal weirs culture, Cultural landscape, Community participation, Ecological restoration, Sustainable development

石滬保存紀錄方法回顧與數位保存技術之可能

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摘 要

外埔石滬群作為矗立於海岸的文化景觀，面對環境變遷與海岸侵蝕的挑戰，其保存投入紀錄工作已近 20 年。本文回顧歷年不同的保存紀錄方法，歸納其特性，包括與海潮破壞賽跑的維護工事與其紀錄，以及大尺度文化景觀使用 gps、空 拍等不同一般文資之紀錄方法。

另一方面，本文使用近年新拓展的數位模型掃描與建構方法，包括光達(Lidar)、數位攝影測量(Photogrammetry)、高斯潑濺(Gaussian Splatting)紀錄外埔石 滬群。呈現紀錄初步成果外，本文整理新技術之特性與國際案例，並回應石滬保 存課題超大規模與動態損壞急迫性之可能。

關鍵字:石滬、文化景觀保存、數位攝影測量法、雷達掃描、高斯潑濺

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Review of Stone Weir Preservation Documentation Methods and the Potential of Digital Preservation Technologies

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Abstract

As a cultural landscape standing against the coast, the Waipu stone weirs face significant challenges from environmental change and coastal erosion. For almost two decades, their preservation and documentation has been a continuous effort in response to these threats. This paper first reviews the various documentation methods adopted over the years, outlining their characteristics, including maintenance records from the race against tidal destruction, and the use of large-scale documentation techniques such as GPS and aerial photography, which differ from conventional heritage recording approaches. Furthermore, this study applies recently developed digital modeling and scanning methods—including LiDAR, Photogrammetry, and Gaussian Splatting—to record the Waipu stone weirs. Beyond presenting the preliminary results, this paper analyzes the features of these emerging technologies with reference to relevant international cases. In doing so, it addresses the urgent preservation issues posed by the vast scale and dynamic deterioration of the stone weirs, exploring the potential of these digital technologies to provide a viable solution.

Keywords: Stone weir, Cultural heritage Preservation, Photogrammetry, LiDAR, Gaussian splatting

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七美石斧王國～渾然天成的島嶼博物館

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摘要

七美島有著澎湖縣唯一的縣定史前石器製造場考古遺址，全島四周海岸遍佈考古遺址，因早期交通不便，没有大型建設的進駐，島嶼有如時空膠囊一般，不但很大程度保留了許多考古現象與遺留，建築、風俗、語言等有形與無形的豐富人文景觀，甚至有些人文風俗有別於澎湖其他島嶼；另外，形成於千萬年前壯觀的柱狀玄武岩海崖，不但是絕美的自然景觀，還可能是四千年前重要的石斧製作原石材，無論自然及人文，都獨樹一幟，全島有如一座活生生的博物館。

關鍵字：七美島、石斧、史前考古遺址、柱狀玄武岩、雙心石滬、頂桶盤、拜水仙門

The Kingdom of Stone Axes– Qimei Island as an Island Museum

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Abstract

The Qimei prehistoric lithic workshop sites including seven workshop sites along the coastal areas of Qimei island has been appointed as the County-designated Archaeological Sites" by the Penghu County. This group of archaeological sites are the earliest and largest prehistoric lithic workshop sites ever found in Taiwan. The Penghu archipelago's most iconic landmark " The Twin-heart stone fish weir" still been used, catch fishes and maintained. The spiritual practices such as the empowerment ritual and baishuixianmen ritual are different from other islands of Penghu archipelago. As for the natural landscape, various magnificent basaltic columns are found along the coastal areas of the Qimei Island. Most intriguingly, the location of the lithic workshops seem all correlated with those columnar basalt cliffs which may have due to the homogeneous of the columnar basalts. The Qimei Island is so rich in cultural and natural landscapes as well as archaeologically significance that its entire island could be considered an open-air museum, a living museum.

Keywords: Qimei island, Stone axes, Prehistoric archaeological sites, Columnar basalt joints, Twin-heart stone fish weir, Empowerment ritual, Baishuixianmen ritual

Photosynthesis Research for Climate Action-To Sustain Earth's Environment, Including Coral Reef Ecosystems

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Abstract

Coral reefs harbor approximately one quarter of all marine species, rendering them essential to global biodiversity, as well as to the cultural heritage and local livelihoods of coastal communities such as Penghu (1). The persistence and productivity of these ecosystems fundamentally depend on a symbiotic photosynthesis between reef-building corals and dinoflagellates (Symbiodiniaceae) living inside their cells (2). In this relationship, the coral provides inorganic nutrients (such as nitrogen compounds) to the algae, while the algae supply photosynthetic metabolites (such as sugars and amino acids) to the coral. This mutualism allows both partners to thrive in nutrient-poor waters and underpins the diversity and productivity of coral reef ecosystems.

However, global environmental change—especially rising ocean temperatures—has disrupted this symbiosis worldwide, including in Penghu. Such disturbance causes corals to lose their symbiotic algae in a process called “coral bleaching”, resulting in the whitening and death of corals and the degradation of reef ecosystems on a global scale. For photosynthetic organisms, including dinoflagellates, light is essential for energy production but also causes damage to the photosystem II (PSII) complex. Under normal conditions, damaged PSII is rapidly repaired, preserving photosynthetic capacity (3). However, under heat stress, PSII repair is inhibited, exacerbating light-induced damage and diminishing photosynthesis-a phenomenon known as “photoinhibition”. Photoinhibition in symbiotic algae is identified as a central cause of coral bleaching (4,5).

Our research aims to elucidate the detailed molecular mechanisms of PSII repair and temperature sensitivity in coral symbionts, with the goal of preventing bleaching. At the same time, enhancing the capacity of marine photosynthetic organisms to sequester atmospheric carbon dioxide is imperative for climate change mitigation. The oxygen-evolving reaction in

photosynthesis is catalyzed by the manganese (Mn) cluster in PSII, which is normally protected by extrinsic proteins. Under stress conditions, these protective proteins dissociate easily, causing instability of the Mn cluster and loss of oxygen evolution. We have discovered that certain photosynthetic organisms possess extrinsic proteins that remain stably attached to PSII even in stressful environments, maintaining photosynthetic function. These findings suggest a molecular basis for increased photosynthetic resilience to environmental extremes.

These fundamental studies have practical implications for regions like Penghu, where coral reefs sustain local ecology, livelihoods, and culture. Advances in understanding and engineering stress-resistant photosynthesis may contribute to ecosystem restoration, conservation projects, sustainable fisheries, tourism, and the preservation of cultural heritage.

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Keywords: Photosynthetic carbon assimilation, Coral bleaching, Global warming

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Whales/dolphins in Taiwan's History: A Journey from Catching to Watching and Conservation

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Abstract

Taiwan has not developed whaling until 1919 when it was colonized by Japan (1985~1945). The history of whaling development can be grouped in three stages. The first stage was during 1919~1942. The second was during 1955~1967 after WWII. The third stage was short during 1976~1980 [1].

As a whaling state, Japan conducted investigation of whale resources in southern waters of Taiwan in 1906 and found that groups of humpback whales migrated to Nanwan, a water body between two capes of the southern coast (Maobitou and Eluanbi). In 1919, a Japanese company (東洋捕鯨會社) got the permit of whaling, and introduced the Norwegian-style whaling method (harpoon cannon), which was far more efficient than traditional hand-thrown harpoons. In 1920, 29 heads were harvested and in the following years until 1942, good harvests have been recorded, including Humpback whales, blue whales, fin whales, sei whales, sperm whales, and killer whales with Humpback whales being the dominant species [2][1].

After WWII, in 1955, the government decided to resume whaling by relaxing restrictions on importing foreign boats. A Japanese boat (第一京丸號) then arrived in Kaohsiung and began whaling on March 11 in Hengchun until April 15, with Japanese skilled crew on board. Whaling continued until 1967 when catch declined and whaling was then put to an end.

While whaling in southern waters ceased, a new form of whaling with whales processed on board ventured into the Pacific during 1970s. It is noted that during 1970s, with global whale

[1] Most information of this paragraph and the following three paragraphs are excerpted from [2].

resources decreasing, International Whaling Commission (IWC) posed stringent restrictions on whaling. Against this background, Taiwan, not a member of IWC, caught the opportunity to develop whaling. However, due to pressure from the US, who expressed concerns over Taiwan's expansion of whaling activities, Taiwan imposed a ban on whaling in 1981 and Taiwan's whaling vanished into history. The historical catch of whales in Taiwan was 779 counts, 676 tons, and 450 counts (2,439 tons) for the first stage, second stage, and third stage, respectively.

While whaling vanished into history in 1981, seasonally harvesting dolphins has been seen in some local villages of Penhu. A report of 1976 documented that harvesting seasons in 沙港 were between Nov to Feb [3]. However, the catch was rarely documented.

It is noted that cetacean conservation sentiment has rose in the West in the 1970s. The pro-dolphin conservation rhetoric has also steadily increased in intensity in Taiwan. The conventional dolphin harvesting in 沙港, was broadcasted internationally in the spring of 1990, putting Taiwan under fire for the brutal, inhumane destruction of marine mammals. In facing such a high-profile environmental issue, the government took a drastic measure to protect cetacean animals by listing all of them as protected species in August 1990 [1]. With stringent regulations imposed, dolphin harvesting, a long existing activity in local villages, vanished into history.

In 1982, the IWC introduced a moratorium on commercial whaling effective from the 1985/1986 whaling season. In 1993, it adopted a first resolution on whale watching that declared its desire to encourage further development of whale watching as a sustainable use of cetacean resources [4]. These two documents reflect a growing societal awareness of conservation and non-consumptive use of cetacean resources.

Corresponding to this global paradigm shift from consumption to non-consumption of cetacean resources, Taiwan took legal measures to protect cetaceans and adopted the recreational fisheries policy in early 1990s, allowing fishing vessels to carry passengers out to sea to watch whales/dolphins and engage in other leisure activities. The high sighting rate of whale/dolphins in eastern waters of Taiwan makes whale/dolphin watching a potential business [5]. Against this background, the first whale watching trip set off on July 6, 1997 from Shiti harbor. Till now, whale/dolphin watching has become a popular leisure and marine education activity in eastern Taiwan [6].

Since all cetaceans have been listed as protected wildlife by law, conservation of whales/dolphins has become a norm for the government. Article 16 of the Act of Wildlife Conservation goes that protected wildlife (and its associated products) shall not be disturbed,

abused, hunted, killed, traded, exhibited, displayed, owned, imported, exported, raised, or bred. To further conserve a critically endangered species - Chinese White Dolphins (*Sousa chinensis taiwanensis*), the government took a more active approach by establishing a marine protected area for this species in 2020 [7]. In addition, the government has made efforts to rescue stranded marine wildlife by building Marine Wildlife Rescue Network [8]. The network facilitates and coordinates rescue and rehabilitation of wildlife, including whales, dolphins and sea turtles, etc.

In conclusion, Taiwan has gone through a journey from catching whales/dolphins to watching and conservation. This represents a paradigm shift from consumption to non-consumption of cetacean resources. It also reflects our views toward cetacean animals changed through time.

Keywords: Whaling, Whale/dolphin watching, Conservation, Marine education

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新屋石滬群及其周邊聚落之韌性評估

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摘要

新屋石滬群是台灣重要的水下文化資產，也是其周邊聚落「生活、生產、生態」實作的組成部分。然而，新屋石滬群及其周邊聚落受到各種的環境壓力和社會經濟干擾時，會直接或間接地衝擊在地居民生活生計、環境生態、傳統知識和社會互動等，進而影響新屋石滬群及其周邊聚落能否永續發展。因此，本研究以「里山里海倡議」(Satoyama-Satoumi Initiatives)核心概念「社會–生態–生產」地景與海景(Socio-Ecological Production Landscapes and Seascapes，SEPLS)架構來進行新屋石滬群及其周邊聚落之韌性評估。本研究根據評估結果描繪出新屋石滬群及其周邊聚落之韌性評估雷達圖，並分析新屋石滬群及其周邊聚落所面臨的風險和衝擊，及其可對應的資源和能力。最後，本研究將嘗試提出可能的行動方案建議。

關鍵字：新屋石滬群、里山里海倡議、「社會－生態－生產」地景與海景、韌性評估

Resilience Assessment of the Xinwu Stone Tidal Weirs and Its Surrounding Settlements

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Abstract

The Xinwu stone tidal weirs is an important underwater cultural heritage site in Taiwan and an integral part of the surrounding settlements' practices in "living, production, and ecological". However, when the Xinwu stone tidal weirs and its surrounding settlements are subjected to various environmental pressures and socio-economic disturbances, these factors can directly or indirectly affect local residents' livelihoods, environmental ecology, traditional knowledge, and social interactions. Consequently, these impacts influence the capacity for sustainable development of the Xinwu stone tidal weirs and its surrounding settlements. Therefore, this study adopts the core concept of the "Satoyama-Satoumi Initiative", namely the framework of "Socio-Ecological Production Landscapes and Seascapes" (SEPLS) framework, a core concept of the "Satoyama-Satoumi Initiative", to assess the resilience of the Xinwu stone tidal weirs and its surrounding settlements. Based on the assessment results, a resilience radar chart was constructed to illustrate the resilience characteristics of the area, followed by an analysis of the risks and impacts faced by the Xinwu stone tidal weirs and its surrounding settlements, as well as their corresponding resources and adaptive capacities. Finally, this study attempts to propose potential action strategies for future implementation.

Keywords: Xinwu stone tidal weirs, Satoyama-Satoumi Initiative, Socio-Ecological Production Landscapes and Seascapes, resilience assessment

世界遺產潛力點中的存在真實性：澎湖二崁聚落的文化旅遊研究

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摘要

原真性是旅遊研究中的重要概念，但學界多著眼於其類型的劃分，較少探討其在特定文化場域中的生成機制。本文以澎湖二崁聚落為研究對象，透過對相關文獻的整理，結合 Wang (1999)所提出的「存在原真性」理論，並援引 MacCannell (1973)與 Edensor (2001) 關於「舞台/日常」與「非展演性實踐」的觀點，探討遊客在聚落文化體驗中真實性感知的多重層次。研究資料來源於使用者生成內容(UGC)，通過獲得 Google Maps 社群媒體文本，並透過 Python 進行文本前處理與潛在狄利克雷分配(LDA)建模，以歸納遊客對二崁聚落的主要討論脈絡。進一步依循 Braun 與 Clarke (2006)的主題分析法，將量化結果與質性詮釋結合，對比存在原真性框架進行深度分析。

研究發現：二崁聚落的真實性感知呈現出多重協商的動態結構。自我的真實性體現在遊客透過身體在場與懷舊氛圍獲得的情感釋放；人際的真實性則表現在居民互動與社群參與所帶來的共在體驗；舞台與日常的辯證則折射於文化保存與觀光商業化之間的張力。此結果表明，二崁聚落的真實性並非單一類型，而是在身體實踐、語言詮釋與地方依附的交織下生成。該研究有助於深化對存在原真性層次的理解，並為傳統聚落作為世界遺產潛力點的保存與推廣提供理論支持與實務啟示，凸顯其在海洋文化遺產研究中的應用價值。

關鍵字：存在原真性、二崁聚落、LDA 主題建模、舞台與日常、世界遺產

Existential Authenticity in a World Heritage Potential Site: A Cultural Tourism Study of Erkan Settlement, Penghu

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Abstract

Authenticity is a key concept in tourism research, yet existing scholarship has largely focused on classifying its types while paying relatively little attention to the mechanisms through which authenticity is generated in specific cultural contexts. This study takes the Erkan Settlement in Penghu as its case, synthesizing relevant literature and drawing on Wang's (1999) concept of "existential authenticity," alongside MacCannell's (1973) staged/front–back regions and Edensor's (2001) notion of non-performative practices, to explore the multilayered perceptions of authenticity in cultural tourism experiences. The research data were drawn from user-generated content (UGC), including Google Maps and social media texts. Using Python, the data underwent preprocessing and were analyzed through Latent Dirichlet Allocation (LDA) modeling to identify the main discursive patterns of tourist narratives about Erkan Settlement. Subsequently, following Braun and Clarke's (2006) thematic analysis, quantitative outputs were combined with qualitative interpretation and examined against the framework of existential authenticity.

The findings reveal that authenticity in Erkan Settlement emerges as a dynamic structure of negotiation. Intrapersonal authenticity is embodied in tourists' emotional release through bodily presence and nostalgic atmospheres; interpersonal authenticity is reflected in shared experiences derived from resident interactions and community participation; while the dialectic of staged versus everyday authenticity manifests in the tension between cultural preservation and tourism commercialization. These results suggest that authenticity in Erkan Settlement is not singular but is generated through the interplay of embodied practices, linguistic interpretations, and a sense of place attachment. This study contributes to a deeper understanding of the layers of existential authenticity and offers both theoretical and practical insights into the preservation and promotion of traditional settlements as potential World Heritage sites, highlighting their significance within the research of maritime cultural heritage.

Keywords: Existential authenticity; Erkan Settlement; LDA topic modeling; Staged and everyday; World Heritage

《鏡花緣》的海洋書寫特性研究

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摘要

清代小說《鏡花緣》描繪了一個充滿奇思妙想的海外世界。小說中的海洋書寫，以《山海經》等古代神話傳說為基礎，結合社會現實加以改編，既體現了其海洋文學創作的自覺，也反映了作者對海洋的認識程度。奇幻與寫實交織的書寫特點反映出了作者對海洋有著獨特的認識，同時也保留了對海外世界的想像。

關鍵字：《鏡花緣》、海洋書寫、奇幻性、寫實性

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The Research on The Marine Writing Characteristics of "Flowers in The Mirror"

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Abstract

The Qing Dynasty novel Flowers in the mirror depicts an overseas world full of whimsy. The writing of the ocean in the novel is based on ancient myths and legends such as the Classic of Mountains and Seas, and adapted in combination with social reality, which not only reflects the consciousness of his marine literary creation, but also reflects the author's understanding of the ocean. The interweaving of fantasy and realism reflects the author's specific understanding of the sea, while also retaining his imagination of the overseas world.

Keywords: Flowers in the mirror, Marine writing, Singularity, Realism

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新得韓德善登舊西嶼塔燈的文獻記載，並比較新、舊記載的差異

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摘要

英籍燈塔工程師韓德善親自爬上舊西嶼塔燈丈量的文獻記載，見於 1875 年海關海務科（船鈔股）年度報告，引起我們更進一步瞭解舊西嶼塔燈的原始面貌。本文即就林豪《澎湖廳志》收錄三篇清代官員籌建、修護塔燈的文字記載，配合美籍史蒂瑞中文譯名《福爾摩沙及其住民》記載所見舊西嶼塔燈的文字，從：一、關於舊「塔燈」頂端燈室的「玻璃」，何時安裝？是玻璃或是牡蠣殼。二、關於舊「塔燈」的佔地及其樓層數與周圍尺寸的記載。三、關於頂樓「塔燈」的設置、周圍尺寸及光程、視野。四、韓德善對於頂樓「塔燈」所見現象的建議及改善。五、塔前的天后宮，供奉的神明及塔身上的浮雕神像。等進行比對、探討，冀能還原已消失的舊塔燈更翔實的面貌，能為爭取列世界遺產之一的努力盡一份心力。

關鍵字：西嶼塔燈、玻璃、牡蠣殼、浮雕神像

The Newly Obtained Documentary Records of Han Deshan's Ascension of The Old Xiyu Tower Lamp, and The Differences Between The New and Old Records Are Compared

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Abstract

The survey of the Xiyu Pagoda Lighthouse conducted by David Marr Henderson, documented in the 1875 annual report of the Marine Department of the Imperial Maritime Customs Service, provides valuable insights into the original appearance of the now-vanished lighthouse. This article compares the accounts of the Xiyu Pagoda Lighthouse found in Lin Hao's Penghu Gazetteer, which details designed and built in 1778 and repaired and restored in 1823 by Qing Dynasty officials, with the descriptions in the Chinese translation of Formosa and Its Inhabitants by Joseph Beal Steere, as well as Henderson's surveying record. The comparison is structured around five key points:

1. The timeline of the installation of the "glass" on the lantern at the top of the pagoda tower: Was it made of glass or oyster shells? 2. Records concerning architectural information of the Xiyu Pagoda Lighthouse, including the number of floors and surrounding dimensions. 3. The specifications regarding the installation, surrounding size, light range, and field of view of the lantern. 4. David Marr Henderson's recommendations for improving ventilation in the lantern. 5. Details about the Tian Hou temple located in front of the pagoda tower, the deities enshrined there, and the decorative sculptures attached to the pagoda. Through this analysis, we aim to reconstruct a more detailed and accurate representation of the disappeared Xiyu Pagoda Lighthouse, contributing to its potential nomination as a World Heritage Site.

Keywords: Xiyu Pagoda lighthouse, Glass, Oyster shell, Decorative sculptures

Molecular Basis of Efficient Electron Transfer Reactions Mediated by Unique Enzymes in Marine Cyanobacteria - Towards Efficient CO_2 Assimilation and Climate Change Mitigation

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Abstract

Marine photosynthetic organisms are the primary producers that form the foundation of marine ecosystems and play an indispensable role in the development of coastal fisheries as well as in the preservation of local resources and culture. Elucidating the molecular mechanisms underlying the photosynthetic reactions of these organisms is extremely important for considering effective countermeasures against climate change and for the conservation of coral reef ecosystems, such as those in Penghu. Furthermore, the activities of photosynthetic organisms contribute to carbon sequestration, organic matter production, thereby enhancing biodiversity, the carbon cycle, and the resilience of ecosystems.

In the photosynthetic reaction, electrons generated by PSI are transferred to Fd and then passed on to the enzyme ferredoxin-$NADP^+$ reductase (FNR) to produce NADPH (1). NADPH fuels carbon, nitrogen, and sulfur assimilation, making the Fd–FNR electron transfer reaction a cornerstone of organic matter synthesis in photosynthetic cells.

Traditionally, this electron transfer relies on random encounters and transient complex formation between freely diffusing Fd and FNR in the stroma, which inherently limiting efficiency. However, our research focused on a fusion-type FNR comprising a N-terminal FNR domain, and a C-terminal Fd-domain (2). Fd and FNR are covalently linked via a short peptide, allowing rapid and efficient electron transfer without reliance on diffusion. Expression and kinetic analysis in *Escherichia coli* revealed that this hybrid Fd-FNR exhibited notably higher electron transfer activity under conditions of low substrate concentration, possibly reflecting architectural or mechanistic advantages of the domain arrangement. Site-directed mutagenesis in the canonical FNR highlighted several residues critical for Fd interaction and electron transfer, providing insight into domain interface dynamics. These findings contribute to a

broader understanding of photosynthetic electron transfer in marine autotrophs, offering fundamental insights relevant to marine sustainability, climate adaptability, and the perpetuation of ocean-based cultural heritage.

Keywords: Photosynthetic carbon assimilation, Ferredoxin-NADP+ reductase, Photosystem

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澎湖民俗植物於漁業行為中的應用

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摘 要

澎湖因四面環海，東北季風強盛及土壤貧脊，但北有北淺漁場、南近台灣堆漁場，且又有黑潮支流經過，周圍漁產資源豐富，常被認為是漁業興盛而不易發展農業的地區。先民透過對環境的感知，順應四季變化，逐漸累積在地與多樣化的農漁經營方式，並在各個村落形成獨特的農漁文化。先民開拓澎湖的過程中，必有薪材、建材、放牧、漁撈等生計活動的需求，因而累積大量民俗植物的經驗。近年來，由於工業生產與商業體系的建立，使居民維持生計及資源利用方式大為改變，古老的植物利用習慣已逐漸為人所淡忘，更忽略其背後蘊含文化意義的探討。這些生活智慧大多未經文字記錄，多依靠耆老口傳或經驗傳承，如今耆老快速凋零，將加速這些寶貴文化資產流逝的危機，更凸顯民俗調查的急迫性。本文將介紹台灣灰毛豆、苧麻、高粱、馬鞍藤及薯榔等民俗植物應用於漁業行為的使用經驗，傳承前人智慧，並思考民俗植物資源永續利用的發展潛力。

關鍵字：民俗植物、漁業行為、永續利用

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The Application of Penghu Folk Plants in Fishing Activities

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Abstract

Penghu, surrounded by the sea and shaped by strong monsoons and poor soils, has often been viewed as a region suited more for fisheries than for agriculture. Yet early settlers adapted to seasonal changes and developed diverse agro-fishery practices, forming unique village cultures and accumulating rich ethnobotanical knowledge to meet daily needs such as fuel, construction, grazing, and fishing.With industrialization and commercial systems reshaping livelihoods, many traditional plant uses have been forgotten, and their cultural significance overlooked. Much of this knowledge, transmitted orally by elders, now faces the risk of disappearing as elder generations pass away, highlighting the urgency of documentation. This paper examines the traditional uses of selected ethnobotanical species—*Tephrosia obovate*, ramie (*Boehmeria nivea*), sorghum (*Sorghum bicolor*), beach morning glory (*Ipomoea pes-caprae*), and kuletu (*Dioscorea rhipogonioides*)—in fishing practices. By recording these applications, the study seeks to preserve ancestral wisdom and explore their potential for sustainable use.

Keywords: Ethnobotany, Fishing practices, Sustainable use

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從食魚教育看海洋文化的永續轉譯-以「年年有鰆」的地方實踐為例

巫佳容*

年年有鰆創辦人

摘 要

澎湖是一座與海共生的島嶼，世代以漁為生，蘊藏豐富的海洋知識與文化。然而，隨著產業結構轉變與青年外流，許多與海相關的生活智慧正逐漸被遺忘。「年年有鰆」自 2020 年成立以來，致力以「吃魚」為起點，讓更多人從餐桌重新認識海洋，理解漁業與生活的連結。本發表將以行動實例分享如何透過「食魚教育」實現海洋文化的當代轉譯。我們從漁村現場出發，將魚市場導覽、魚種知識、漁法介紹與成熟體長等科普內容轉化為可體驗、可互動的教育形式，並結合商品開發與體驗設計，建立「環境 × 產業 × 青年」共好的商業模式。同時，透過魚骨與下雜魚等漁業副產物再利用，開發出兼具環保與文化意涵的永續商品，實踐全魚利用的理念。

這些實踐回應了「文化如何延續」、「教育如何行動化」以及「在地如何實踐可持續的產業模式」等課題。年年有鰆以社會企業的方式將教育與市場結合，讓文化價值專換為商業模式，使在地產業轉型同時促進知識傳承與青年投入。透過這樣的方式，我們不僅保存傳統，也創造了新的交流語言，讓居民、孩子與旅人都能在「吃魚」的過程中理解海洋永續的精神。本發表希望分享離島社會如何從生活出發，建立屬於自己的文化教育與產業發展模式，並透過地方行動者的經驗，展現海洋文化的韌性與可能性。

關鍵字：食魚教育、海洋文化、地方創生、永續產業模式、社會創新

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Translating Marine Culture through Fish Education: The Case of "Fish Says" in Penghu

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Founder of Fish Says

Abstract

Penghu is an island that lives in harmony with the sea. For generations, its people have relied on fishing, nurturing a rich body of maritime knowledge and culture. However, as industrial structures shift and young people move away, much of the ocean-related wisdom rooted in daily life is gradually disappearing. Since its founding in 2020, Fish Says has been dedicated to reconnecting people with the ocean through the act of eating fish—inviting them to rediscover the connections between fisheries, daily life, and the marine environment. This presentation shares practical examples of how Fish Says translates marine culture into contemporary practice through fish education. Starting from the fishing villages, the team transforms elements such as fish market tours, fish species knowledge, fishing methods, and the concept of maturity length into experiential and interactive educational activities. By integrating product development and experiential design, Fish Says has established a collaborative business model that benefits the environment, local industries, and young people. Meanwhile, by reusing fish bones and bycatch to create sustainable products with both environmental and cultural significance, the initiative embodies the principle of whole-fish utilization.

These practices address questions such as how culture can be sustained, how education can take action, and how sustainable industry models can be locally implemented. As a social enterprise, Fish Says combines education with the market, transforming cultural values into viable business models that drive local industrial transformation while promoting knowledge transmission and youth participation. Through this approach, we not only preserve tradition but also create new forms of dialogue, allowing residents, children, and travelers to understand the spirit of ocean sustainability through the simple act of eating fish. This presentation aims to share how island communities can start from everyday life to build their own models of cultural education and industrial development, and how local practitioners can demonstrate the resilience and transformative potential of marine culture.

Keywords：Fish education, Marine culture, Local revitalization, Sustainable industry model, Social innovation

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