26. CLIMATE AND METEOROLOGY

26.1 Introduction

The objective of the meteorological data-collection program for the Cook Inlet drainages study area was to collect representative meteorological surface data in accordance with the guidance provided for Prevention of Significant Deterioration (PSD) air quality permit requirements for the Cook Inlet study area. Meteorological monitoring stations were installed at three locations in the Cook Inlet study area: at Port Site 1 near Knoll Head (Knoll Head/Port Site 1) on the western side of the entrance to Iniskin Bay, at Williamsport on the west side of upper Iliamna Bay, and at North Head on the northern side of the entrance of Iliamna Bay (Figure 26-1). Meteorological data presented in the EBD cover the following data-collection periods: Knoll Head/Port Site 1—August 1, 2005 through December 31, 2008; Williamsport and North Head—January 1, 2008 through December 31, 2008.

The scope of work for the meteorological study in the Cook Inlet study area is to measure and report the following meteorological parameters:

- Wind speed.
- Wind direction.
- Wind direction standard deviation (sigma-theta).
- Temperature.
- Precipitation.
- Evaporation.

Precipitation and evaporation were observed only at the Knoll/Head/Port Site 1 meteorological station, and those measurements are considered representative of the entire Cook Inlet study area.

26.2 Results and Discussion

The wind direction in Iniskin Bay at the Knoll Head/Port Site 1 station is generally from the north and northeast because of local terrain influences. The wind direction in Iliamna Bay at Williamsport is generally from the west because of slope-drainage influences from the mountains. The wind direction for North Head is generally from the northwest because of westerly winds being influenced by the nearby mountains. No hourly mean calm winds were observed in the Cook Inlet study area. The highest maximum hourly mean wind speeds were observed at the North Head station (29.3 meters per second or 65.5 miles per hour) in February 2008.

Daily mean temperatures in the Cook Inlet study area ranged from a minimum of -25.2ºC (-13.4°F) at Williamsport in January, 2008 to a maximum of 20.3°C (68.5°F) at Knoll Head/Port Site 1 in June, 2007. Temperatures are moderated by the cool open waters of Iniskin and Iliamna bays.

Precipitation monitoring began at the Knoll Head/Port Site 1 station on July 15, 2008 and is ongoing. The highest total monthly precipitation recorded through the 2008 study period was 370.8 millimeters (14.6 inches) in September 2008; the lowest total monthly precipitation was 45.5 millimeters (0.5 inches) in October, 2008. Evaporation monitoring began at Knoll Head/Port Site 1 in July 2008 and stopped in October, 2008 for the winter. Although the July monitoring did not begin until July 15, it produced the highest total monthly evaporation recorded during this study period: 50.6 millimeters (2.0 inches).

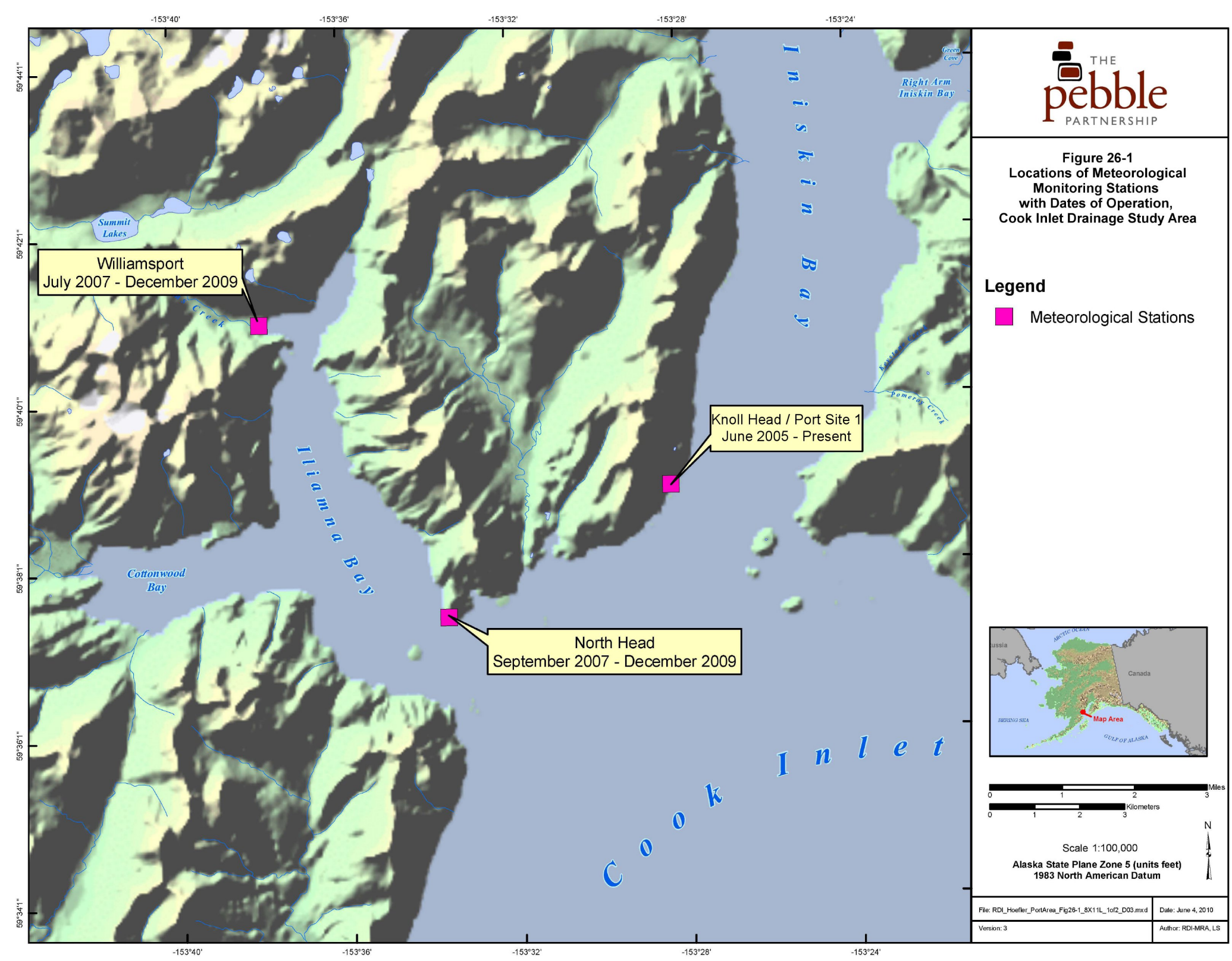
The climate in the study area is transitional, with a strong maritime influence because of its proximity to Cook Inlet. Summer temperatures are moderated by the open waters of Iniskin Bay, Iliamna Bay, and Cook Inlet. Winter temperatures are more continental because of ice accumulation in Iniskin Bay and Iliamna Bay. Weather systems typically travel into the region from the Bering Sea to the west, from along the Aleutian Island chain to the southwest, and from the Gulf of Alaska to the south. Depending on the season, these weather systems consist of cool to cold air that is saturated with moisture, resulting in frequent clouds, rain, and snow. Less frequent wintertime incursions of frigid, stable arctic air masses bring shorter periods of clear, but very cold, conditions to the region. In the summer, incursions of very warm air masses from interior Alaska can cause atmospheric instability that result in cumulus cloud development and occasional thunderstorm activity.

Knoll Head/Port Site 1 meteorological monitoring station in the Cook Inlet drainages study area, March 2006

Knoll Head/Port Site 1 anemometers in the Cook Inlet drainages study area, June 2005

Knoll Head/Port Site 1 meteorological monitoring station in the Cook Inlet drainages study area, August 2009

Williamsport meteorological monitoring station in the Cook Inlet drainages study area, July 2007



THE pebble PARTNERSHIP

Figure 26-1
Locations of Meteorological Monitoring Stations with Dates of Operation, Cook Inlet Drainage Study Area

Legend

- Meteorological Stations

Miles 0 1 2 3

Kilometers 0 1 2 3

N

Scale 1:100,000

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_Hoefler_PortArea_Fig26-1_8X11L_1of2_D03.mxd	Date: June 4, 2010
Version: 3	Author: RDI-MRA, LS