

This is RCEC website cv template. Please follow the format as much as possible. No more than 5 pages.

## **Chao-Chen Lai (賴昭成)**

Research Center for Environmental Changes (RCEC), Academia Sinica

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

Office Tel: [+886-2-2787-5854](tel:+886227875854)

Email: [ccjosephlai@gate.sinica.edu.tw](mailto:ccjosephlai@gate.sinica.edu.tw)

Lab website link: [www.rcec.edu.tw](http://www.rcec.edu.tw)

### **EDUCATION**

2006/09 – 2017/02 Ph.D. Institute of Oceanology, National Taiwan University, Taiwan

2002/09 – 2004/06 M.S. Institute of Oceanology, National Taiwan University, Taiwan

1998/09 – 2002/06 B.A. Depart. of Earth Science, National Taiwan Normal University, Taiwan

### **EMPLOYMENT**

2017/03 - present Postdoc Research Fellow RCEC, Academia Sinica, Taiwan

### **RESEARCH INTEREST**

- Aquatic Microbial Ecology
- Impact of episodic climate events on ecological functions
- Carbon balance in ecosystem

### **RESEARCH HIGHLIGHTS**

#### **Typhoon effects on phytoplankton responses in subtropical freshwater ecosystem**

Through decadal field observations of phytoplankton biomass, production and growth rate in 36 typhoon cases, we found that 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. The post-typhoon weeks were especially important for the timeline of phytoplankton increases and with a detectable seasonal variation that the chlorophyll a concentration significantly increased in autumn whereas both primary production and growth rate were associated with significant changes in summer. Additionally, phytoplankton responses during the post-typhoon weeks were significantly different between discrete or continuous types of typhoon events.

#### **Biogenic C cycling in the South China Sea shelf**

Based on two summer spatio-temporal data sets obtained from the northern South China Sea shelf and basin, our study reveals contrasting relationships among bacterial production (BP), dissolved organic (DOC) and primary production (PP) in the transition zone from the neritic to the oceanic

**This is RCEC website cv template. Please follow the format as much as possible. No more than 5 pages.**

regions. Inside the mid-shelf (bottom depth <100 m), where inorganic nutrient supplies from river discharge and internal waves were potentially abundant, BP, DOC and PP were positively intercorrelated, whereas these three measurements became uncorrelated in the oligotrophic outer shelf and slope. We suggest that the availability of limiting minerals could affect the couplings/decouplings between the source (i.e. phytoplankton) and sink (i.e. bacteria) of organic carbon, and thus DOC dynamics. DOC turnover times were homogeneously low (37–60 days) inside the mid-shelf area and then increased significantly to values >100 days in the outer shelf, indicating that riverine (Pearl River) DOC might be more labile.

**REPRESENTATIVE PUBLICATIONS** (\*: corresponding author)

1. T.Y. Chen\*, **C.C. Lai**, F.K. Shiah, G.C. Gong\* (Under Review) Dissolved and particulate primary production and subsequent bacterial C consumption in the southern East China Sea of the NW Pacific. *Frontiers in Marine Science*, section Marine Biogeochemistry
2. E.S. Austria, **C.C. Lai**, C.Y. Ko, K.Y. Lee, H.Y. Kuo, T.Y. Chen, J.H. Tai, F.K. Shiah\* (2018) Growth-controlling mechanisms on heterotrophic bacteria in the South China Sea shelf: Summer and Winter patterns. *Terrestrial, Atmospheric & Oceanic Sciences* 29 (4).
3. C.Y. Ko, **C.C. Lai**, H.H. Hsu, F.K. Shiah\* (2017) Decadal phytoplankton dynamics in response to episodic climatic disturbances in a subtropical deep freshwater ecosystem *Water research* 109, 102-113.
4. M.F. Chow, **C.C. Lai**, H.Y. Kuo, C.H. Lin, T.Y. Chen, F.K. Shiah\* (2017) Long Term Trends and Dynamics of Dissolved Organic Carbon (DOC) in a Subtropical Reservoir Basin. *Water* 9 (7), 545.
5. C.Y. Ko, **C.C. Lai**, H.H. Hsu, F.K. Shiah\* (2016) Typhoon effects on phytoplankton responses in a semi-closed freshwater ecosystem. *Marine and Freshwater Research* 67:546-555
6. **C.C. Lai**, Y.W. Fu, H.B. Liu, H.Y. Kuo, K.W. Wang, C.H. Lin, J.H. Tai, G.T.F. Wong, K.Y. Lee, T.Y. Chen, Y. Yamamoto, M.F. Chow, Y. Kobayashi, C.Y. Ko, F.K. Shiah\* (2014) Distinct bacterial-production–DOC–primary-production relationships and implications for biogenic C cycling in the South China Sea shelf. *Biogeosciences* 11:147-156
7. Y.F. Tseng, T.C. Hsu, Y.L. Chen, S.J. Kao, J.T. Wu, J.C. Lu, **C.C. Lai**, H.Y. Kuo, C.H. Lin, Y. Yamamoto, T.A. Xiao, F.K. Shiah\* (2010) Typhoon effects on DOC dynamics in a phosphate-limited reservoir. *Aquatic Microbial Ecology* 60:247-260