

# NeuBrew

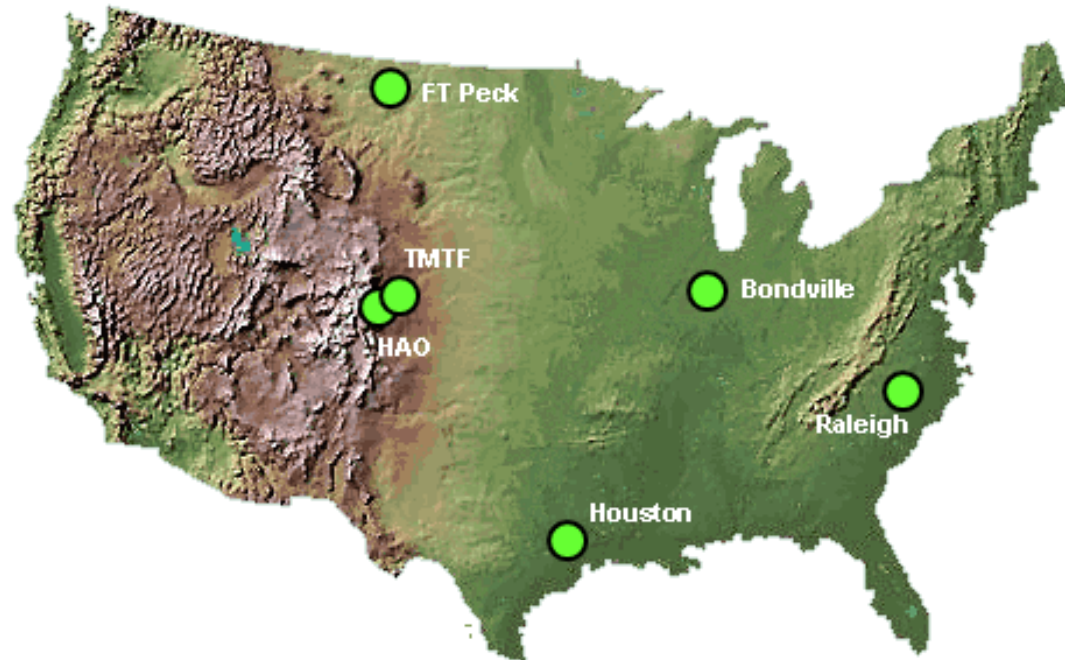
STSM Boulder, CO

- Overview
  - Brewer Networks
    - NeuBrew
      - David Skaggs Research Center (Boulder, CO)
    - EuBrewNet
      - Izaña Atmospheric Research Center (Tenerife, Spain)

- Introduction
- System Description
  - Web Service
- Data Transmission
- Database
- Products Generation
- Quality Assurance
- Comparison

- Introduction
  - Network of Brewer Spectrophotometers
  - Western, Central and Eastern (US)
  - Measurement
    - Daily Ultraviolet Radiation
    - Total Column Ozone
  - Other equipment
    - Total Surface Radiation Budget
    - Total Sky Imagers

- Introduction



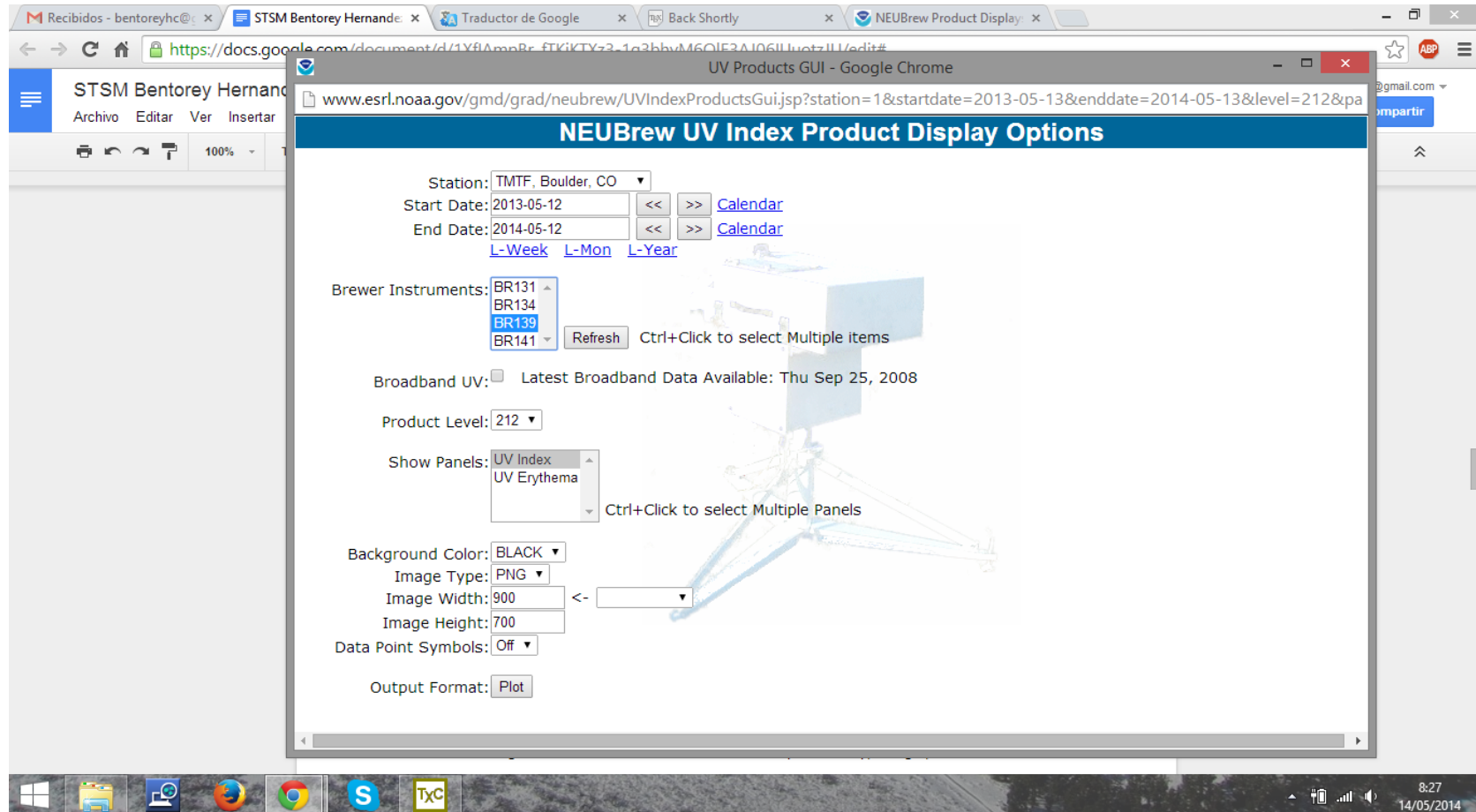
NEUBrew Network Stations

- System Description
  - Centralized server
    - Quad core
    - 16 Gigabytes RAM
    - Hard Drive: 1.8 Terabytes
  - Os: Centos (Client and Server)
  - Backups taken every night
  - Not oriented to real time

- Web Service
  - Java + HTML
  - Apache Tomcat + Servlets

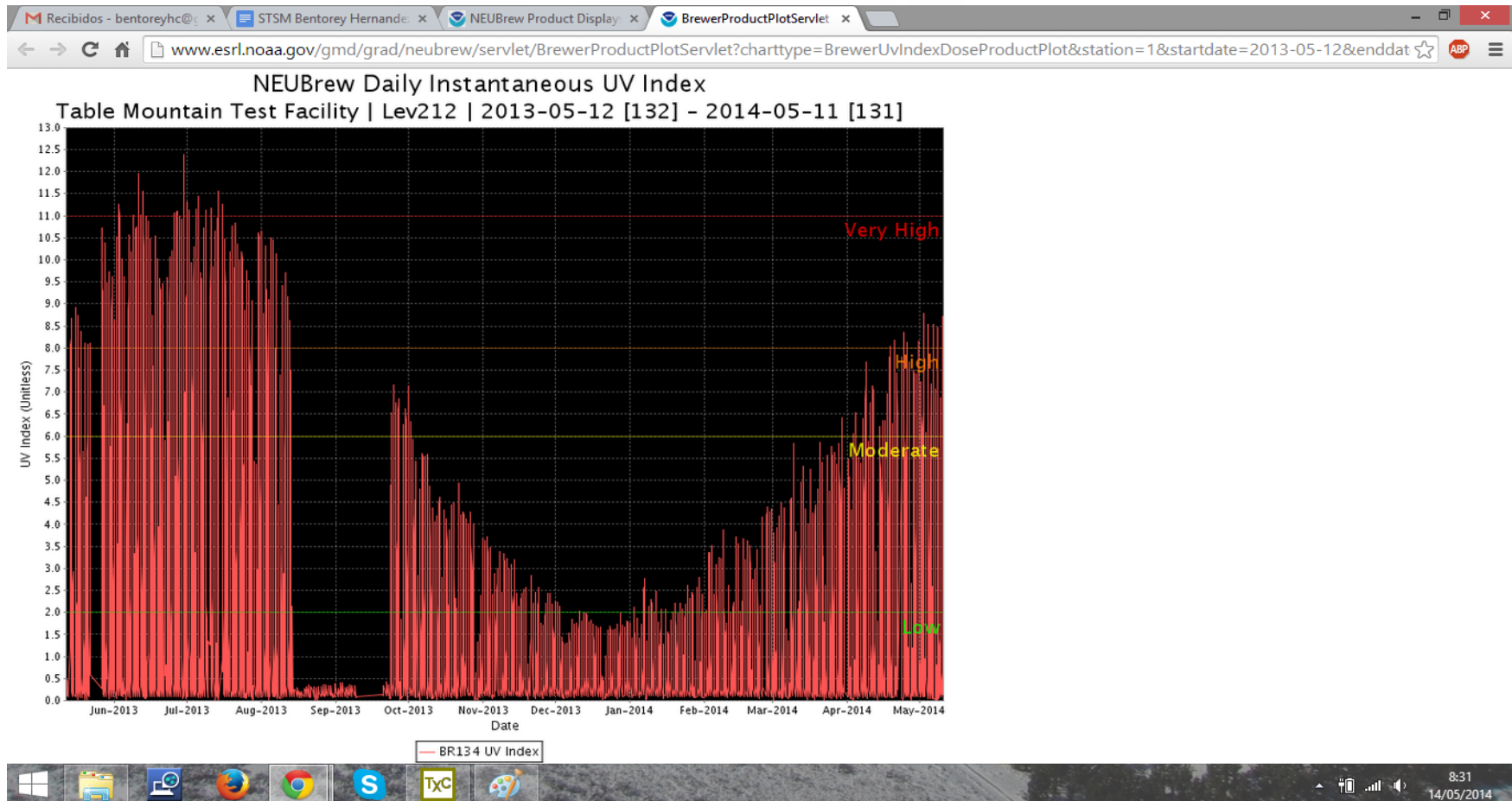


- Web Service





- Web Service



- Data Transmission
  - Server Request
    - SSH communications
  - Sequential mode
    - One Brewer at a time
  - Communication problems
    - Poorly communicated areas

- Database
  - PostgreSQL (pgAdmin)
  - Data Issues:
    - Station
    - Very descriptive column names
    - Use of tables for logic behaviour
    - Configuration of Communications
    - Different data levels and product generation
    - Contacts

# • Database

## TABLE stations

Fields:

"Latitude" and "Longitude" (**real**): Position of the station  
"Elevation" (**real**): Position of the station  
"Local Timezone" (**character varying(30)**): Timezone  
"Phone", "Address", "Fax", "Mail Code"...

## TABLE brewer

Fields:

"Notes" (text): Description and information  
"Active" (**boolean**): Is the brewer active  
"In Network" (**boolean**): Connected to the network

# • Database

## **TABLE** bfile\_scan

Fields:

"Scan Type" (**character varying(6)**): Type of scan  
"Data Timestamp" (**timestamp(0)**): Time of measure  
"Dark Count" (**integer**): Dark count  
"Raw Counts 0" (**integer**): For every raw count

## **TABLE** brewer\_file\_status

Fields:

"File Size" (**bigint**): Size of the received file  
"Brewer UID" (**character varying(6)**): Name of the brewer  
"File Imported into DB" (**Boolean**): Inserted without problems

# • Database

**TABLE** brewer\_ingest

Fields:

"Connect Method" (**character varying(50)**): Internet or dial  
"Transfer Protocol" (**character varying(10)**): FTP, XMODEM..  
"IP Address" (**character varying(30)**): IP address of the client  
"Server Port" (**character varying(10)**): Port for communication (20)

**VIEW** active\_brewer\_info

Fields:

"Station Name", "Lat", "Long", "Elevation", "Active", "Installed date"

Tables:

"brewer", "deployment", "station"



- Products Generation
  - UV Index and UV Erythema
    - From single day to multiple years
    - Comparison by Brewers and Climate Prediction St.
  - UV Irradiance
    - Daily time series
    - Seven discrete wavelength
  - UV Spectral Scans
    - Daily UV Spectral Scan
    - AM, PM or Both

- Products Generation
  - Ozone Time Serials
    - Daily Total-Column Ozone
    - TOMS/OMI Ozone Level satellite data
  - Tropospheric Ozone time series
    - Umkehr Vertical Profile dataset
  - Ozone Vertical Profiles
    - Umkehr scans

- Quality Assurance
  - Data processed by the administrator
  - No automatic way
  - Some graphics tools showing reception information
    - Blanks
    - Medium size of files
  - Last six days of Ozone and UV Index and Erythema

- Quality Assurance
  - Comprehensive daily report
    - Experimented administrator
    - Tables in plain text and messages
  - ICFs historical from the beginning
    - Daily backup

- Diagnostic
  - More than twenty five different displays
    - Langley Regression Analysis tool
      - Step by step
    - Brewer UV spike detection and correction
      - Percentage of spikes in UV spectra
    - Brewer Multi-instrumental Display
      - From all brewers in a single page
    - Ozone QC Level Diagnostic
      - Differences between data levels

- Comparison

NeuBrew	Iberonesia
Network not prepared for solving real time issues	Network oriented for receiving and processing data in real time
Use of a physical server placed in a laboratory	Use of virtual machines and cloud computing
Designed for running in a centralized server	Designed for having the possibility to be distributed.
Very extended monitoring system for human operators	Reduced monitoring system based in logs and status messages
Graphical information generated in execution time extracting different data levels from database	Graphic information stored in file system
Use of a reduced number of different technologies	Big amount of different technologies for solving several issues
Data transferred by server requests in a scheduled way	Client oriented data transmission depending on local schedules



# Questions and Answers

Thank you for your attention