The background of the slide is a photograph of a high-altitude mountain landscape. In the foreground, a person wearing a bright red jacket and a dark hat is crouched on a rocky, sparsely vegetated slope. To the left, a tall, thin metal pole with a sensor or camera at the top is visible. The middle ground shows steep, rocky mountain slopes with patches of snow and ice. In the background, more snow-capped mountain peaks rise against a clear blue sky.

***WIND AND MOUNTAIN
CLIMATOLOGY IN
SEVERE ENVIRONMENTS:***

**AVERAGE WINTER AND SUMMER
HISTORICAL TEMPERATURE
TRENDS:
*MOUNT WASHINGTON AND
DENALI NATIONAL PARK HQ SITE***

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D. E. GLIDDEN

March 2016



DENALI NP D. E. GLIDDEN

SUMMARY

A GENERAL COMPARISON OF AVERAGE WINTER AND SUMMER TEMPERATURE TRENDS FOR MOUNT WASHINGTON AND DENALI NP HQ IS PRESENTED IN THE GRAPHS BELOW. THE DENALI HQ SITE (SOUSANES, 2015) HAS A SLIGHTLY LONGER RECORD THAN MOUNT WASHINGTON, BUT BOTH THE OVERALL AND SPECIFIC COMPARATIVE TENDENCIES ARE OF INTEREST. ACCOUNTING FOR THE DISCREPANCY IN RECORD LENGTH, SOME DIFFERENCES AND SIMILARITIES EXIST.

FOR MOUNT WASHINGTON, AVERAGE WINTER MAXIMA OCCURRED IN 1997 (15.2 F) AND MINIMA IN 1976, (0.56 F), WHILE FOR DENALI (SOUSANES, 2015) THE SAME VALUES OCCURRED IN 2001 (17.3 F) AND IN 1933 (-8 F).

FOR MOUNT WASHINGTON, AVERAGE SUMMER MAXIMA OCCURRED IN 2005 (51.5 F) AND MINIMA IN 1982 (43.6 F), WHILE FOR DENALI (SOUSANES, 2015) THE SAME VALUES OCCURRED IN 2004 (58.6 F) AND IN 1971 (48.9 F).

OVERALL RECORD TREND FOR BOTH MOUNT WASHINGTON AND DENALI HQ APPEARS TO BE POSITIVE.

HOWEVER, FOR THE PAST DECADE, THAT POSITIVE TREND APPEARS TO BE FLAT – AT LEAST FOR MOUNT WASHINGTON – AND MAY SUPPORT THE OBSERVATION OF A SUBSYNOPTIC “CLIMATIC PAUSE” IN THE OVERALL POSITIVE TREND (G12). (SEE FYFE, 2016 AND TOLLEFSON, 2016.)

FOR ANOTHER PERSPECTIVE, ONE SHOULD COMPARE THE CURRENT TRENDS OF AVERAGE ANNUAL, SUMMER, AND WINTER TEMPERATURES WITH THOSE DERIVED FROM A 30-YEAR-OLD MOUNT WASHINGTON STUDY FOR 1936-1985 (GLIDDEN, 1986), AND LISTED BELOW AS FIGS. 5, 6, 8, 11, AND 12.

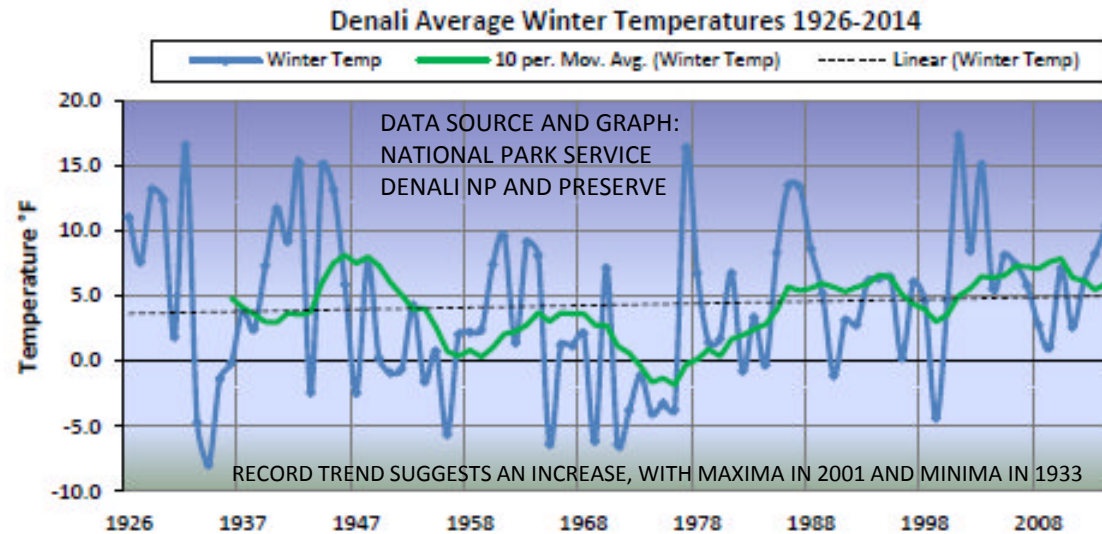
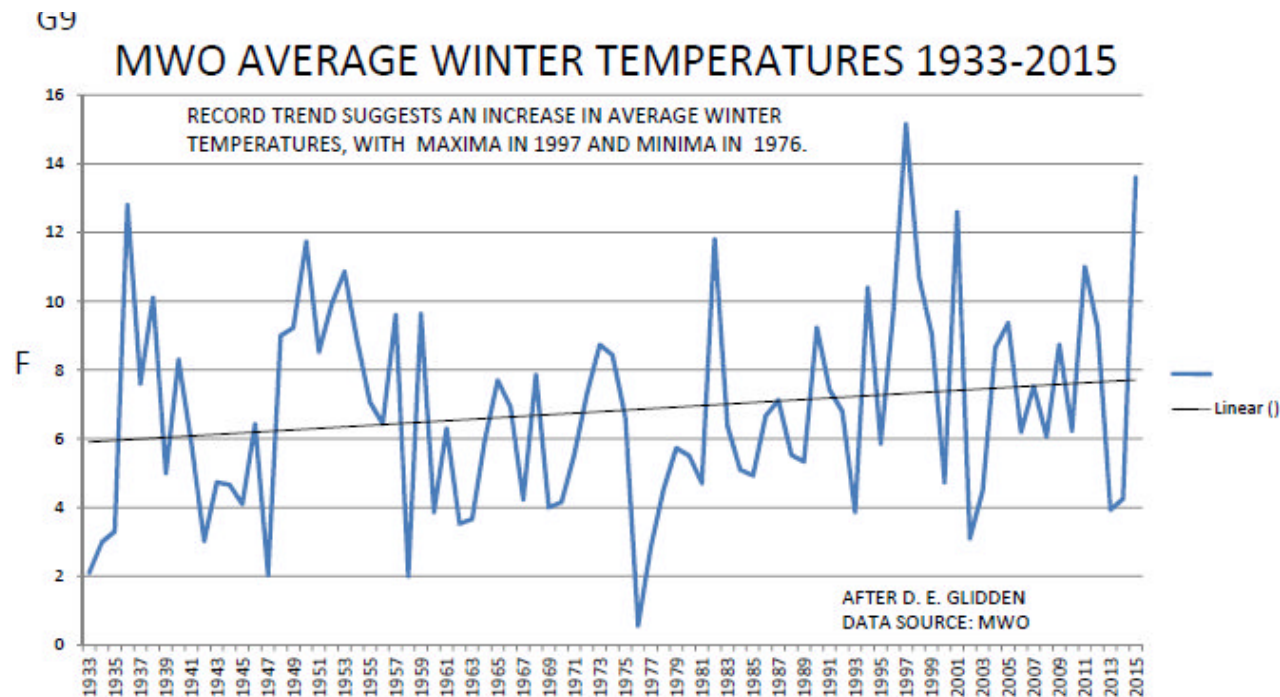
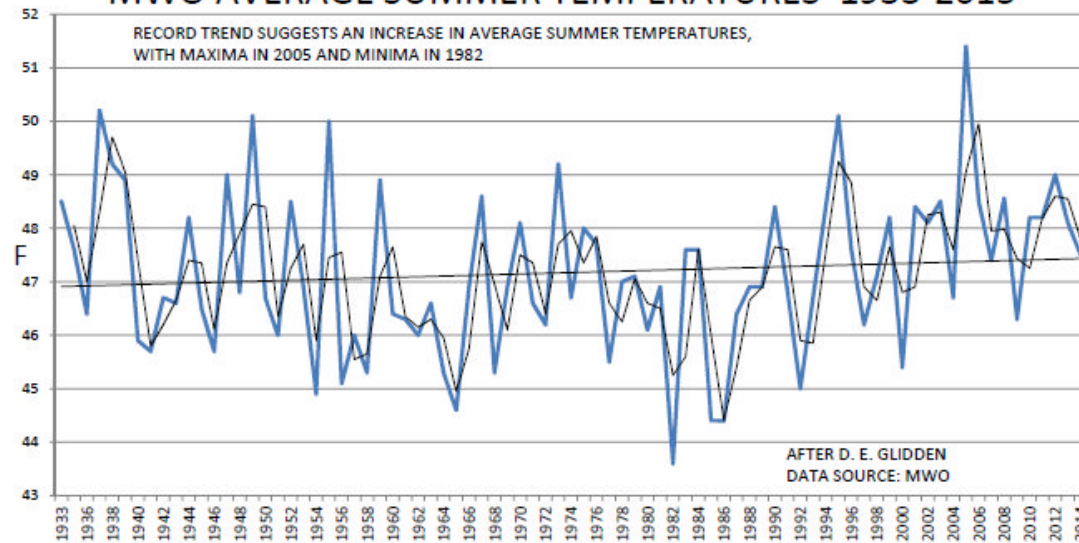


Figure 4. Average **winter temperatures** (December, January, February) at Denali Park Headquarters over the past 88 years. The green line shows a **10-year moving average**. The dotted line shows a simple **linear regression**

G8

MWO AVERAGE SUMMER TEMPERATURES 1933-2015



DATA PLATFORM DEVELOPED DURING THE EDUTRIP PROGRAM IN MOUNTAIN CLIMATOLOGY

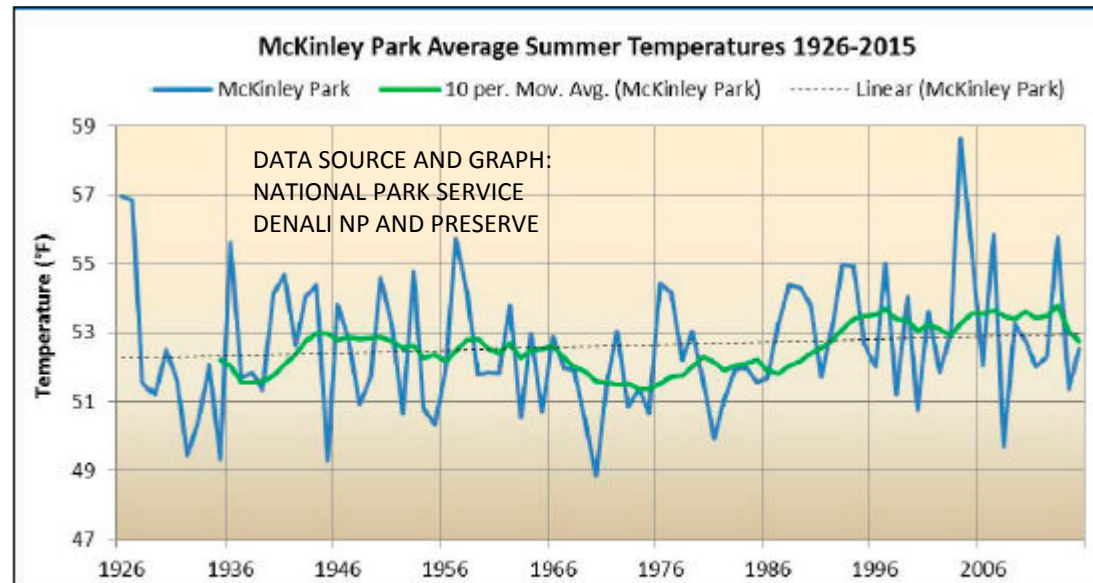
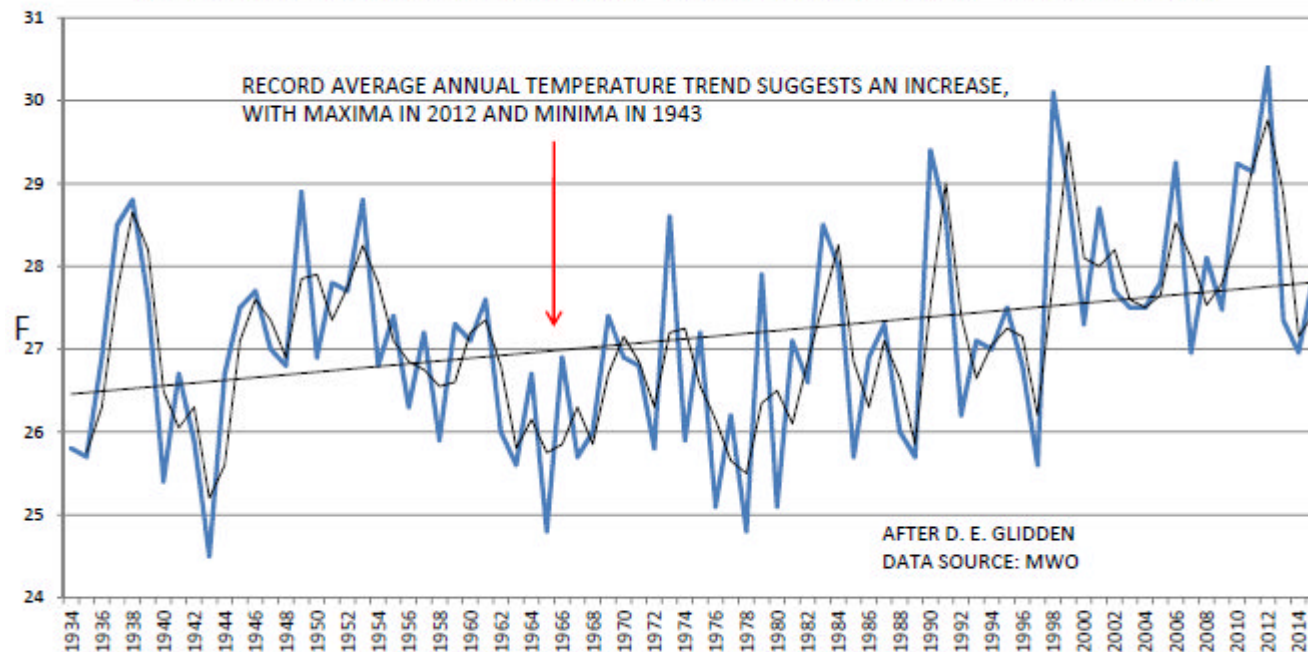


Figure 4. Average **summer temperatures** (June, July, August) at Denali Park Headquarters over the past 89 years. The green line shows a **10-year moving average**. The dotted line shows a simple linear regression trend.

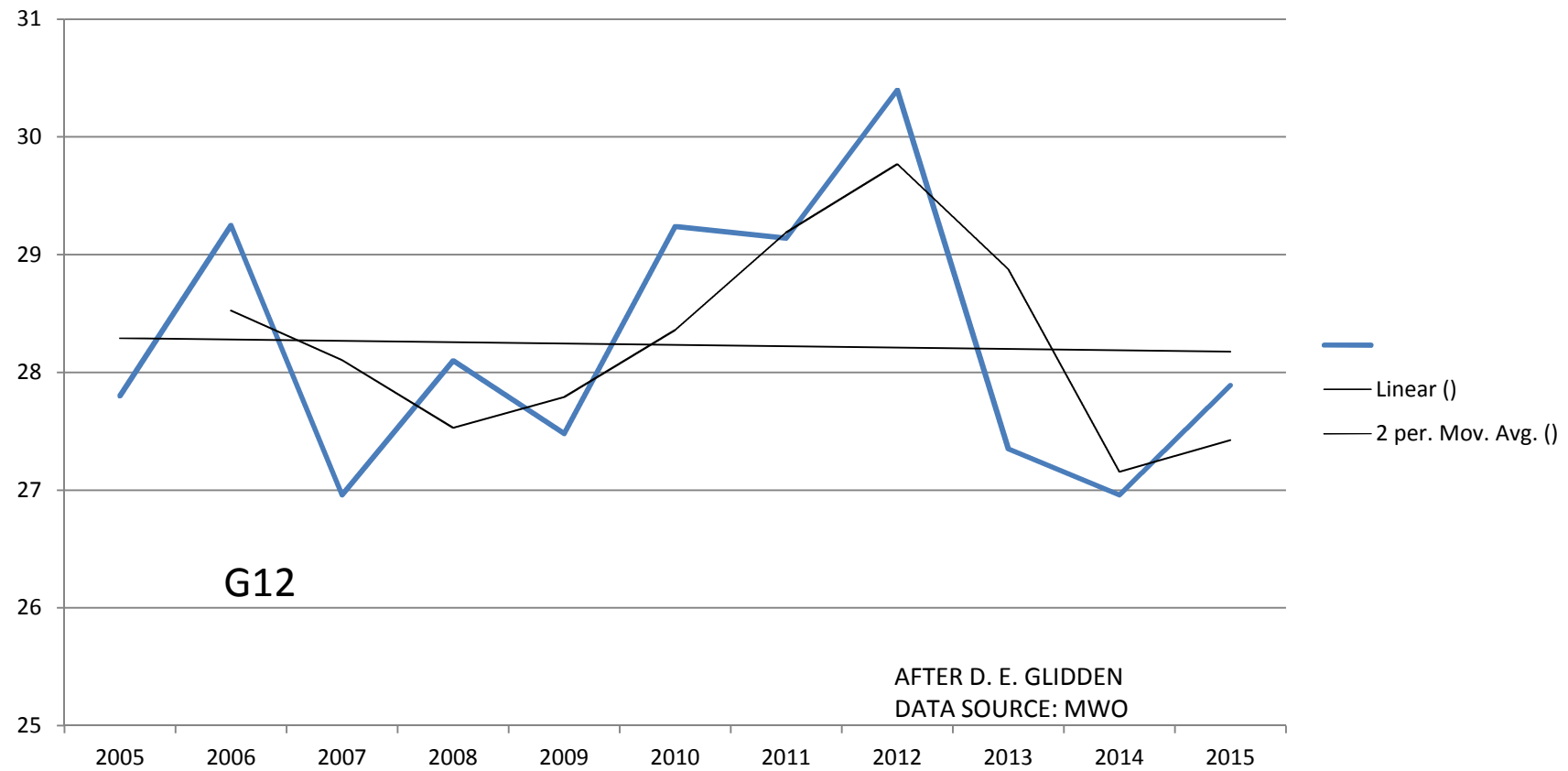
G10

MWO AVERAGE ANNUAL TEMPERATURES 1934-2015

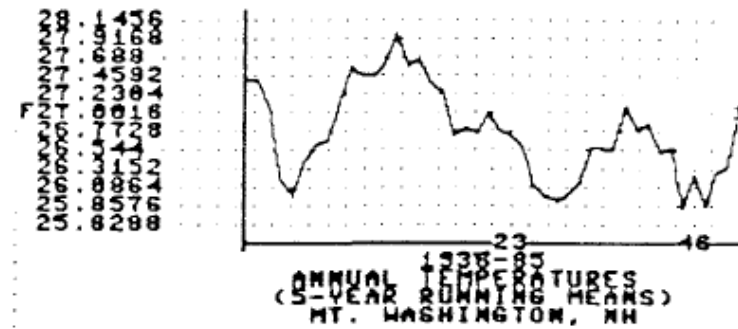


DATA PLATFORM DEVELOPED DURING THE EDUTRIP PROGRAM IN MOUNTAIN CLIMATOLOGY

MWO AVERAGE ANNUAL TEMPERATURES 2005-2015



GLIDDEN, D. E., 1986, *Mount Washington Temperature and Wind Data: A 50-Year Review, 1936-85*,
 Mount Washington Observatory News Bulletin, vol. 27, no. 3



DATA SOURCE: MWO
 DATA ANALYSIS: D. E. GLIDDEN

FIG. 5

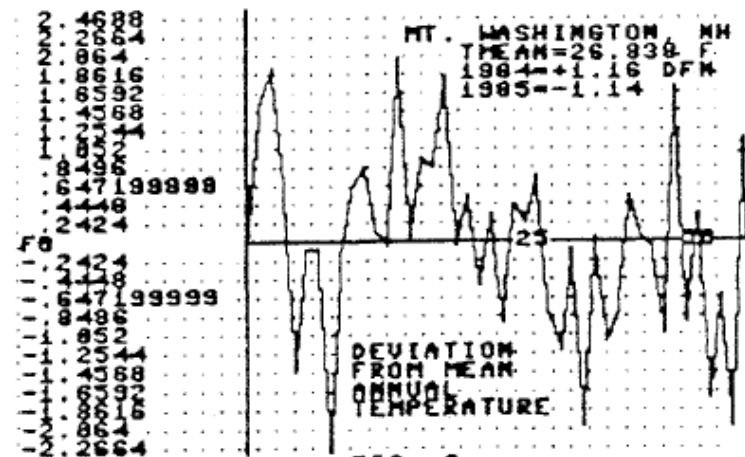
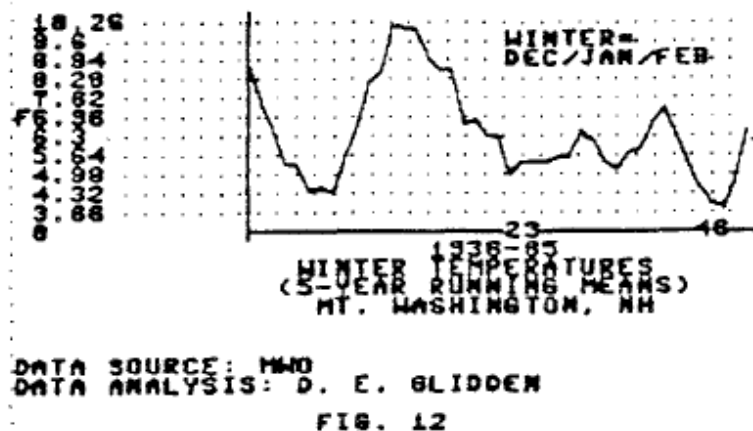
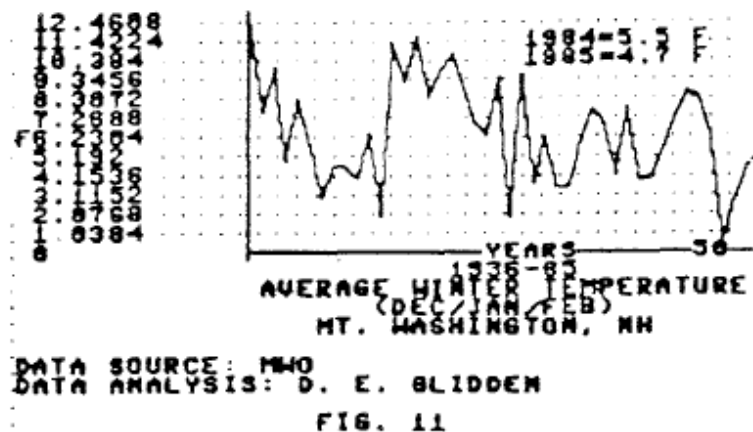
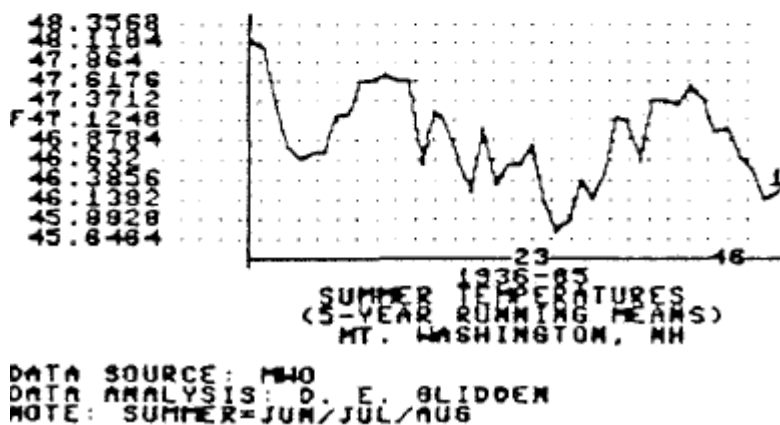
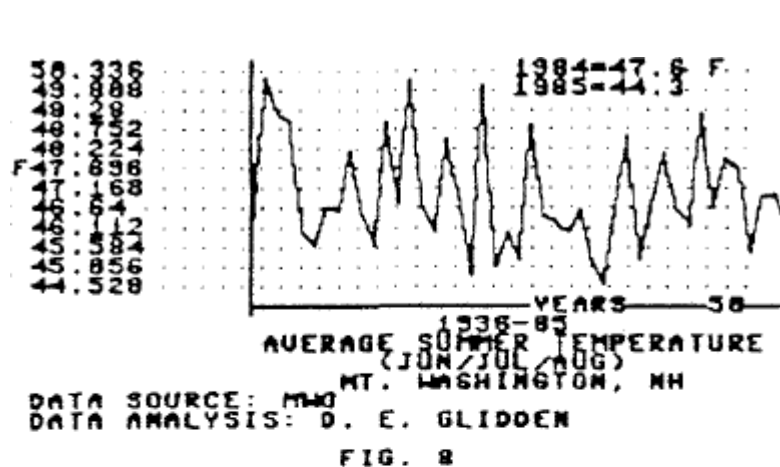
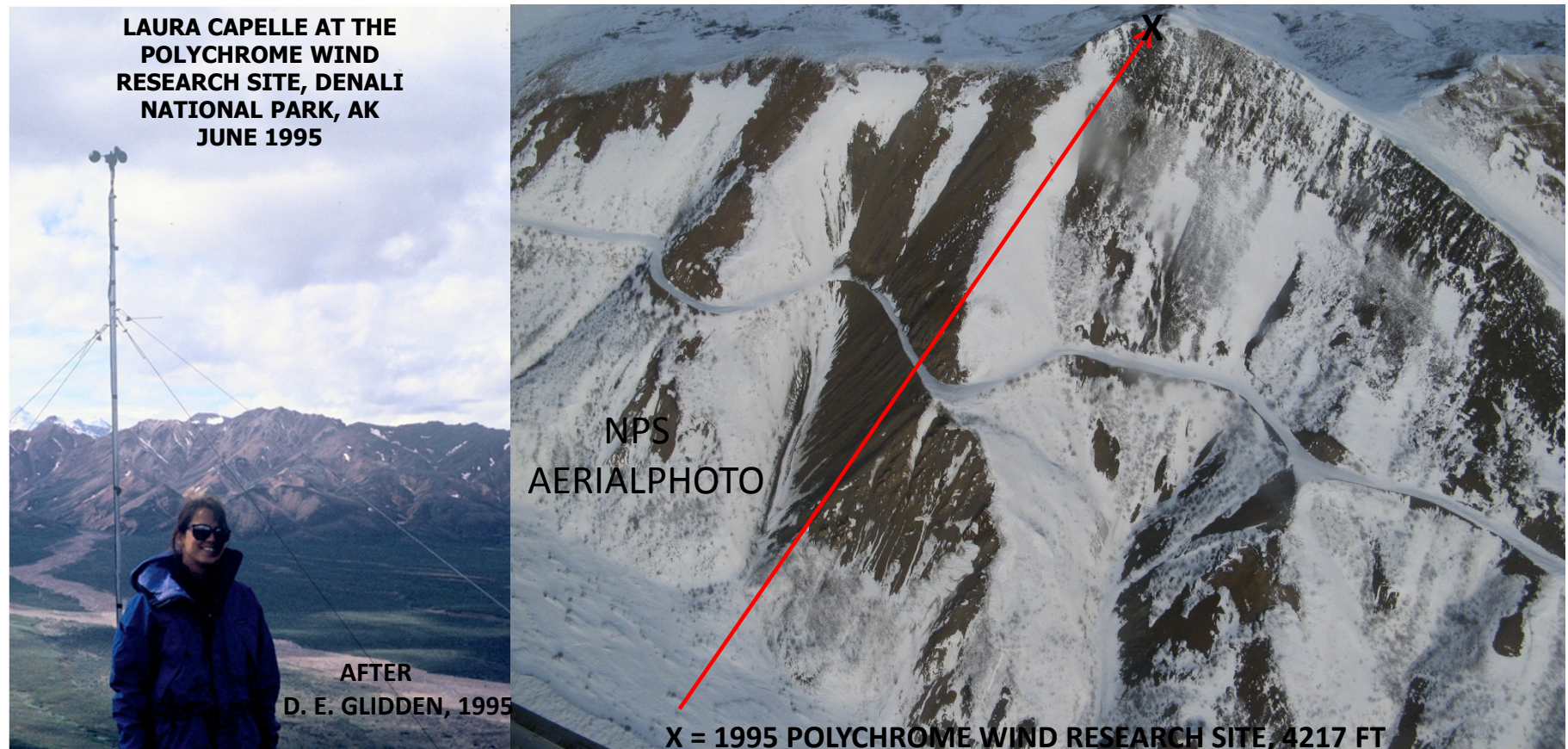


FIG. 6

GLIDDEN, D. E., 1986, *Mount Washington Temperature and Wind Data: A 50-Year Review, 1936-85*,
 Mount Washington Observatory News Bulletin, vol. 27, no. 3





GLIDDEN, D. E., 1986, *Mount Washington Temperature and Wind Data: A 50-Year Review, 1936-85*, **Mount Washington Observatory News Bulletin**, vol. 27, no. 3

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OCCASIONAL PAPERS ON MOUNT WASHINGTON CLIMATOLOGY

Glidden, D. E., March, 2016, *Average Winter and Summer Historical Temperature Trends for Mount Washington and Denali National Park HQ*, Occasional Paper, 10 p. (2.2 MB)

The following Occasional Papers on Mount Washington and White Mountains Climatology, which are available in PDF form and developed from nearly 18 years of weekend summit seminar platforms, may offer historical climate comparison trends with benchmark data from other selected National Parks:

Glidden, D. E., March, 2016, *Mount Washington Trends in Selected Climatological Variables*, Occasional Paper, 18 p. (1.78 MB)

Glidden, D. E., April, 2016, *Mount Washington Trends in Average Station Pressure and Annual Wind Speed*, Occasional Paper, 11 p. (5.61 MB)

Glidden, D. E., 2007, *Mount Washington Wind Climatology: Recent Data Analysis and Historical Changes in Summit Sensor Location*, Occasional Paper, 7 p.

Glidden, D. E. 2012, *University of Massachusetts Climatological Research in the White Mountains, NH 1972-73: Selected Excerpts*, Occasional Paper, 35 p., (6.6 MB)

Glidden, D. E., 1974, *The Great Windstorm of 2 April 1973 on Cannon Mountain, NH*, Weatherwise, v. 27, no. 4, Aug.
<http://www.tandfonline.com/doi/abs/10.1080/00431672.1974.9931700>