Surface Ocean – Lower Atmosphere Study  
Linking ocean-atmosphere interactions with climate and people

Contact: Minhan Dai & Huiwang Gao (China-SOLAS); Véronique Garçon (SOLAS SSC Chair), Emilie Brevière (SOLAS International Project Office) solas@geomar.de / www.solas-int.org

**Surface Ocean - Lower Atmosphere Study (SOLAS)**
- International research initiative
- Over 2400 scientists in over 75 countries
- International Project Office (IPO) located at GEOMAR Kiel, Germany
- Understanding the key biogeochemical-physical interactions and feedbacks between the ocean and atmosphere
- Major challenges ahead that require coordinated research by ocean and atmospheric scientists with growing engagement from scientists of social sciences and stakeholders
- First synthesis: Open access book by Liss & Johnson 2014 and article in Anthropocene journal by Brevière et al. 2015

**SOLAS Planned Events**
- San Diego, USA 3-5 April 2017, Combined effort by SOLAS & CliC to promote sea-ice biogeochemistry
- Cargese, France 15-19 May 2017, Air-sea interface and fluxes of mass and energy
- Cargese, France, 23 July -3 August 2018, SOLAS summer School

**Projects**
- **SOLAS endorsed project**
  Choice-C I: Carbon Cycling in China Seas-budget, controls and ocean acidification (2009-2013), leading PI: Minhan Dai
  - **Choice-C II**: Carbon Cycle in South China Sea -budget, controls and global implications (2015-2019), leading PI: Minhan Dai
- Atmospheric deposition and its impact on marine primary production and nitrogen cycle (2014-2018), leading PI: Huiwang Gao
- Biogeochemical processes and climate effect of marine biogenic trace gases in the east marginal seas of China (2016-2021), leading PI: Gui-Peng Yang

**China SOLAS Activities**

**Workshops**
- SOLAS Open Science Conference, Mar. 6-9, 2007, State Key Laboratory of Marine Environmental Science (MEL), Xiamen University, Xiamen
- The changing carbon cycle of North Pacific continental shelves and marginal seas, PICES 2013 Annual Meeting (Conveners: Sophia Johannessen, Dong-Jin Kang & Minhan Dai)
- Ocean Acidification research in China: an international workshop, Shanghai, China, April 28-29, 2016
- Special Session (either on carbon or SOLAS) in AOGS Annual Assembly
- SOLAS in Asia: A Future SOLAS Symposium, Qingdao, China, Oct. 27-28, 2016

**Future Earth Ocean Knowledge Action Network**
- Involvement in the development team
- Three topics where SOLAS involvement could be beneficial:
  1. Extreme events in Eastern Boundary Upwelling Systems
  2. Changes in the Arctic: Threat or opportunity?
  3. Environmental services: Volcanic emissions

**SOLAS within Future Earth & Ocean KAN**
- Linkage of earth system science to societal needs and socio economics
- Crosscutting theme ‘SOLAS Science and Society’ and ‘SOLAS research into environmental impacts of geoengineering’

**Future Earth proposed Research Themes**
- Transformation towards Sustainability
- Global Development
- Dynamic Planet

**Capacity building**
6th International SOLAS summer School Xiamen, China, 23 Aug. - 2 Sep.2013
- The IAEA/OA-ICC Training Course on Best Practices in Ocean Acidification Research Xiamen, China, 19-23 Oct.2015

**Plans for future projects**
- Land- and Ship- based Atmospheric Observation Platforms
- Donghai Station
- R/V with Mobile Platform

A new research vessel with the capacity of SOLAS and trace metal researches is under construction

**Linkage of SOLAS Science Plan**
- ‘Themes of importance for SOLAS research over the next decade have become ‘core themes’ of the new Science Plan. SOLAS 2015-2025: Science Plan and Organisation – Linking ocean-atmosphere interactions with climate and people

**Interactions between the 5 SOLAS science core themes**

**SOLAS project & IPO sponsors:**
- [IAEA](https://iaea.org)
- [ CliC](https://clic.nilu.no)
- [Future Earth](https://www.future-earth.org)
- [MEOSAR](https://www.meosar.org)
- [WCRP](https://www.wcrp-oceans.org)
- [SCOR](https://www.scor.org)
- [GEOMAR](https://www.geomar.de/en)
- [FAO](https://www.fao.org)
- [GEBCO](https://www.gebco.net)
- [SIO](https://sio.ucsd.edu)
- [GODAE](https://www.godae.org)
- [NOAA](https://www.noaa.gov)
- [SAMS](https://www.sams.no)
- [OGMOS](https://www.ogmos-project.org)
- [GEO](https://www.geneva这份文档是一篇关于“Surface Ocean – Lower Atmosphere Study”（SOLAS）的研究综述，主要内容包括国际研究项目、目标、气候-海洋-大气相互作用等。文中提到了SOLAS的愿景、科学计划和组织结构以及未来的研究方向。此外，还列出了SOLAS的计划事件、项目、活动和赞助方。