



**I will probably talk about ESP !
If you listen you will probably learn !**

“The probable is what usually happens.”

-- Aristotle

“It is a truth very certain that, when it is not in our power to determine what is true, we ought to follow what is most probable.”

-- Rene Descartes

“All models are wrong, but some are useful.”

-- G.E.P. Box

“Then there is the man who drowned crossing a stream with an average depth of six inches.”

-- W.I.E. Gates

“ESP is the linchpin of AHPS...and it is most probably about probability.”

-- Dave Brandon



What Does ESP Stand For ?

Extended Streamflow Prediction

Began: Late 1970s

{ Highlights TIME element }

Ensemble Streamflow Prediction

Changed: Mid 1990s

{ Highlights ENSEMBLES }

ESP: A Component of NWSRFS

Short Term
Deterministic
Forecasts

(OFS)

Long Term
Probabilistic
Ensemble
Forecasts

(ESP)

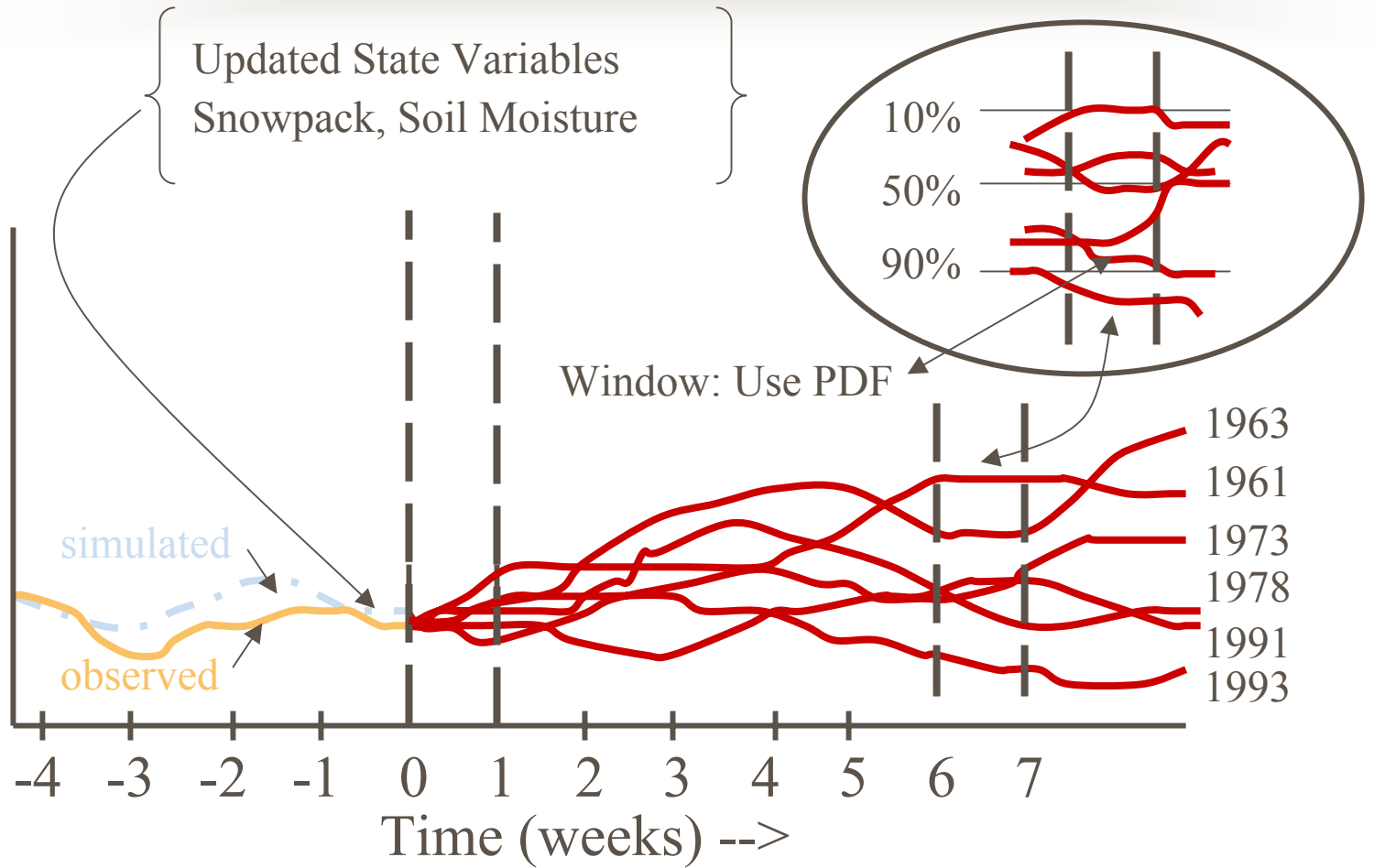
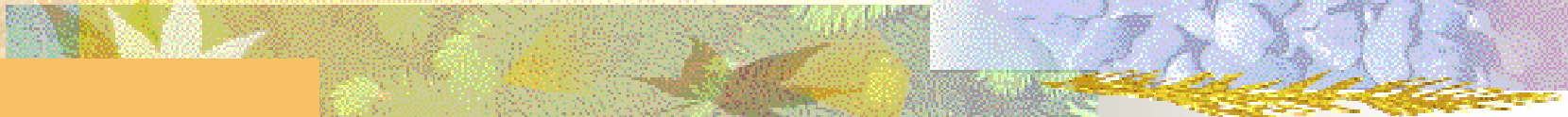
Calibration
System

(MCP)



ESP: A conditional forecast simulation
based on:

1. Current watershed conditions and model states, snow, soil moisture, flow
2. Known historical precipitation, Temperature and streamflow (can be weighted)



Model
Input

Observations
TA, PP, QC

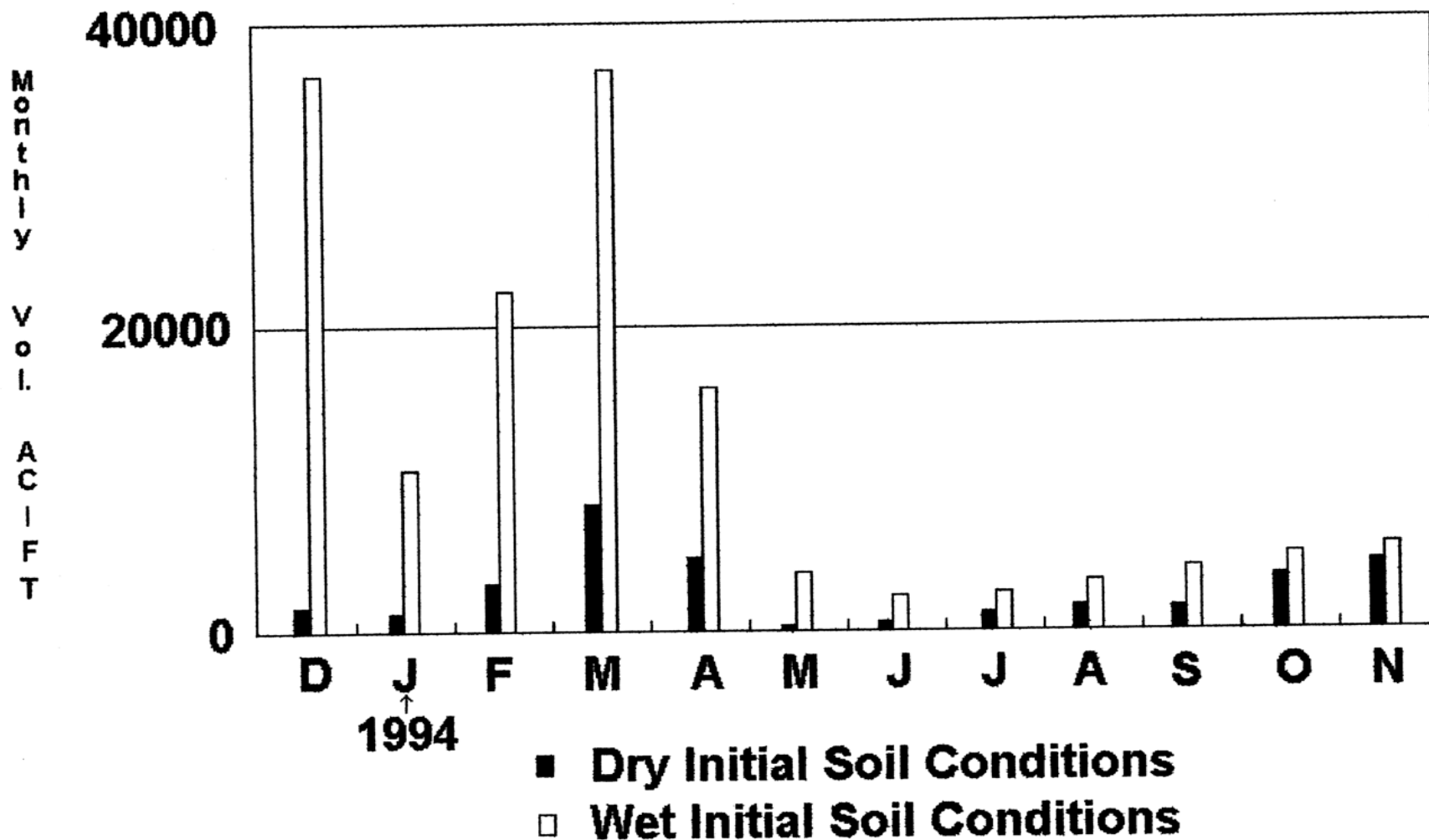
QPF
QTF

Yearly Historical Time Series PP & TA
based on Weighting Schemes

ESP... Forecast

Wet vs. Dry Initial Soil Conditions

(Oak Ck - Sedonia, AZ)





Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)

Objective:

Produce improved river forecasts by utilizing precipitation and temperature derived from the MRF meteorological model as input to the NWS Extended Streamflow Prediction forecast system for the first 14 days in lieu of using historical climatology.



Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)

Method:

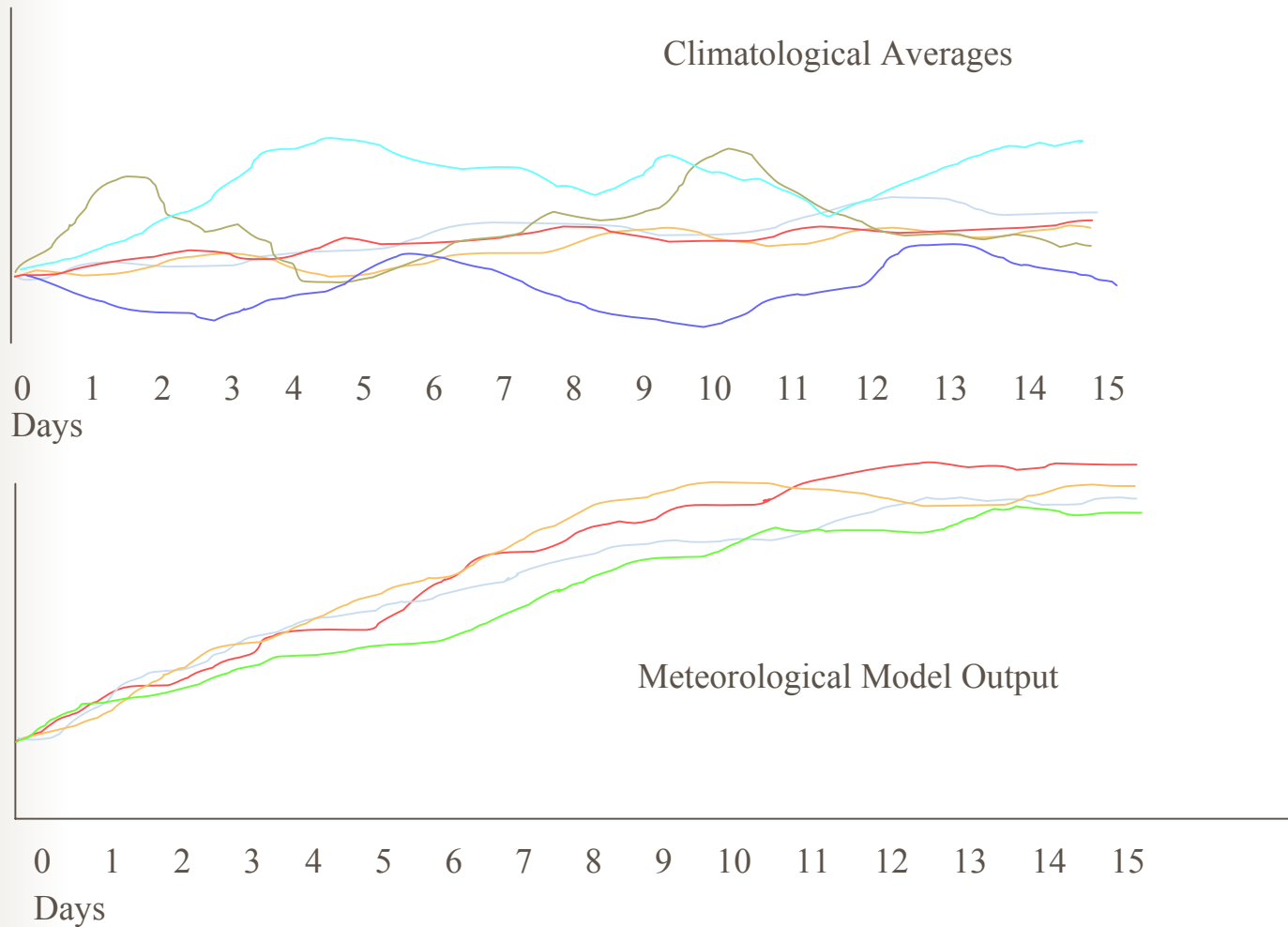
Mean areal precipitation (MAP) and mean areal temperature (MAT) will be calibrated to a frozen version of the MRF by using historical MAPs/MATs and historical output from the MRF model.

Operations:

CDC will provide a daily 16 member ensemble set of MAPs and MATs for all areas within a basin. The ensemble forecasts will be in 6 hour increments and go out for 14 days. They will be used in ESP.

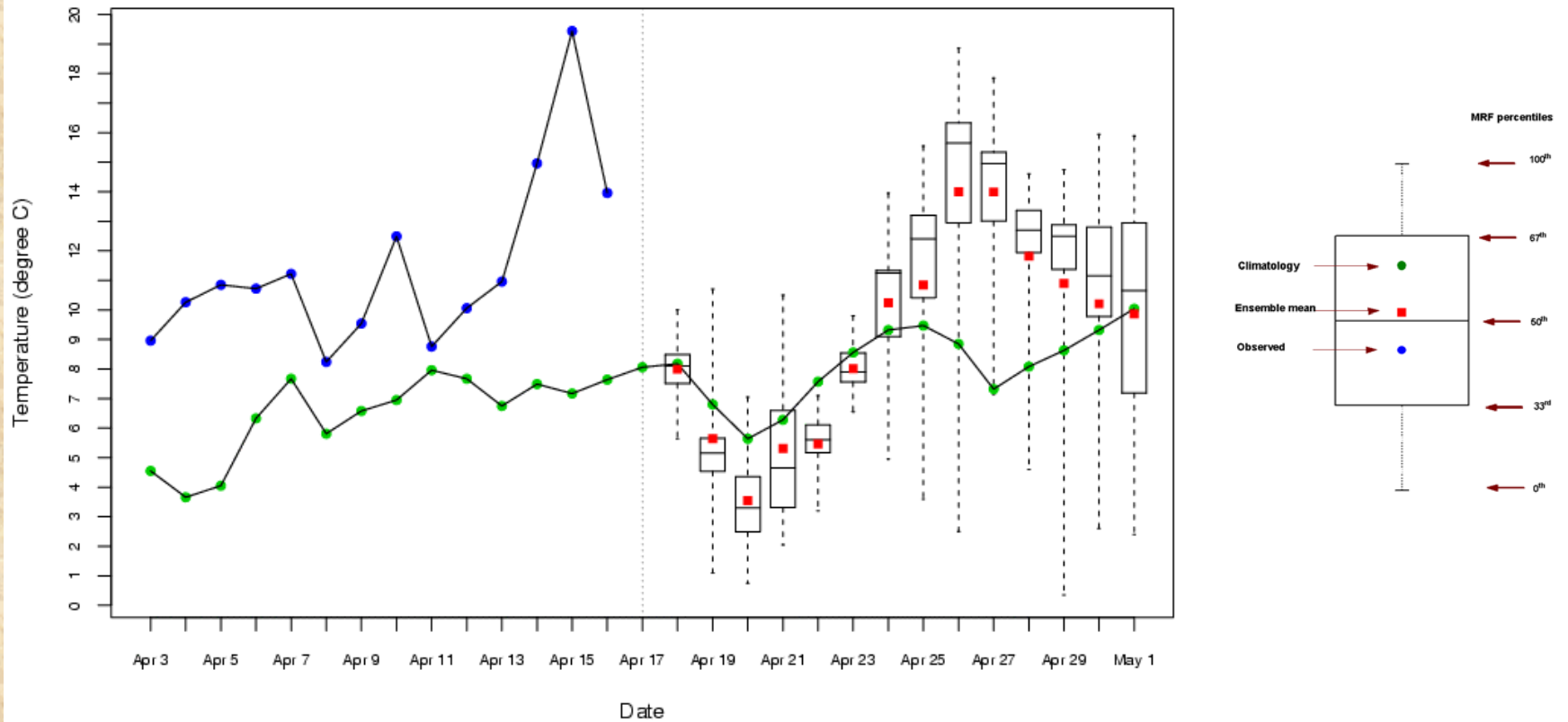
Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)



Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)





Time Series Weighting Schemes Available For Use in ESP

1. MANUAL YEAR WEIGHTS

Based on teleconnections
Analog/Like Years

2. CPC YEAR WEIGHT ADJUSTMENT

Produces year weights based upon
CPC climate forecasts for a region.
User enters climate shift type and
magnitude of forecast shift.

3. CPC PRE-ADJUSTMENT

Uses 1-5 day and 6-10 day and CPC long range
forecasts and modifies temperature and precipitation
input to ESP.

MANUAL YEAR WEIGHT ADJUSTMENT

The screenshot shows a window titled "Year Weight Dialog" with a "File" menu. The window contains a "Year Weights File Manager" section with the following fields:

- File name: elnino.yrwt
- Description: Created with Alaska Technique, Prec
- Included Years (example format: 1985): 1949
- Included Years (example format: 1985): 1993

Below these fields is a text instruction: "To modify the User-specified Weight, select desired line below, modify value in text field and <Enter>." This is followed by a "User-specified Weight" text field containing the value "1".

At the bottom is a table with three columns: "Year", "Normalized Weights", and "User-specified Weights". The table lists years from 1949 to 1964 with their respective normalized and user-specified weights.

Year	Normalized Weights	User-specified Weights
1949	0.000	0.000
1950	0.000	0.000
1951	0.000	0.000
1952	0.035	0.007
1953	0.000	0.000
1954	0.035	0.007
1955	0.000	0.000
1956	0.000	0.000
1957	0.000	0.000
1958	0.060	0.012
1959	0.000	0.000
1960	0.000	0.000
1961	0.000	0.000
1962	0.000	0.000
1963	0.000	0.000
1964	0.000	0.000

CPC PREADJUSTMENT OF MAP/MAT

CPCPreAdj

Initial Parameters

Contributing Region:

Initial Date (m/d/y):

1-5 Day Forecast

Start Day Start Month

Temp Min Anomaly (degF)

Temp Max Anomaly (degF)

Precipitation Total (inches)

6-10 Day Forecast

Start Day Start Month

Temperature

Precipitation

Seasonal Forecast

Initial Period: Dec 2000

Period	Precipitation Category	Prob. Anomaly (%)	Temperature Category	Prob. Anomaly (%)
Dec 2000	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Dec - Feb (DJF) 2000	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Jan - Mar (JFM) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Feb - Apr (FMA) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Mar - May (MAM) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Apr - Jun (AMJ) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
May - Jul (MJJ) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Jun - Aug (JJA) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Jul - Sep (JAS) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Aug - Oct (ASO) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Sep - Nov (SON) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Oct - Dec (OND) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Nov - Jan (NDJ) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>
Dec - Feb (DJF) 2001	<input type="text" value="climatology"/>	<input type="text" value="0"/>	<input type="text" value="climatology"/>	<input type="text" value="0"/>

CPC YEAR WEIGHT ADJUSTMENT

CPC Year Weight Adjustment (Alaska Technique)

Initial Parameters

Contributing Region:

Period: Dec - Feb (DJF) 2000

Initial date: Dec 2000

Precipitation Forecast Parameters

Shift Type: above normal

Magnitude: 5%

Temperature Forecast Parameters

Shift Type: above normal

Magnitude: 10%

Create Year Weights Cancel