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## **Fuh-Kwo (Frank) Shiah (夏復國)**

Research Center for Environmental Changes (RCEC), Academia Sinica

No. 128, Sec. 2, Academia Rd., Nankang, Taipei, Taiwan 115

Office Tel: +886-2-2783-9910 ext. 271

Mobile: 0970-045-807

Email: [fkshiah@rcec.sinica.edu.tw](mailto:fkshiah@rcec.sinica.edu.tw)

Lab website link:

### **EDUCATION**

1988/09 – 1993/08 Ph.D. Marine, Estuary and Environ. Science Program, U of Maryland,  
College Park, USA

1984/09 – 1986/08 M.S. Institute of Marine Biology, National Sun-Yat-Sen U, Taiwan

1976/09 – 1981/08 B.A. Depart. of Biology, National Taiwan Normal U, Taiwan

### **EMPLOYMENT**

2004/08 - present Research Fellow RCEC, Academia Sinica, Taiwan

2005/08 - present Professor (joint appoint.) Inst. Mar. Environ Ecol, Natl Taiwan Ocean U.

2007/08 - present Professor (joint appoint.) Inst. Oceanography Natl Taiwan U.

2007/08 - 2012/07 Associate professor Inst. Oceanography Natl Taiwan U.

2001/08 - 2007/07 Assistant Professor Inst. Oceanography Natl Taiwan U.

### **HONORS & AWARDS**

2001 MOST-Taiwan the distinguish research award

2001 National Taiwan Univ. Young scholar award

1992 Univ. Maryland HPL MEERC research scholarship. 1992.09-1993.08.

1987 Ministry of Education-ROC government scholarship. 1988.09 - 1991.08.

### **PROFESSIONAL SERVICE**

➤ Journal editors: Associate editor of *Terrestrial, Atmospheric and Oceanic Sciences*

### **RESEARCH INTEREST**

My research lies in the fields of limnology and oceanography. I am interested in studying (1) the growth controlling mechanisms of planktons (heterotrophic bacterioplankton, phytoplankton, protozoan and viruses) and their eco-linkages in freshwater (the Fei-Tsuei reservoir) and marine (the East China Sea, South China Sea and the NW Pacific) ecosystems; (2) the planktonic and ecosystem responses (ratio of primary production to community respiration) to external physical and chemical (inorganic nutrients, organic substrate) forcing induced by episodic events such as typhoons, internal waves... etc., and (3) the operation and management of decadal time-series biogeochemical observatory studies including the SEATS project in the South China Sea and the T-WEBS project in

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Fei-Tsuei reservoir in northern Taiwan.

## RESEARCH HIGHLIGHTS

### 1. Phytoplankton response to episodic climatic disturbances in freshwater ecosystem: a decadal analysis

Episodic climatic disturbances are projected to have intense magnitude and inconsistent frequency under 21<sup>st</sup> century climate change. Through field observations of a total 36 typhoon cases in a subtropical deep freshwater ecosystem in the period of 2005-2014. Phytoplankton exposed to typhoon disturbances generally exhibited an increasing trend over the weeks before, during and after typhoons in summer but varied in autumn. The correlations and multivariate regressions showed different contributions of meteorological and hydrological variables to individual phytoplankton responses before, during and after typhoons between seasons.

Reference: Kao et al., 2017.

### 2. Internal solitary waves enhance bacteria growth in the South China Sea

Nine anchored studies were conducted from 2009~2012 in the South China Sea with different physical conditions. For the first time, our results indicated that the maxima of bacterial production and growth rate of the elevation IWs areas were ~5-folds higher than those of the Control sites. Surveys conducted at the NW area of the Dongsha atoll suggested that bacterial activities may be a function of the lunar fortnightly (14-day) cycle. Enrichment experiments suggested more directly that the limiting inorganic nutrients introduced by the elevation IWs may contribute higher bacterial activities within the euphotic zone.

Reference: Chen et al., 2016.

## REPRESENTATIVE PUBLICATIONS (\*: corresponding author)

1. **Shiah FK** and HW Ducklow. 1994. Temperature and substrate regulation of bacterial abundance, production and specific growth rate in temperate estuarine ecosystems. *Mar. Ecol. Prog. Ser.* **103**: 297-308.
2. **Shiah FK** and HW Ducklow. 1994a. Temperature regulation of heterotrophic bacterioplankton biomass, production and specific growth rate in the Chesapeake Bay. *Limnol. Oceanogr.* **39(6)**: 1243-1258.
3. **Shiah FK** and HW Ducklow. 1995. Multi-scale variability of bacterioplankton abundance, production and specific growth rate in a temperate salt marsh tidal creek. *Limnol. Oceanogr.* **40(1)**: 55-66.
4. **Shiah FK** and HW Ducklow. 1995a. Regulation of bacterioplankton abundance and growth rate by substrate supply and bacterivory: a mesocosm study. *Microb. Ecol.* **30**: 239-255.
5. **Shiah FK** and HW Ducklow. 1997. Bacterioplankton growth responses to temperature and chlorophyll variations in estuaries measured by thymidine:leucine incorporation ratio. *Aquat. Microb. Ecol.* **13**: 151-159.
6. **Shiah FK**. 1999. Diel cycles of heterotrophic bacterioplankton abundance and production in the ocean surface waters. *Aquat. Microb. Ecol.* **17(3)**: 239-246.
7. **Shiah FK**, GC Gong and KK Liu. 1999. Temperature vs. substrate limitation of heterotrophic bacterioplankton production across trophic and temperature gradient in the East China Sea. *Aquat. Microb. Ecol.* **17(3)**: 247-254.

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8. **Shiah FK**, KK Liu, SJ Kao and GC Gong. 2000a. The coupling of bacterial production and hydrography in the southern East China Sea: Spatial patterns in spring and fall. *Cont. Shelf Res.* 20 (4-5): 459-477.
9. **Shiah FK**, SY Chung, SJ Kao, GC Gong and KK Liu. 2000b. Biological and hydrographical responses to tropical cyclones (typhoons) in the continental shelf of the Taiwan Strait. *Cont. Shelf Res.* 20: 1-16.
10. **Shiah FK**, GC Gong, TY Chen and CC Chen. 2000c. Temperature dependence of bacterial specific growth rates on the continental shelf of the East China Sea and its potential application in estimating bacterial production. *Aquat. Microb. Ecol.* 22 (2): 155-162.
11. **Shiah FK**, TY Chen, GC Gong, CC Chen, KP Chiang and JJ Hung. 2001. Differential coupling of bacterial and primary production in mesotrophic and oligotrophic systems of the East China Sea. *Aquat. Microb. Ecol.* 23 (3):273-282.
12. **Shiah FK**, GC Gong and CC Chen. 2003. Seasonal and spatial variation of bacterial production in the continental shelf of the East China Sea: a synthesis of controlling mechanisms and potential roles in carbon cycling. *Deep-Sea Res. II* 50 (6-7):1295 – 1309.
13. **Shiah FK**, TH Wu, KY Li, SJ Kao, YF Tseng, JL Chung and S. Jan. 2006. Thermal effects on heterotrophic processes in a coastal ecosystem adjacent to nuclear power plant. *Mar. Ecol. Prog. Ser.* 39: 55-65. (SCI).
14. **Shiah FK**, GC Gong and T Xiao. 2006. Effects of ChangJiang River summer discharge on the bottom-up control processes of shelf bacterial growth. *Aquat. Microb. Ecol.* 44:105-113.
15. Tseng YF, TC Hsu, YL Chen, SJ Kao, JT Wu, JC Lu, JC Lai, HY Kuo, CH Lin, Y. Yamamoto, T. Xiao and **FK Shiah\***. 2010. Typhoon effects on DOC dynamics in a phosphate-limited reservoir. *Aquat. Microb. Ecol.* 60:247-260. doi: 10.3354.
16. Lai CC, YW Fu, HB Liu, HY Kuo, KW Wang, CH Lin, JH Tai, GTF Wong, KY Lee, TY Chen, Y Yamamoto, MF Chow, Y Kobayashi, CY Ko and **FK Shiah\***. 2014. Distinct bacterial production–DOC–primary production relationships and implications for biogenic C cycling in the South China Sea shelf. *Biogeosciences*, **11**:1-10. Doi:10.5194/bg-11-12014.
17. Ko CY, CC Lai, TY Chen, HH Hsu and **FK Shiah\***. 2015. Typhoon effects on phytoplankton responses in a semi-closed freshwater ecosystem. *Marine and Freshwater Research*. [http://dx.doi.org/10.1071 /MF14294](http://dx.doi.org/10.1071/MF14294).
18. Chen TY, JH Tai, CY Ko, CC Chen, CH Hsieh, NZ Jiao, HB Liu and **FK Shiah\***. 2016. Nutrient pulses driven by internal solitary waves enhance heterotrophic bacteria growth in the South China Sea. *Environmental Microbiology*. DOI: 10.1111/1462-2920.13273.
19. Ko CY, CC Lai, HH Hsu, **FK Shiah\***. 2017. Decadal phytoplankton dynamics in response to episodic climatic disturbances in a subtropical deep freshwater ecosystem. *Water Research* 109: 102-113.
20. Okuda N, Y Sakai, K Fukumori, SM Yang, CH Hsieh, **FK Shiah\***. 2017. Food-web properties of the recently constructed, deep subtropical Fei-Tsui Reservoir. *Hydrobiologia* 802 (1): 199–210.