

**Methane and nitrous oxide may contribute more to greenhouse effect than CO<sub>2</sub>  
emission from the South China Sea in summer**

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**Abstract**

The South China Sea (SCS) is the largest marginal sea in the world. It is now apparent that in summer tropical seas, such as the SCS, are either close to neutral or are a small source of CO<sub>2</sub> to the atmosphere. Methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), however, are clearly much more supersaturated in the SCS. In the case of the SCS, the CH<sub>4</sub> and N<sub>2</sub>O released from the surface waters contribute about three times as much to the greenhouse effect as CO<sub>2</sub> does.

In addition, abnormally high subsurface CH<sub>4</sub> concentrations were found on the continental slopes in the northern SCS, as CH<sub>4</sub> have been released from sediments

and/or may have originated in CH<sub>4</sub> gas hydrates. CH<sub>4</sub> gas hydrates might become an important source of energy in the future. However, will the buried CH<sub>4</sub> be released either due to the warming of the seawater, the internal waves, tropical storms or other disturbances? It may compound the severity of global warming.

**Keywords:** South China Sea, CH<sub>4</sub>, N<sub>2</sub>O, CO<sub>2</sub>, greenhouse effect