CAP88-PC V4 Training

Module 1.3

Downloading, Installing, and Running the CAP88-PC V4

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DOWNLOADING, INSTALLING, AND RUNNING CAP88-PC, VERSION 4.0

- Downloading CAP88-PC, Version 4.0

- Installing CAP88-PC, Version 4.0

- Using the Migration Utility

- Running the Code

  – Entering Input Parameters

  – Generating Output Reports

- File Structures

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DOWNLOADING CAP88-PC

- Download .NET Framework 4 from Microsoft (if not already installed)

    http://www.microsoft.com/net/download
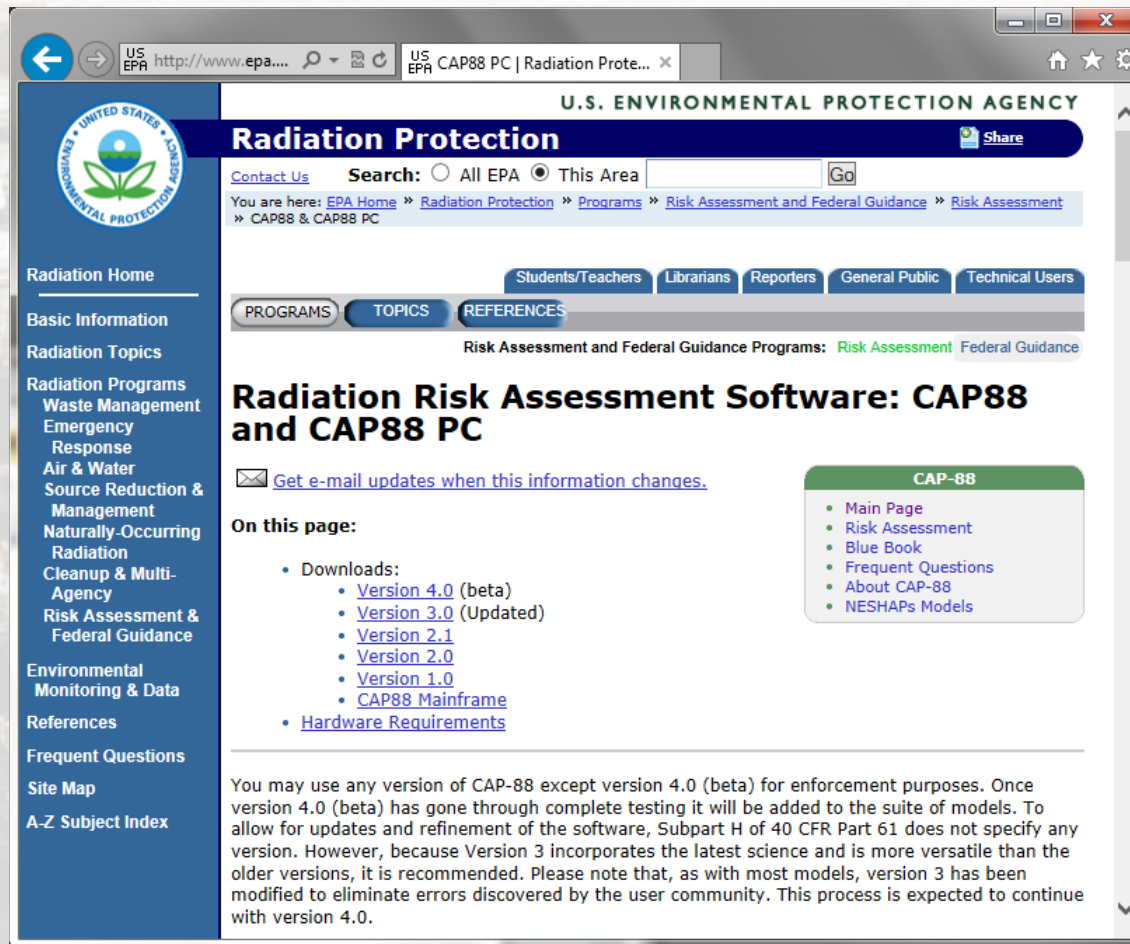
- Download CAP88-PC Version 4.0 from the EPA's website

    http://www.epa.gov/rpdweb00/assessment/CAP88/

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DOWNLOADING CAP88, VERSION 4.0

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INSTALLING CAP88-PC, VERSION 4.0

1. Install Microsoft .NET 4 Framework (Follow instructions provided by Microsoft.

2. Extract files from the compressed (ZIP) file

3. Right click the file "CAP88PC.Setup.msi" and select "Install"

4. Click "Run"

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RUNNING CAP88-PC, V4 THE FIRST TIME

1. After installing CAP88-PC, run the "Migration Utility" from the "Tool" menu:
   – Check "Copy v4 default …" if this is the first time the CAP88 is being run by that user.
   – Click "Run" (This step creates the user folders)
2. Select "Options" from the "Tool" menu:
   1. Click "Advanced"
   2. Click "Refresh FORTRAN"

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INSTALLING CAP88-PC, VERSION 4.0

- Installation of CAP88-PC requires Administrator rights

- Different major versions of CAP88-PC (e.g. V4.0 & V3.1) can be installed and run on the same machine simultaneously

- CAP88-PC can be installed to allow multiple users to run the code, but only one instance of the code can be run at a time, and only by one user at a time

ENTERING THE INPUT PARAMETERS

- Dataset
- Facility Information
- Population
- Meteorological
- Sources
- Agricultural
- Nuclides
- Reports

DATASET TAB

- Shows when the dataset was last saved
- Shows when reports were last generated

DATASET TAB EXAMPLE
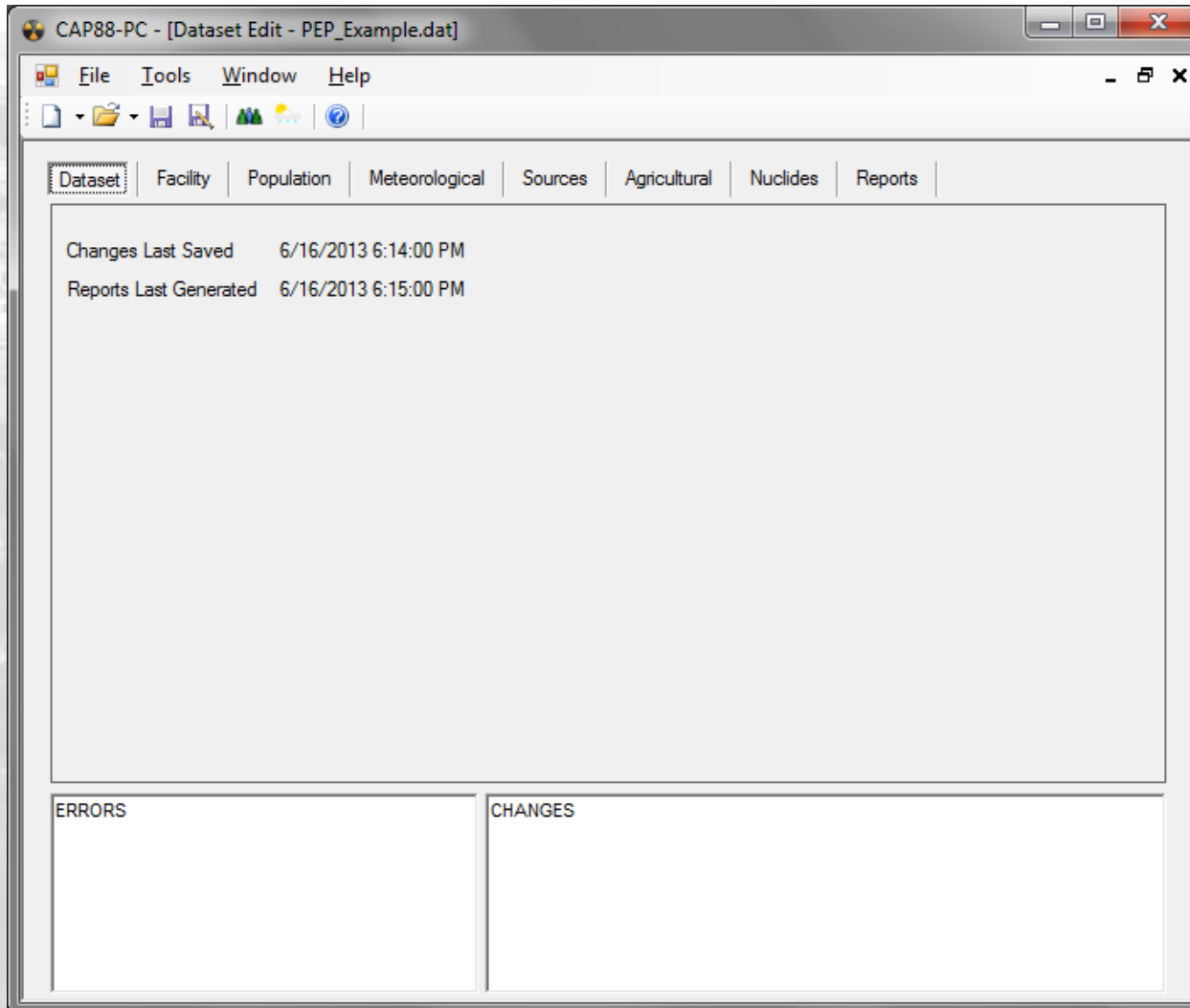
FACILITY TAB

The user enters the following information:

- Name of Facility (Optional)

- Address, City, and Zip Code of Facility (Optional)

- Emission Year (1949 to five years in the future)

- Source Category (Optional)

- Two Comments (Optional)

Note that the State is entered on the Agricultural Tab

FACILITY TAB EXAMPLE

POPULATION TAB

- The user enters the Run Type (Population or Individual)
  - For Population Type runs, the user selects the name of the population file from a drop-down menu
  - For Individual Type runs, the user enters between 1 and 20 midpoint locations for the receptor
- The user can specify the location of the Maximum Exposed Individual (MEI) or allow the code to determine the location.
- The user specifies the age of the receptor(s). This is new in Version 4

POPULATION TAB (CONTINUED)

- The user can change the buildup time. (Note that 100 years is required to demonstrate compliance with 40 CFR 61.

- The user can select the following reports to generate:
  - Dose and risk summaries
  - Dose and risk factors
  - Concentration tables
  - Chi/Q tables

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POPULATION TAB EXAMPLE

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METEOROLOGICAL TAB

- The user selects the wind file from a drop-down menu

- The user can enter the annual precipitation (must be between 0.01 and 500 cm y^{-1})

- The user can enter the annual ambient temperature (must be between -100 and 100 °C)

- The user can enter the lid height (must be between 25 and 10,000 m)

- The user can enter the absolute humidity (must be between 0.01 and 30 g m^{-3})

METEOROLOGICAL TAB EXAMPLE

SOURCES TAB

- The user selects the Source Type from a drop-down menu (Stack or Area)
- The user selects the number of sources (up to 6)
  - For each stack source, the user enters the height and diameter of each source
  - For each area source, the user enters the height and area of each source

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SOURCES TAB (CONTINUED)

- The user selects the Plume Type from a drop-down menu (Buoyant, Momentum, Fixed, or None)
  - For "Buoyant" plumes, the user enters the heat release rate of each source
  - For "Momentum" plumes, the user enters the exit velocity of each source
  - For "Fixed" plume types, the user enters the plume rise for each Pasquill category
  - For "None" " plume types, the plume rise for each Pasquill category is set to zero

SOURCES TAB EXAMPLE

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AGRICULTURAL TAB

- The user selects the food source from a drop-down menu (Urban, Rural, Local, Regional, Imported, and Entered)
  - For Urban, Rural, Local, Regional, and Imported, CAP88 will assign the fraction of vegetables, milk, and meat, that are home produced, produced in the assessment area, and imported.
  - For Entered, the user can assign the fraction of vegetables, milk, and meat, that are home produced, produced in the assessment area, and imported.
- The user can enter agricultural state from a drop-down menu. (CAP88 will assign beef and milk cattle density, and land fraction cultivated based on the state selected.

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AGRICULTURAL TAB EXAMPLE

NUCLIDES TAB

The user selects the nuclides to be modeled from the drop-down list, using the "Add" button. For each radionuclide selected:

- The user selects the chemical form from a drop-down menu.

- For particulate, the user selects the type and size.

- The user enters the release rates for each source.

- The user can also change the decay chain length

- For Rn-222, the user can select a "Radon Only" run

NUCLIDES TAB EXAMPLE

REPORTS TAB

- The user can generate reports based on the most recently saved dataset by selecting the "Generate" button.

- The user can print the current report, or selected reports, by selecting the "Print" button.

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REPORTS TAB EXAMPLE
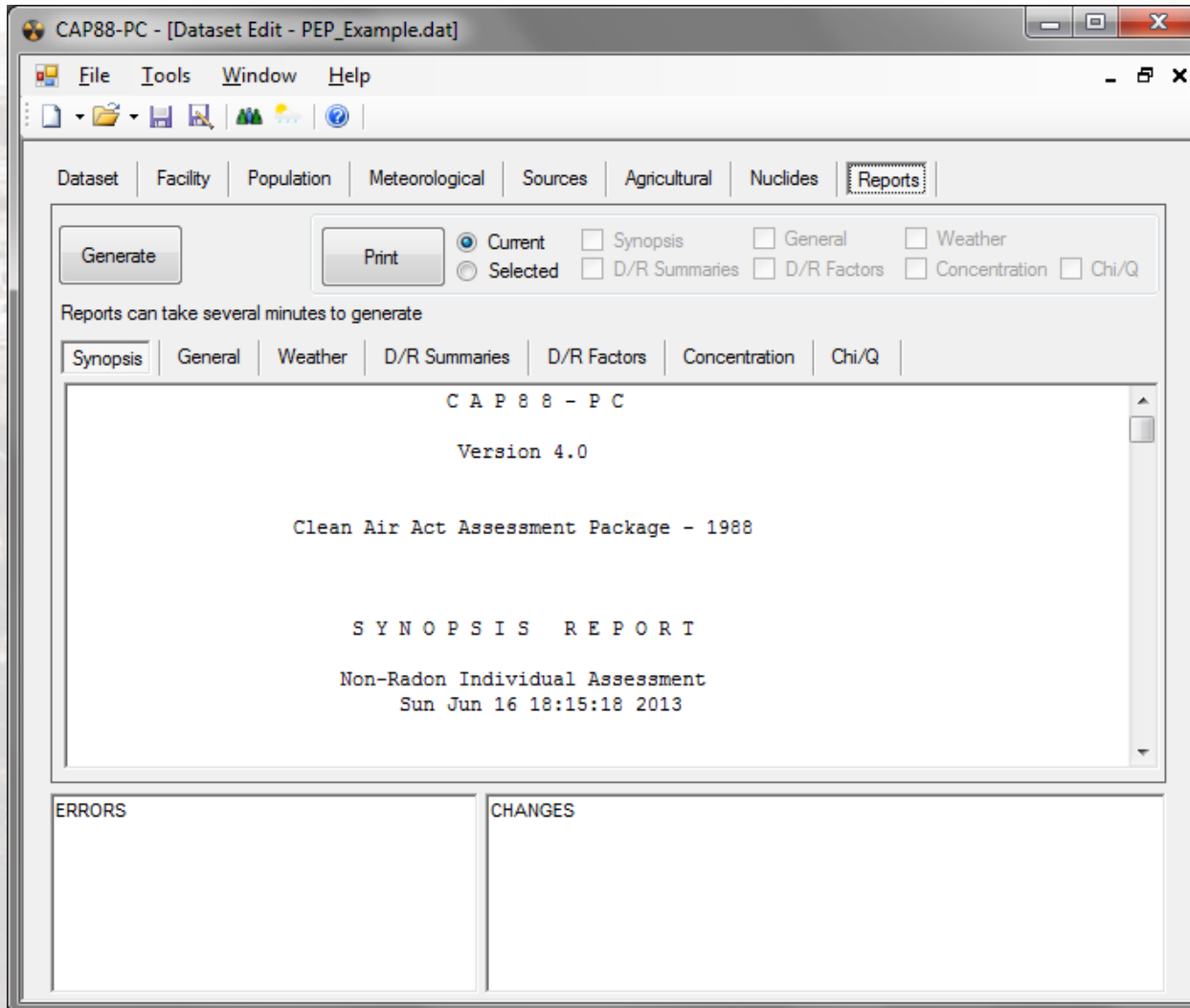
UNDERSTANDING THE OUTPUT REPORTS

- Synopsis Report

- General Data

- Weather Data

- Dose and Risk Summaries

- Dose and Risk Conversion Factors

- Concentration Tables

- Chi/Q Tables

- Reports

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SYNOPSIS REPORT

Includes summary of user inputs

- Facility Information

- Source Information

- Meteorological Information

- Agricultural Information

- Population Information

Includes location and dose/risk to the MEI

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GENERAL DATA

Includes Radionuclide-dependent Parameters For Released Isotopes

- Decay constants
- Milk/meat transfer coefficients
- Concentration uptake factors

GENERAL DATA (CONTINUED)

Includes Values For Radionuclide-independent Parameters
- Human inhalation rates
- Soil parameters
- Buildup and delay times
- Weathering
- Crop exposure duration
- Agricultural productivity
- Fallout interception fractions
- Grazing parameters
- Animal feed consumption factors
- Dairy productivity
- Meat animal slaughter parameters
- Decontamination
- Fractions grown in garden of interest
- Ingestion ratios
- Minimum ingestion fractions from outside area
- Human food utilization factors
- Swimming parameters

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WEATHER DATA

Includes

- Harmonic average wind speeds (wind towards) by direction and Pasquill stability class

- Arithmetic average wind speeds (wind towards) by direction and Pasquill stability class

- Frequencies of stability classes (wind towards) by direction and Pasquill stability class

DOSE AND RISK SUMMARIES

Includes

- Dose and Risk Totals to the MEI by
  - Organ
  - Pathway
  - Radionuclide
- Total Individual Dose at each Location
- Collective population dose for Population Type runs
- Total Collective Population Fatal Cancer Risk for Population Type runs

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DOSE AND RISK CONVERSION FACTORS

- Dose Conversion Factors for each radionuclide and chemical form by organ for the following pathways:
  - Ingestion(age-dependent)
  - Inhalation (age-dependent)
  - Air immersion
  - Ground surface
- Risk Conversion Factors for each radionuclide and chemical form by organ for the following pathways:
  - Ingestion(age-dependent)
  - Inhalation (age-dependent)
  - Air immersion
  - Ground surface

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CONCENTRATION TABLES

Includes for each location (direction and distance downwind) and radionuclide:

- Air concentration
- Dry deposition rate
- Wet deposition rate
- Total deposition rate

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CHI/Q TABLES

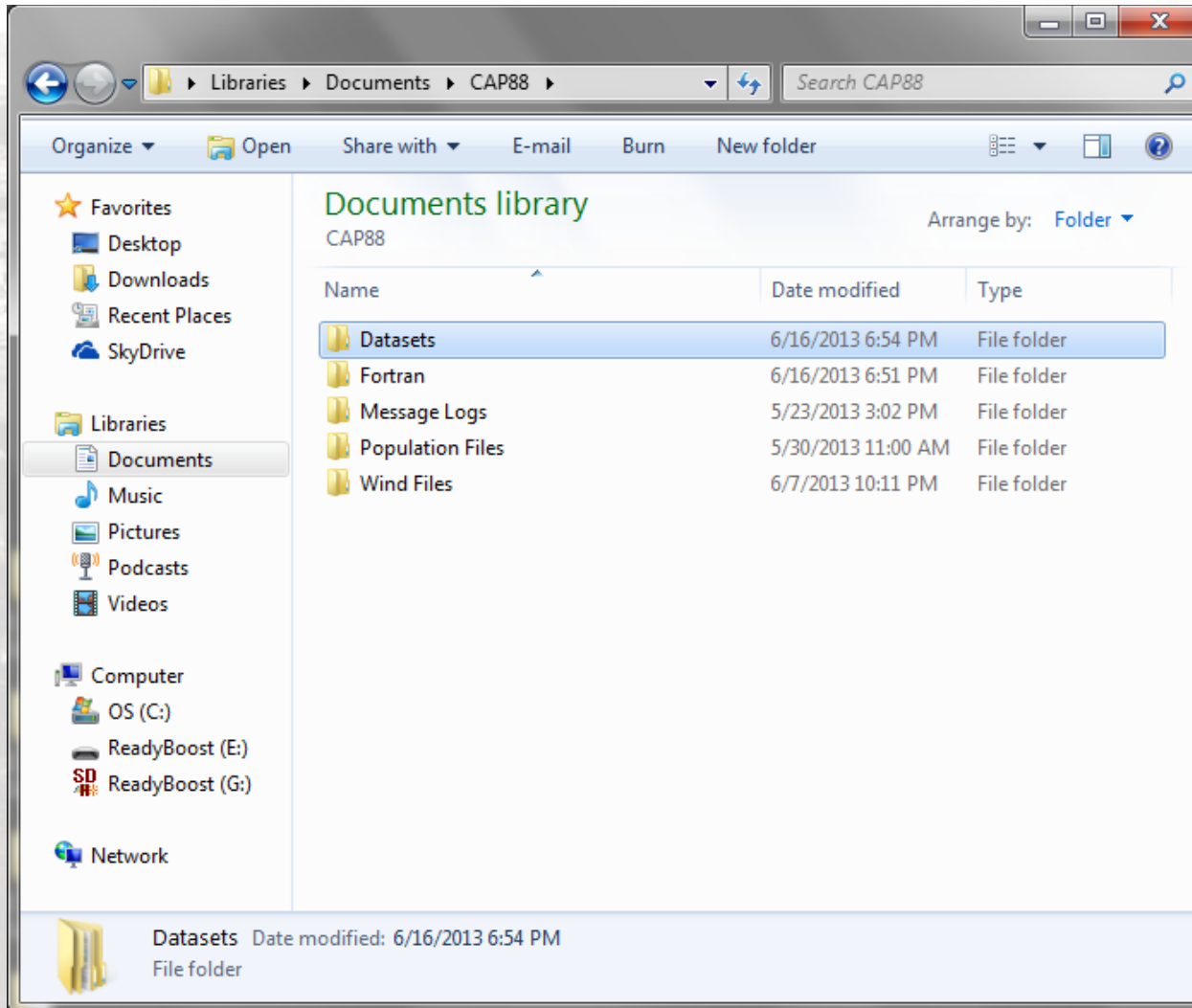Includes for each location (direction and distance downwind) the value of chi/Q
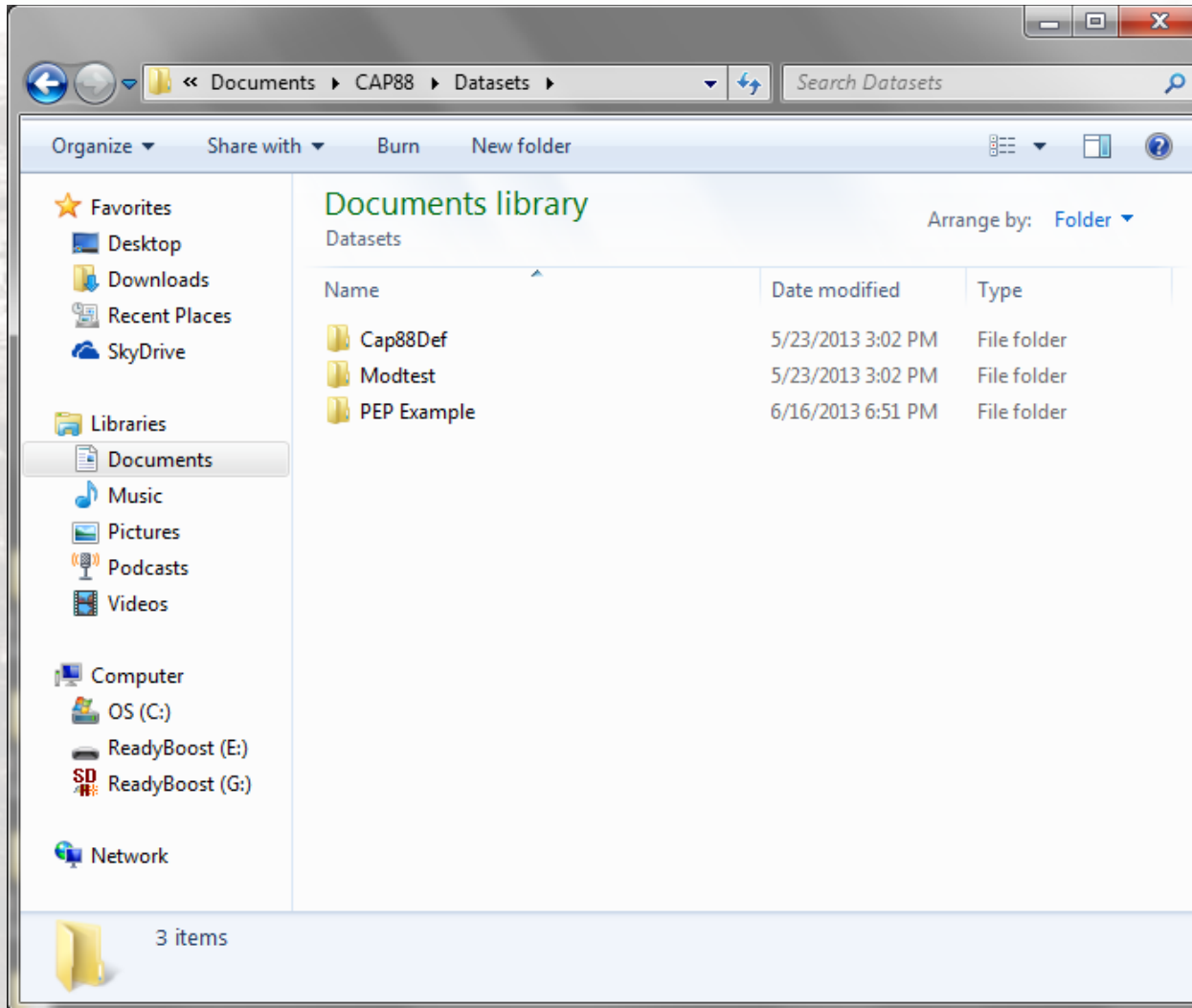
CAP88 DATA FILE STRUCTURE

- User files, including wind and population files, are stored by default in a folder in the user's Documents Library/Folder

- The location where CAP88 stores files by default can be changed using the "Options" windows accessed through the "Tools" menu.

- Inputs are stored in a text file (with a .dat extension)

- Outputs are stored also stored in a text files (with .syn, .gen, .wea, .fac, .sum, .com, and .chi extensions)
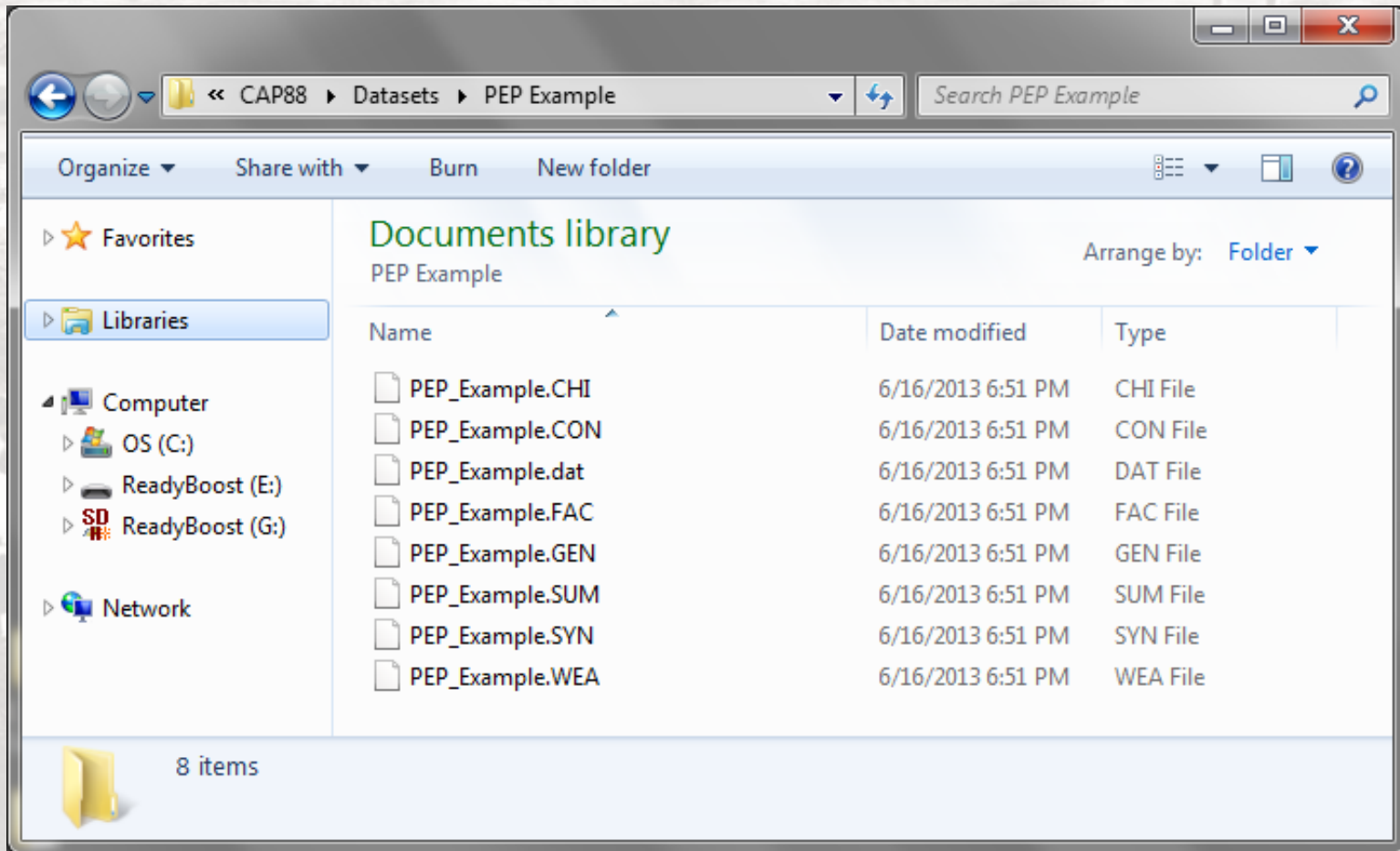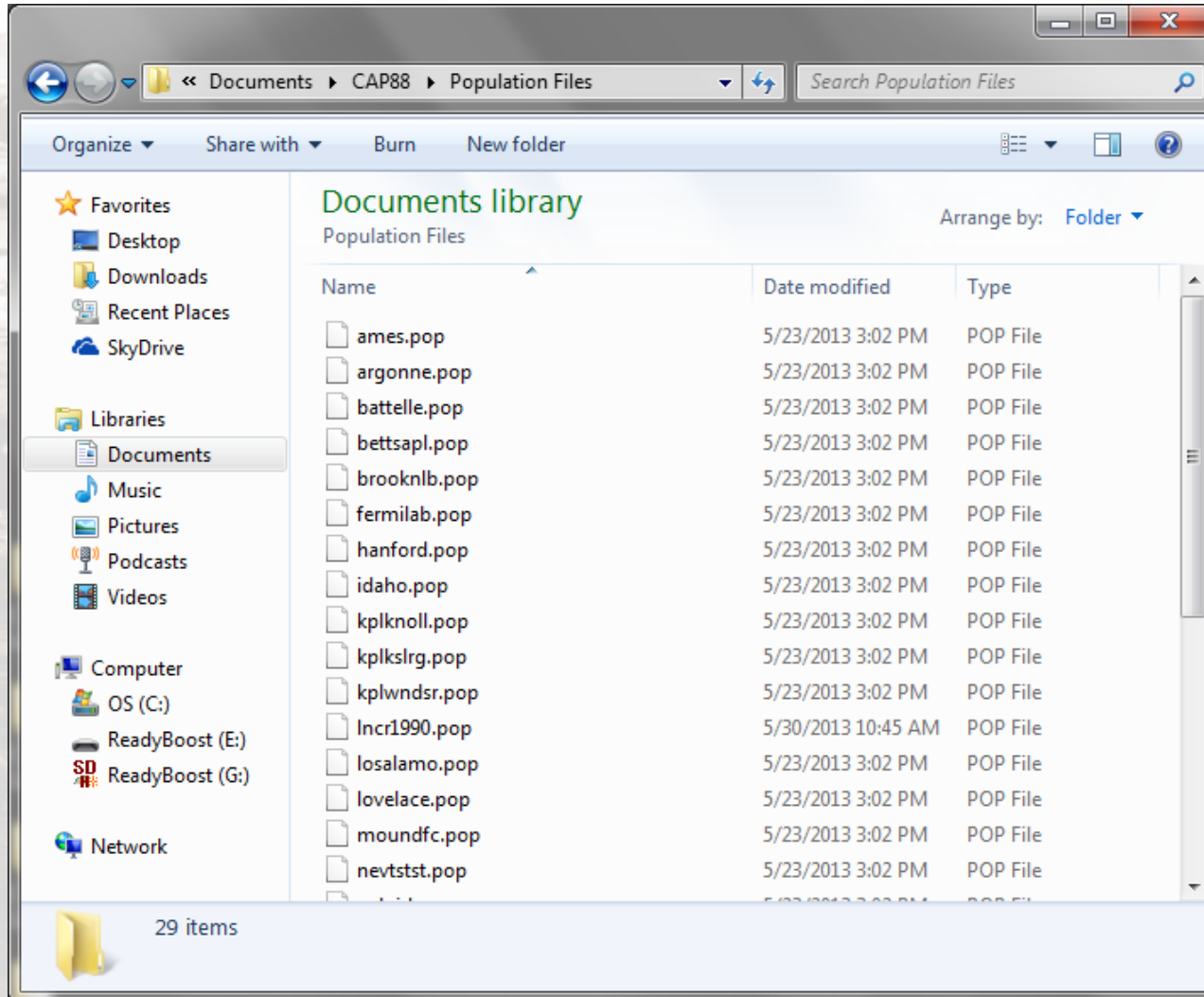
CAP88 Documents Folder

CAP88 Datasets Folder

CAP88 Dataset File & Output Reports

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CAP88 POPULATION FILES FOLDER

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CAP88 Wind Files Folder