

## Isotopic Character and Ages of Particulate and Dissolved Organic Carbon (POC, DOC) in the Huanghe River, China

YUEJUN XUE<sup>1</sup>, CAILIXU<sup>1</sup>, CHUNLE LUO<sup>1</sup> AND XUCHEN WANG<sup>1,2</sup>

<sup>1</sup> Key Laboratory of Marine Chemistry Theory and Technology, Ministry of Education, Ocean University of China, Qingdao 266100, China

<sup>2</sup> Qingdao Collaborative Innovation Center of Marine Science and Technology, Qingdao 266100, China

One-year studies were conducted in 2015 using radiocarbon as a tool to investigate the sources and fluxes of dissolved (DOC) and particulate organic carbon (POC) transported in the Huanghe (Yellow River), the second largest river in China. The riverine DOC and POC showed very different  $\Delta^{14}\text{C}$  signatures along the river drainage basin from the headwater to the estuary. The values of  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  ranged from -24.7‰ to -28.8‰, and -57.9‰ to -221‰ for DOC; -23.0‰ to -24.1‰ and -249‰ to -613‰ for POC, respectively. The calculated radiocarbon ages indicate that POC was much older (2,240 to 7,550 yr. before present) than DOC (415 to 1,950 yr.) along the river. Using a dual isotopic model, we estimated that pre-aged soil and fossil organic matter were the major sources contributing 52-69% and 16-45% OC to the Huanghe POC. And pre-aged soil and plant biomass were the dominant sources, contributing 28-77% and 14-55% OC to the riverine DOC, respectively. Monthly measurements of both DOC and POC concentrations and flux calculation indicate that in 2015, the Huanghe River delivered  $3.1 \times 10^{10}$  g DOC and  $4.8 \times 10^{10}$  g POC into the Bohai Sea. This large amount of aged terrestrial OC represents a significant fraction of organic matter being buried in the marginal sea sediment and cycled in the coastal waters.