

Paper Number: 3956

A Study on Quaternary Geological Characteristics and Land Subsidence Life Process in the Lower Yangtze Delta Area of China

Jiang,H.T.¹, Wu,J.H.², Gu,K.³, and Shi,B.⁴

¹School of Geographic and Oceanographic Sciences, Nanjing University, Nanjing, 210046, China ,
Jianghongtao@nju.edu.cn

²School of Earth Sciences and Engineering, Nanjing University, Nanjing, 210046, China

³School of Earth Sciences and Engineering, Nanjing University, Nanjing, 210046, China

⁴School of Earth Sciences and Engineering, Nanjing University, Nanjing, 210046, China

Land subsidence is the most critical geological problem in the Lower Yangtze Delta Area of China, which influences the development of economy. In this paper, the land subsidence is considered as a life process. Based on the analysis of over 150 drill cores from this area, the Quaternary geological characteristics are revealed and the aquifer groups are defined. From the structural characteristics of the Quaternary deposits, including pore distribution, structural linking modes and physico-chemical properties, the structural changes of the deposits at the different phases of land subsidence are studied; the relationship between the land subsidence and ground water exploitation is further analyzed. The variation rules of physical properties of soils and structure with the increasing depth are studied on the basis of a large number of soil sample tests and macro-microstructure analysis. The relationships among compressive deformation of the clay layer, microstructure and land subsidence is analyzed. Finally, an evaluation method for soil layer compression is proposed. The results show that the moisture content, porosity and compressibility of soils get smaller and the microstructure orientation becomes more clear with an increase in depth. This research is significant for studying the development mechanism of Quaternary strata in this subsidence area and for the assessment of subsidence life process.

References:

- [1] Qiu, Z (1992) Environmental Protection 10: 35–36
- [2] Jiang,H.T (2003) Scientia Geographica Sinica 23(1): 82–86
- [3] Jiang,H.T (1995) Hydrogeology and Engineering Geology 22(3): 35–37
- [4] Wang,G.Y (2009) Geology and Prospecting 45(5): 612–620

