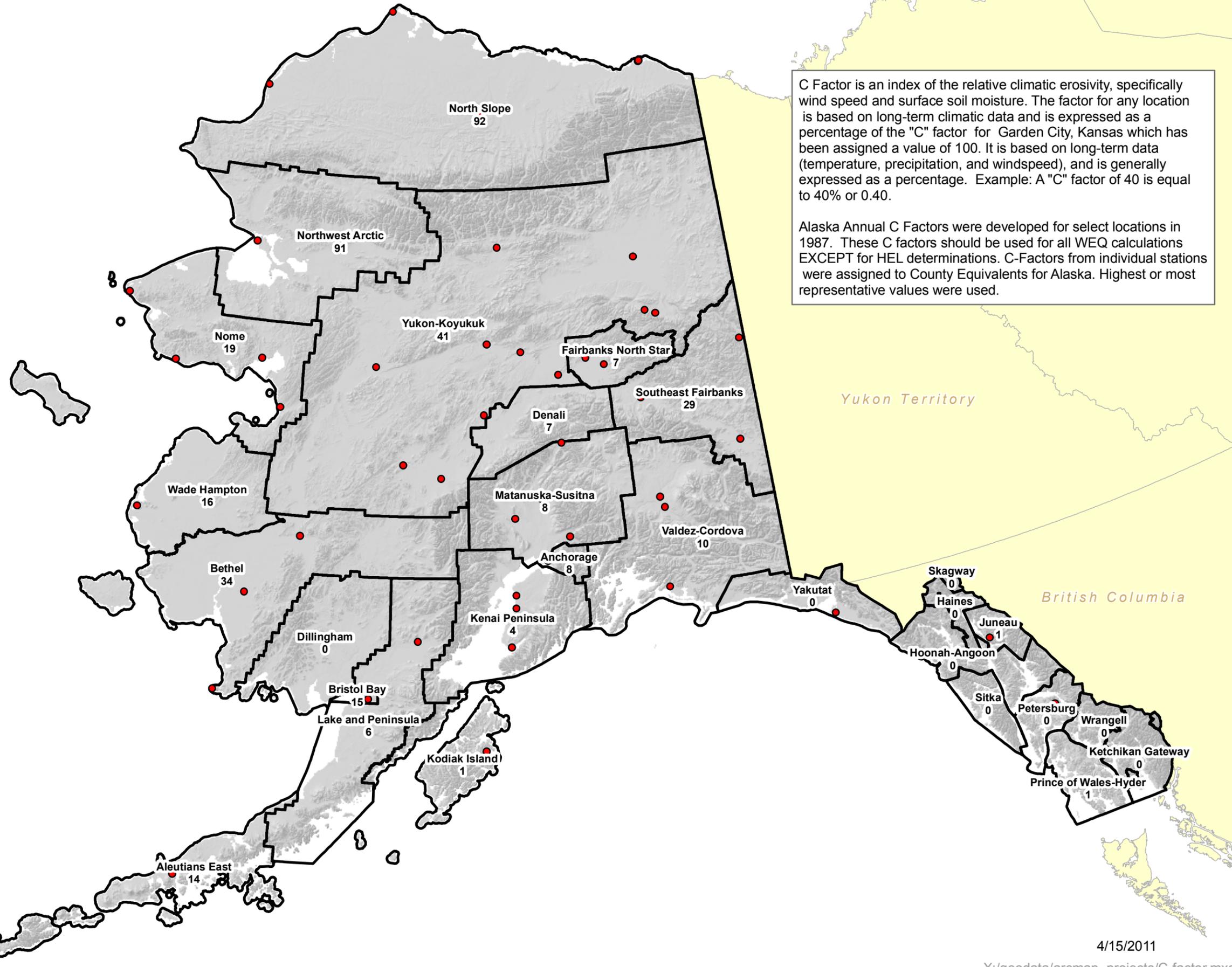


Annual C Factors for Alaska for WEQ calculations

Coop_Stn_N	C_Factor
AMCHITKA ISLAND	32
ANCHORAGE	8
ANIAK	3
ANNETTE WSO AIRPORT	1
BARROW WSO AIRPORT	92
BARTER ISLAND	84
BETHEL WSO AIRPORT	34
BETTLES	6
CAPE NEWENHAM	5
CAPE ROMANZOF	16
CENTRAL NO 2	5
CIRCLE HOT SPRINGS	5
COLD BAY WSO AIRPORT	14
COPPER CENTER	10
CORDOVA FAA AP	1
EAGLE	1
EIELSON FIELD	1
ELMENDORF AFB	2
FAIRBANKS WSO AIRPORT	7
FAIRWELL	11
FORT GREELY	29
FORT YUKON	41
GALENA	4
GULKANA FAA/AMOS	10
HOMER WSO AIRPORT	1
ILLIAMNA	6
JUNEAU AP	1
KAKTOVIK	95
KASILOF	3
KENAI FAA AIRPORT	4
KING SALMON WSO AP	15
KODIAK WSO AIRPORT	1
KOTZEBUE WSO AIRPORT	91
MANLEY HOT SPRINGS	2
MCGRATH WSO AIRPORT	2
MINCHUMINA	4
MOSES POINT	16
NENANA MUNICIPAL AP	9
NOME WSO AIRPORT	19
NORTHWAY FAA AIRPORT	3
PALMER	7
PETERSBURG	0
POINT LAY	99
SHEMYA USAF BASE	40
SITKA FAA JAPONSKI AP	0
SKWENTNA	1
ST PAUL ISLAND WSO AP	20
SUMMIT	7
TALKEETNA WSCMO AP	1
TANANA FAA AIRPORT	4
TIN CITY	112
UMIAT	21
UNALAKLEET WSO AIRPORT	40
YAKUTAT WSO AIRPORT	0



C Factor is an index of the relative climatic erosivity, specifically wind speed and surface soil moisture. The factor for any location is based on long-term climatic data and is expressed as a percentage of the "C" factor for Garden City, Kansas which has been assigned a value of 100. It is based on long-term data (temperature, precipitation, and windspeed), and is generally expressed as a percentage. Example: A "C" factor of 40 is equal to 40% or 0.40.

Alaska Annual C Factors were developed for select locations in 1987. These C factors should be used for all WEQ calculations EXCEPT for HEL determinations. C-Factors from individual stations were assigned to County Equivalents for Alaska. Highest or most representative values were used.

● weq C factor stations (1987 ref)

CLIMATIC FACTOR - "C"

Wind Erosion Equation $E=f[(IKC)LV]$

"C" Factor Objectives

These materials will help the participant understand:

- The definition of the WEQ "C" factor
- The climatic effects that are used to determine the "C" factor
- The meaning and use of erosive wind energy (EWE) distribution

"C" Climatic Factor

The "C" factor is an index of the relative climatic erosivity, specifically wind speed and surface soil moisture. The factor for any given location is based on long-term climatic data and is expressed as a percentage of the "C" factor for Garden City, Kansas which has been assigned a value of 100. It is based on long term data (temperature, precipitation, and windspeed), and is generally expressed as a percentage. Example: A "C" factor of 40 is equal to 40% or 0.40.

"C" Climatic Factor

The information required to calculate the "C" factor includes:

- Average annual wind speed
- Average monthly precipitation
- Average monthly temperature

Two different calculations are required in order to determine a "C" factor. The first calculation determines the Thornthwaite precipitation effectiveness (PE) index or effectiveness of surface soil moisture. The annual PE is the sum of the 12 monthly PE indices, and is determined using the following equation:

$$PE = \sum_{12} \left(\frac{P}{T - 10} \right)^{10 / 9}$$

PE = precipitation-effectiveness index

P = average monthly precipitation

T = average monthly temperature

The second calculation, below, determines the annual “C” factor. It uses the annual precipitation effectiveness index. This equation is based on the assumption that soil movement is proportional to the windspeed cubed. A small change in velocity can make a large difference in the “C” factor. It also assumes that soil movement varies inversely with the surface soil moisture.

$$C = \frac{(34.48)V^3}{(PE)^2}$$

Where:

C = annual climatic factor

34.48 = constant

V = average annual wind velocity

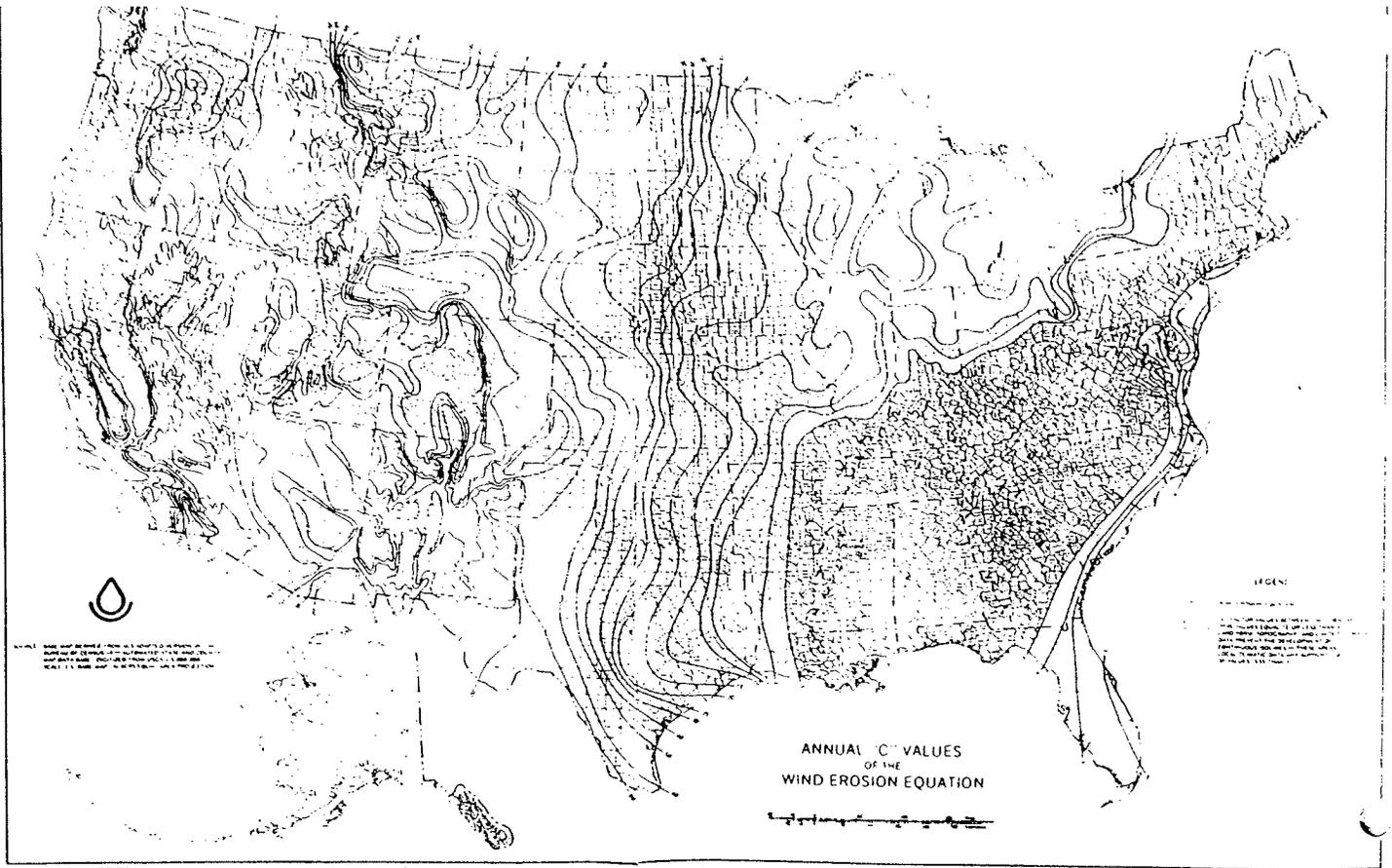
PE = annual precipitation effectiveness index

“C” Climatic Factor Concepts

- As average annual wind speed increases, “C” factor values increase
- As average monthly precipitation increases, “C” factor values decrease
- As average monthly temperature increases, “C” factor values increase

Annual Climatic Factor

A national “C” factor isoline map was developed by NRCS in 1987. The isolines were drafted using 1951-1980 weather data and were correlated across state and regional boundaries. NRCS state agronomists may develop local or county isolines where local data is available. Precipitation, temperature, and wind velocity data must be available in order to support locally developed “C” factors. The influence of topography may also be considered. Locally developed isolines must be consistent with the national isoline map. Interpolation between national or state developed isolines is generally done in increments of not less than 5. In some states, where isolines are consistent throughout a county, a county may be given one “C” factor to use. Where lines are not consistent, isolines with more than one value per county have been used. State agronomists should assure that “C” factors are consistent from county to county and across state and regional boundaries.



Isoline maps are not available for Alaska. Do not use the C factors from this map for calculating wind erosion in Alaska. See the list of C factors for selected locations on the following page.

ALASKA

ANNUAL C FACTORS¹

Use these C factors for all WEQ calculations EXCEPT for HEL determinations. (see General Manual 450 part 402 Amendment AK-1 October 21, 1987)

AMCHITKA ISLAND	32	MCGRATH	2
ANCHORAGE	8	MINCHUMINA	4
ANIAK	3	MOSES POINT	16
ANNETTE	1	NENANA	9
BARROW	92	NOME	19
BARTER ISLAND	84	NORTHWAY	3
BETHEL	34	PALMER	7
BETTLES	6	PETERSBURG	0
CAPE NEWENHAM	5	POINT LAY	99
CAPE ROMANZOF	16	ST. PAUL ISLAND	20
CENTRAL HOUSE	5	SHEMYA	40
CIRCLE HOT SPRINGS	5	SITKA	0
CLEARWATER	12	SKWENTNA	1
COLD BAY	14	SUMMIT	7
COPPER CENTER	10	TALKEETNA	1
CORDOVA	1	TANANA	4
EAGLE	1	TIN CITY	112
ELMENDORF AFB	2	UMIAT	21
EIELSON AFB	1	UNALAKLEET	40
FAIRBANKS	7	YAKUTAT	0
FAREWELL	11		
FORT GREELY (DELTA)	29		
FORT YUKON	41		
GALENA	4		
GULKANA	10		
HOMER	1		
ILIAMNA	6		
JUNEAU	1		
KASILOF	3		
KENAI	4		
KING SALMON	15		
KODIAK	1		
KAKTOVIK	95		
KOTZEBUE	91		
LAKE MINCHUMINA	5		
MANLEY HOT SPRINGS	2		

¹ DO NOT USE C FACTORS FROM THE NATIONAL C FACTOR MAP.