

Seasonal Sewers

Kevin L. Enfinger and Patrick L. Stevens

sew·ēr sō-ci-ol'ō-gy, the science of society, social institutions, and social relationships viewed through the eyes of a sewer; specifically, the systematic study of the development, structure, interaction, and collective sewer use of organized groups of human beings.

McMurdo Station is the primary logistics and support station for research activities in Antarctica. Managed by the U.S. National Science Foundation Office of Polar Programs and operated by Raytheon Polar Services (Centennial, Colo.), this station supports scientific research in one of the most formidable climates in the world, with extreme daylight, extreme darkness, and extreme cold. As a result, operations at McMurdo Station are seasonally driven and weather-dependent.

The figure (below) shows a summary of daily life at McMurdo Station observed during 2009. The number of daylight hours, average temperature, population, and wastewater generation for each day of the year are illustrated. During winter – which is summer in the Northern Hemisphere – only about 150 people remain at McMurdo. During this period,



Dominick Dirksen/National Science Foundation

temperatures dip down to -45°C (-49°F), and constant darkness prevails. During summer, the population swells to about 1200, the high temperature can reach up to 5°C (41°F), and it is constantly light outside.

Composite hydrographs of daily sewer use during three different seasons – winter, summer, and winfly – are also shown in the figure. (Winfly is a transitional period between winter and summer when additional support staff arrive to ramp up operations and prepare for the

summer season.) Weekdays (Monday through Saturday) are plotted in green, and weekends (Sundays) are plotted in blue. Note that the shape of the sewer use pattern remains constant across the seasons but varies in magnitude as a function of population at the station. Per-capita sewer use ranges from 190 to 265 L (50 to 70 gal) per person per day, depending on the season.

Despite its remote location and challenging environment, the familiar rhythms of daily life are still found at McMurdo Station, as revealed in its sewer use patterns. At its heart, McMurdo Station is a community of ordinary people bound by a common purpose to accomplish extraordinary things in an extraordinary place.

Kevin L. Enfinger is senior project engineer, and **Patrick L. Stevens** is vice president of engineering at ADS Environmental Services, a division of ADS LLC (Huntsville, Ala.).

Special thanks to Nathan Biletnikoff and Kelly Jacques of Raytheon Polar Services (Centennial, Colo.) for their gracious cooperation and assistance. Their support is greatly appreciated.

A glimpse into life at McMurdo Station, Antarctica – through the eyes of a sewer

