

Impacts of Anthropogenic Aerosols on Regional Climate Changes

SHAW CHEN LIU¹

¹*Research Center for Environmental Changes, Academia Sinica, Taiwan*

In this work the salient features of climate changes observed in Taiwan (and in certain cases in China) and their possible causes are examined with emphasis on the roles of anthropogenic aerosols. We have found two significant changes in climate parameters that are likely caused by anthropogenic aerosols. The first is that the average yearly sunshine duration has decreased by about 15% since 1970's. The other change that has occurred around the same time period is a significant decreasing trend in light precipitation (< 5 mm/hr). We will show evidences that suggest the indirect effect of aerosols, i.e. the effect through aerosols acting as cloud condensation nuclei, is a major cause of both changes. Specifically, a highly likely cause of the reduction in sunshine duration is an increase in synoptic scale clouds and/or cloud albedo as a result of increased anthropogenic aerosols over Asia. The specific mechanism through which anthropogenic aerosols contribute to the decreasing trend in light precipitation is poorly understood. Moreover, other factors and/or processes, e.g. land-use changes may also play a non-negligible role.