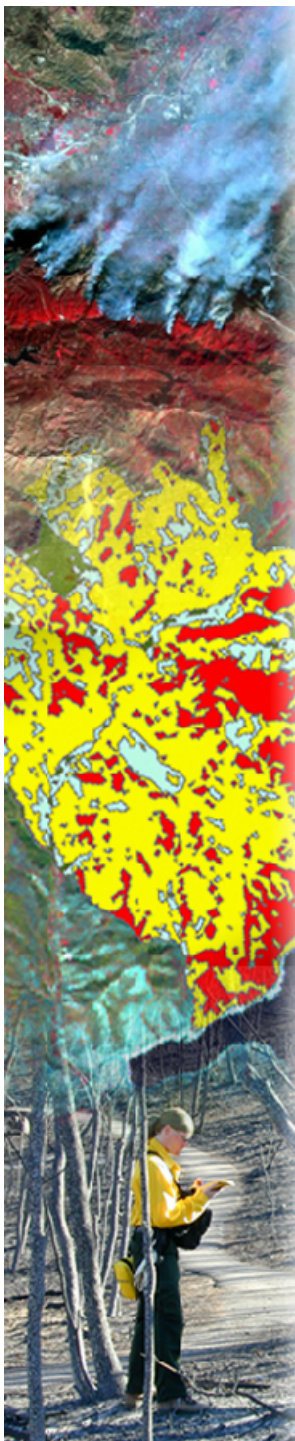
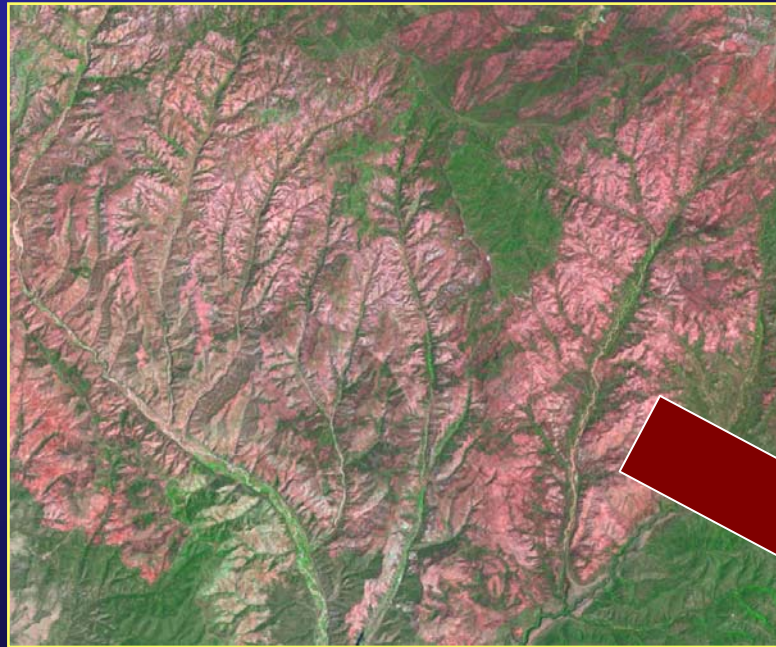


Deriving the BARC from Satellite Imagery

Demonstration Using ERDAS Imagine

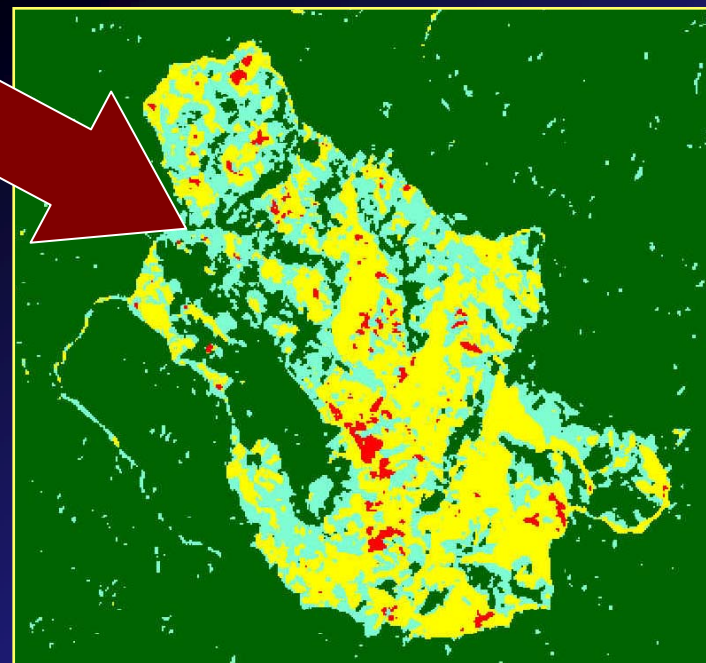


Deriving the BARC from Satellite Imagery



Rodeo – Chediski Fire 2002 Landsat 7
ETM + Imagery

French Fire 2004 BARC Dataset



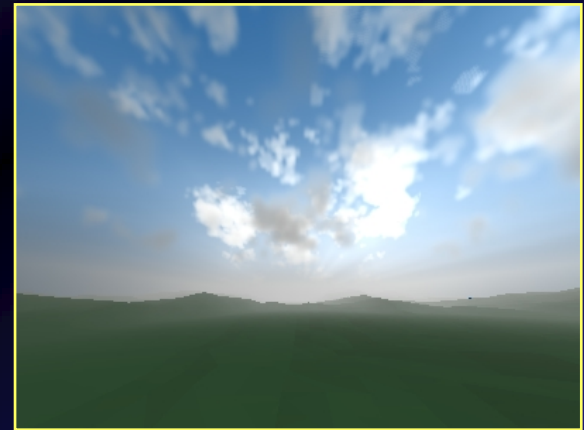
Overview: Pre-processing

Step 1: Pre-processing

Import (pre and postfire)



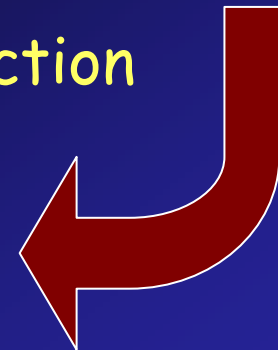
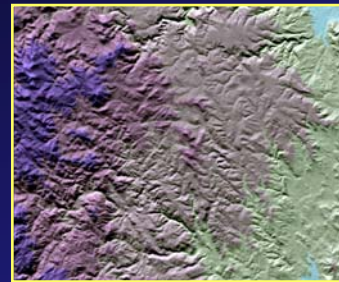
Atmospheric Correction



Subset

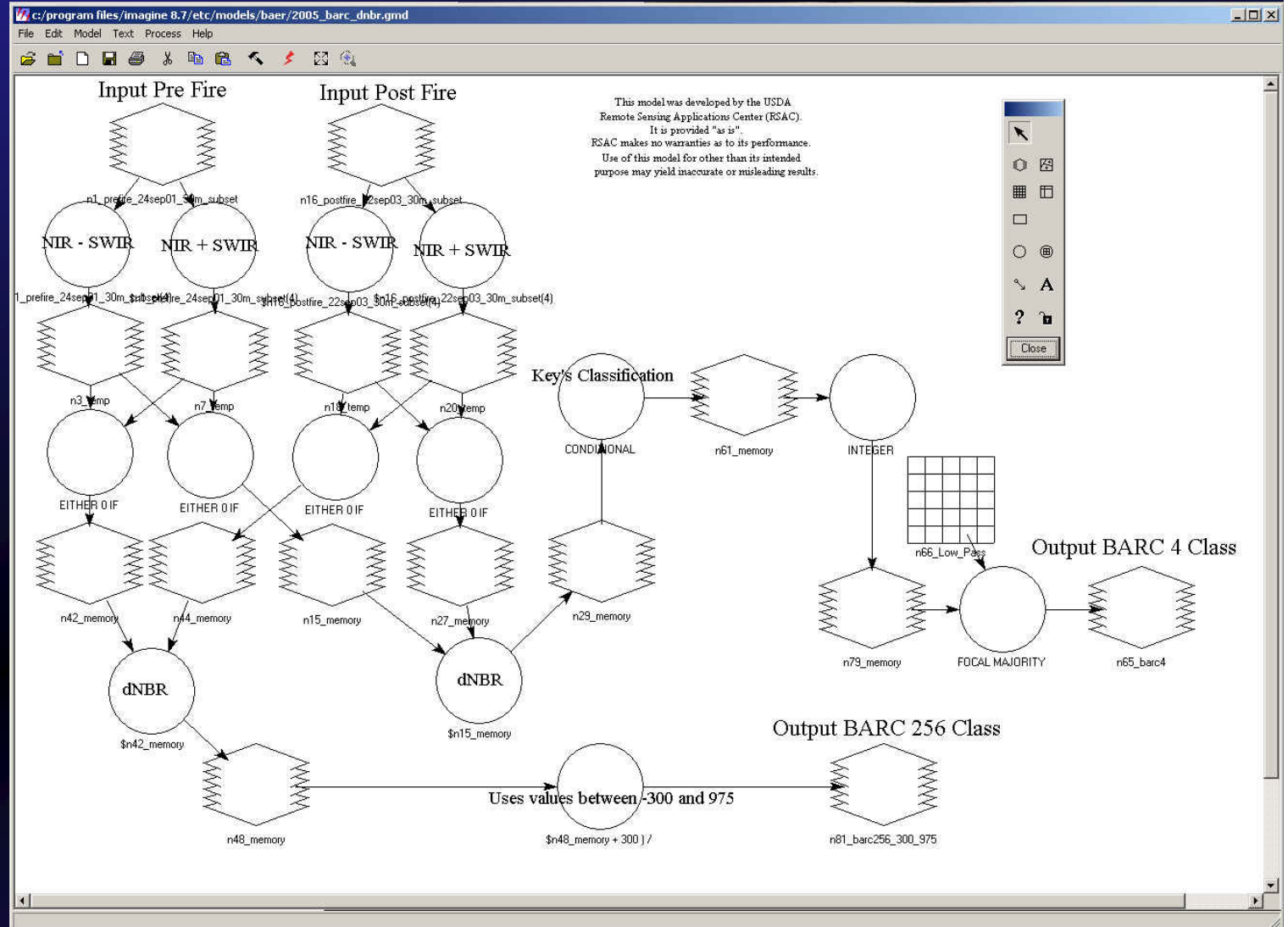


Terrain Correction



Overview: Modeling

Step 2: Modeling



Overview: Post-processing and Delivery

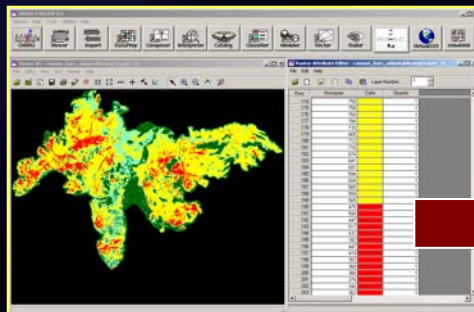
Step 3: Post-processing and Delivery

Email

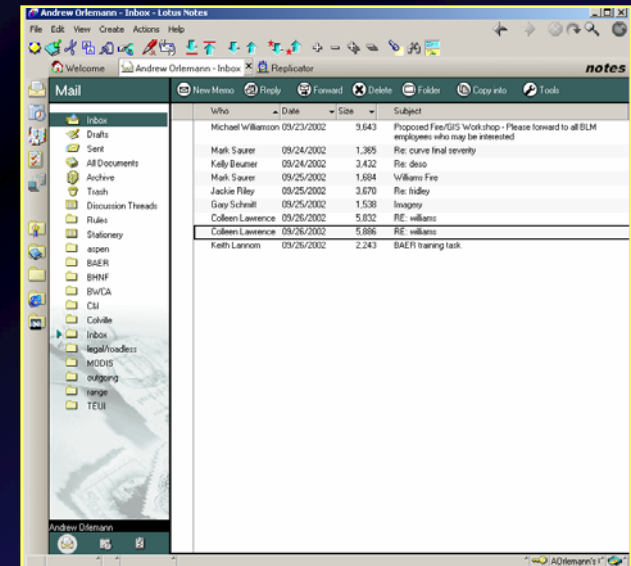
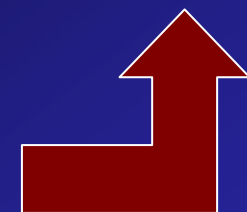
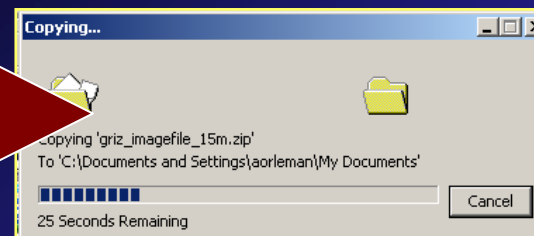
Reprojection



Coloring

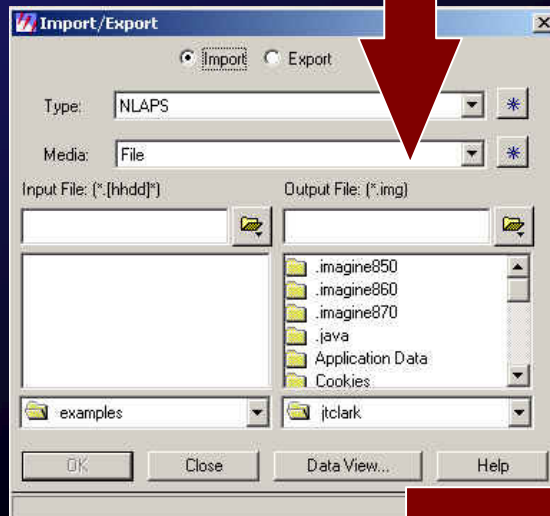
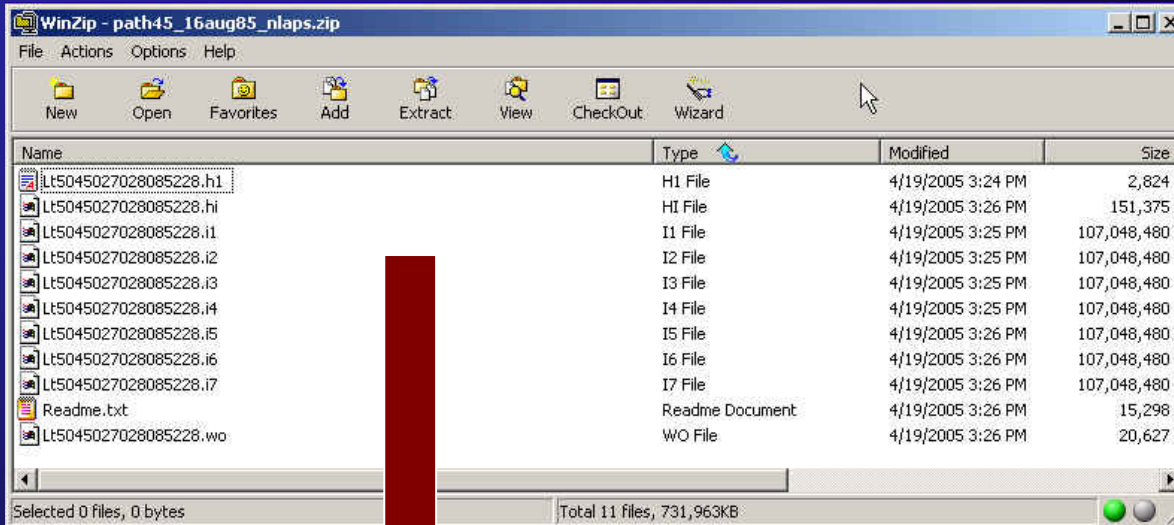


FTP

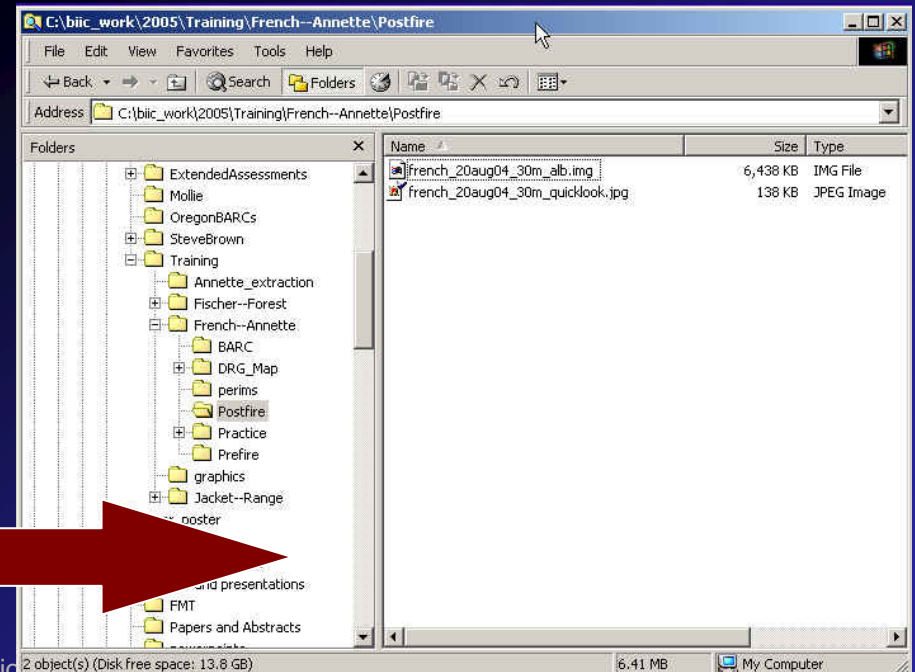


1: Pre-processing - Import

Raw data come in NLAPS format from the USGS



Using ERDAS Imagine, we import the imagery into *.img format



1: Pre-processing - Atmospheric Correction

Eccentricity Correction Factor

COMPUTE THE ECCENTRICITY CORRECTION FACTOR FOR LANDSAT IMAGERY


IMAGE ACQUISITION DATE

MONTH: April DAY: 1

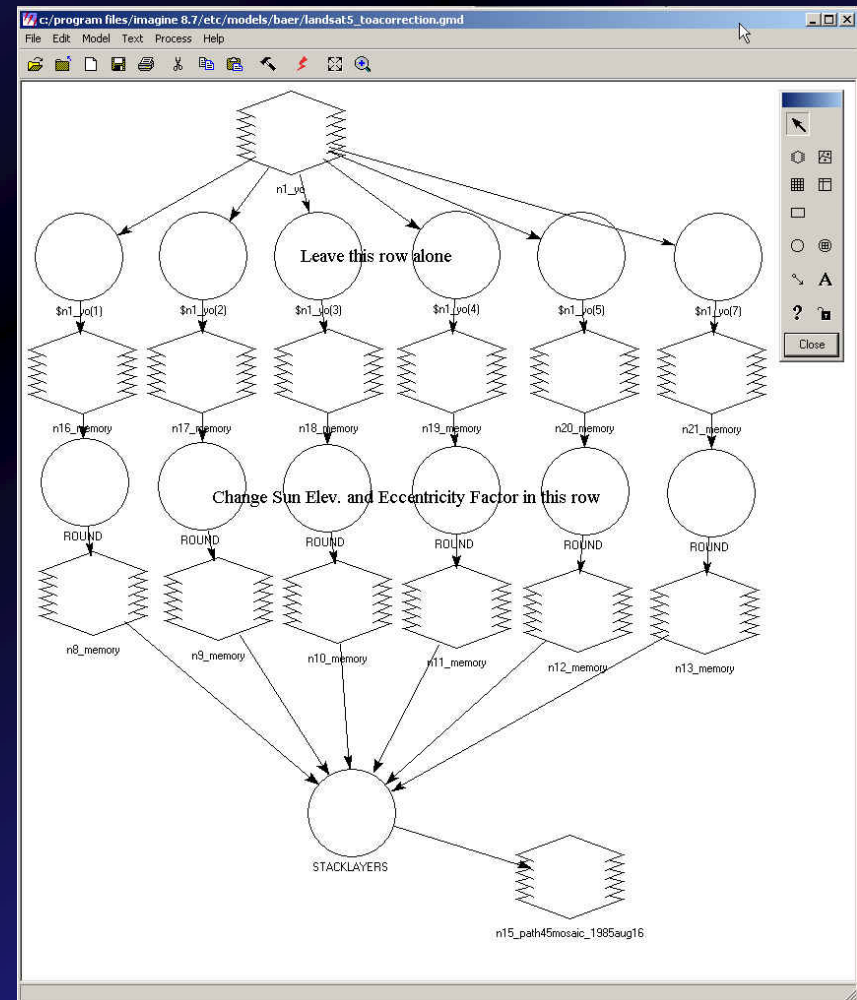
COMPUTE

EXIT

Developed by Jess Clark
(jtcclark@fs.fed.us; 801-975-3769)



Accounting for sun angle and other atmospheric variables, we perform a top-of-atmospheric reflectance correction on Landsat imagery.



1: Pre-processing - Terrain Correct

Not necessary for Landsat imagery...

ERDAS IMAGINE 8.7

Viewer #2: potpeak_12aug04_aster_30m_corrected.img (Layer_6)(Layer_3)(Layer_2)

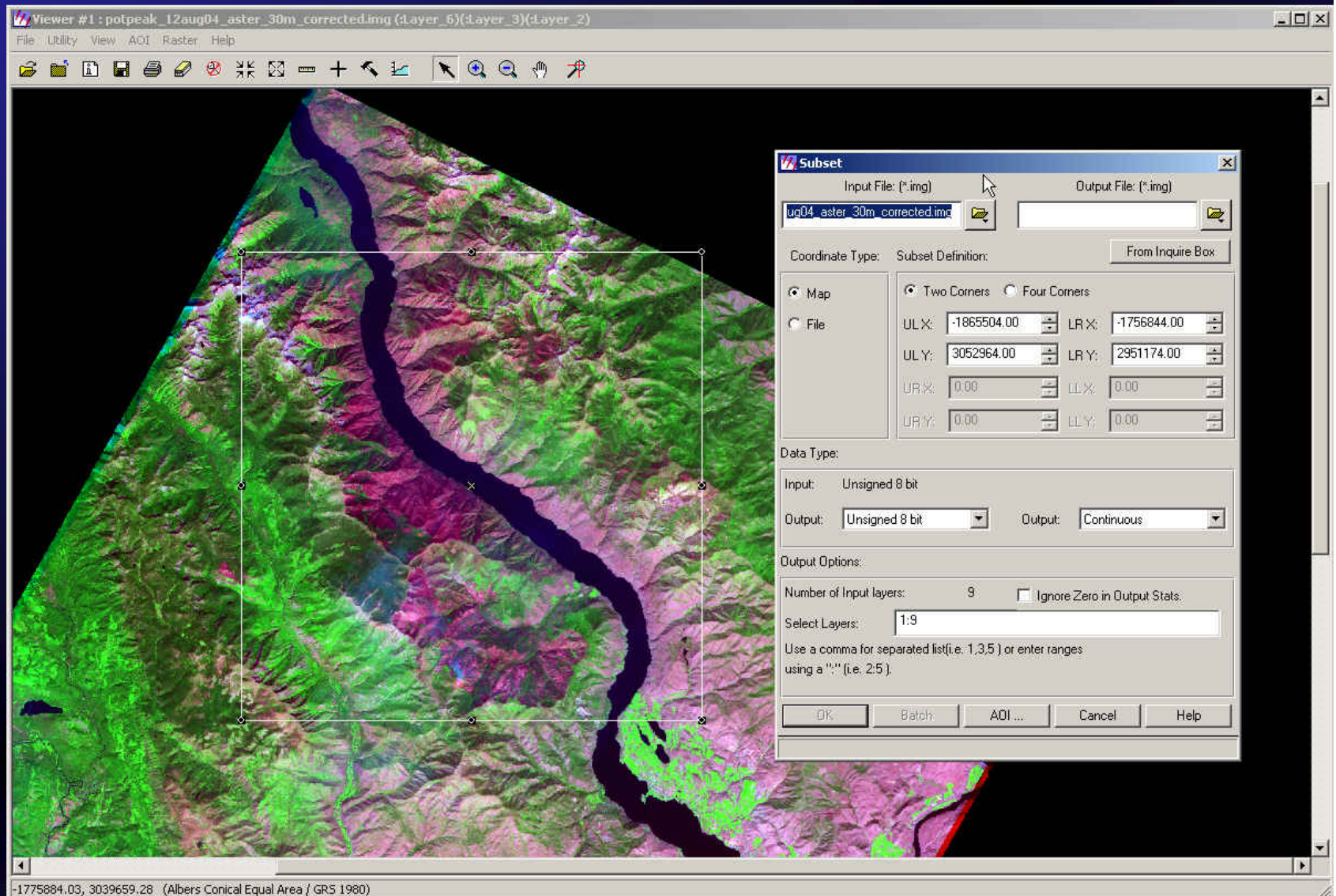
Viewer #1: 4527_22jul02_30m_albers.img (Layer_6)(Layer_4)(Layer_3)

GCP Tool: (Input: potpeak_12aug04_aster_30m_corrected.img) (Reference: reference.gcc)

Point #	Point ID	Color	X Input	Y Input	Color	X Ref.	Y Ref.	Type	X Residual	Y Residual	RMS Error	Contrib.	Match
14	GCP #14	Yellow	-1800829.755	2999896.674	Cyan	-1800959.363	2999895.877	Control	-4.845	-14.941	15.707	0.545	
15	GCP #15	Yellow	-1793336.770	3012434.925	Cyan	-1793442.810	3012441.229	Control	-0.138	-2.456	2.460	0.085	
16	GCP #16	Yellow	-1793091.502	3024684.373	Cyan	-1793234.595	3024705.079	Check					
17	GCP #17	Yellow	-1823842.314	3025167.709	Cyan	-1823904.632	3025121.509	Control	21.965	-25.038	33.307	1.155	
18	GCP #18	Yellow	-1832787.666	3020681.290	Cyan	-1832857.868	3020661.605	Control	30.910	4.966	31.307	1.086	
19	GCP #19	Yellow	-1810766.604	3013071.136	Cyan	-1810849.565	3013065.873	Control	7.574	5.336	9.265	0.321	
20	GCP #20	Yellow	-1805462.335	3004329.736	Cyan	-1805623.374	3004362.495	Control	-52.046	-35.613	63.064	2.187	
21	GCP #21	Yellow	-1820221.039	3029660.619	Cyan	-1820330.696	3029668.015	Control	-35.892	26.075	44.364	1.539	
22	GCP #22	Yellow			Cyan			Control					

1: Pre-processing - Subset

We create the BARC on a square subset



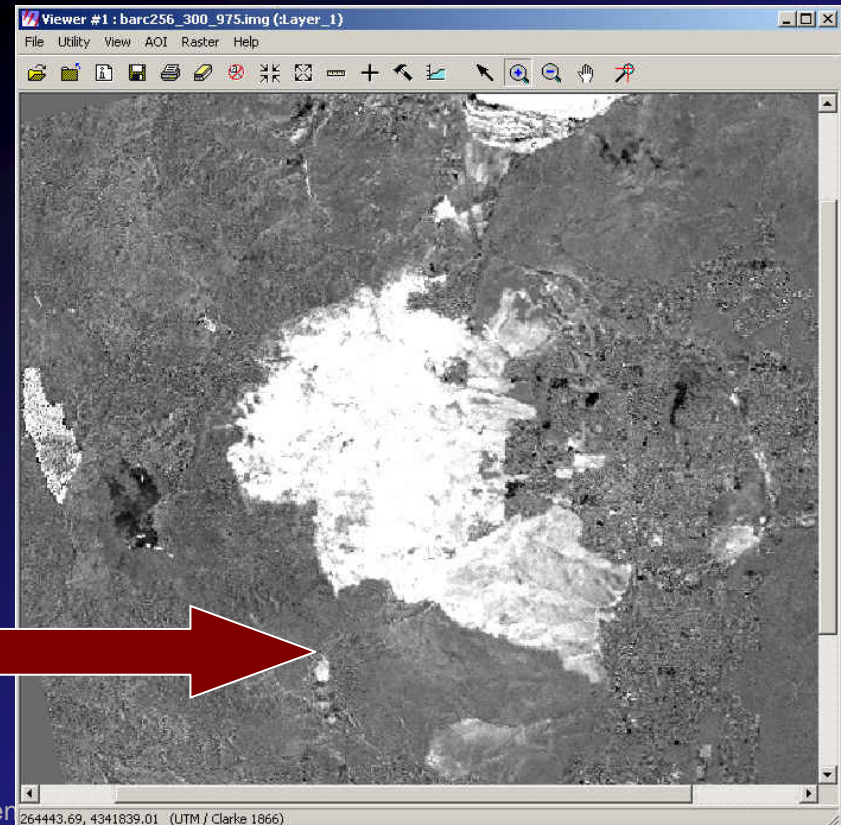
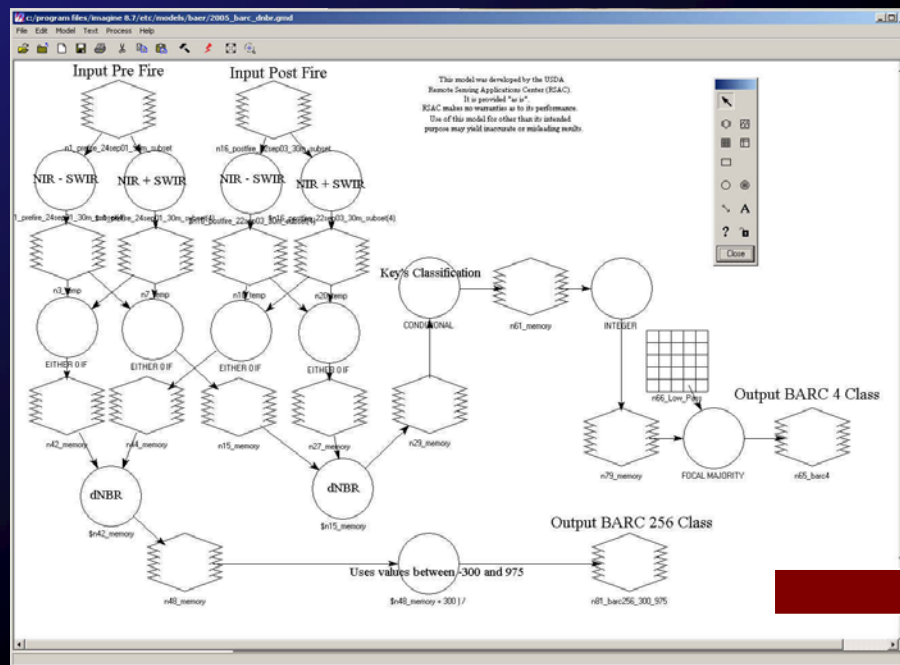
2: Modeling

Normalized Burn Ratio (NBR)

$$\text{NBR} = (\text{NIR} - \text{Mid IR}) / (\text{NIR} + \text{Mid IR})$$

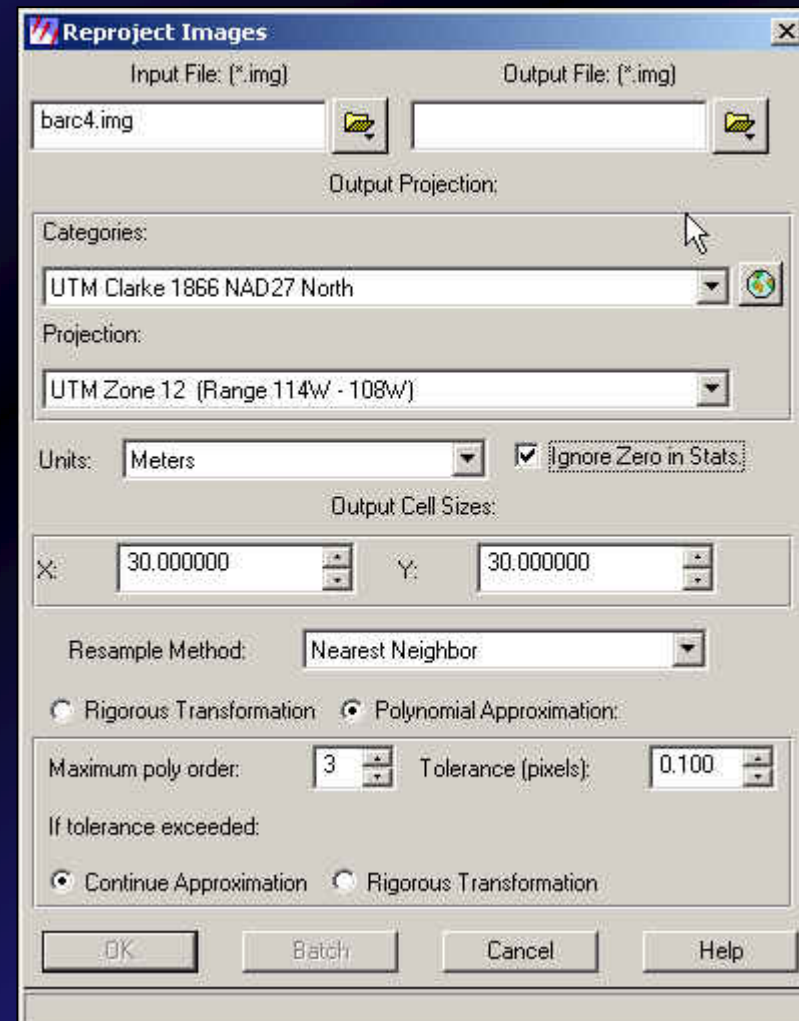
Differenced Normalized Burn Ratio (dNBR)

$$\text{dNBR} = \text{Pre NBR} - \text{Post NBR}$$



3: Post-processing - Reproject

We do all our processing in Albers Conical Equal Area projection. We then reproject the delivered products to the projection needed by the end user.



3: Post-processing - Coloring

We color all the classes as an initial classification for end users

Green = Unburned / Very Low

Aquamarine = Low

Yellow = Moderate

Red = High

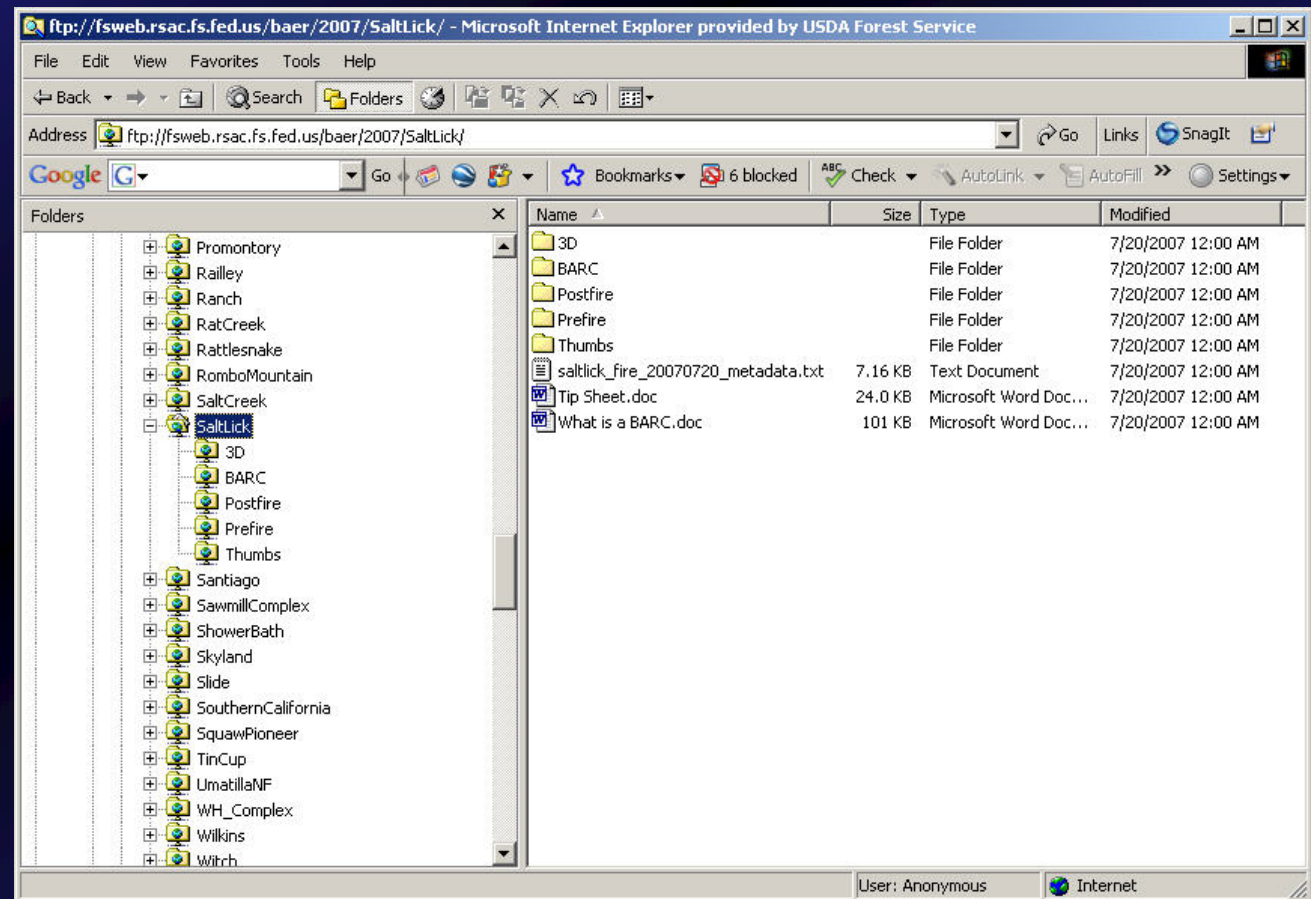
The screenshot displays the ERDAS IMAGINE 8.5 interface. The main window shows a raster map with a color-coded legend. The map is divided into several regions, with colors ranging from green to red. The legend on the right side of the map window lists the following values and colors:

Row	Histogram	Color	Opacity
174	750	Yellow	1
175	758	Yellow	1
176	760	Yellow	1
177	784	Yellow	1
178	733	Yellow	1
179	665	Yellow	1
180	712	Yellow	1
181	716	Yellow	1
182	674	Yellow	1
183	641	Yellow	1
184	601	Yellow	1
185	594	Yellow	1
186	604	Yellow	1
187	565	Yellow	1
188	559	Yellow	1
189	565	Yellow	1
190	475	Red	1
191	500	Red	1
192	447	Red	1
193	517	Red	1
194	431	Red	1
195	392	Red	1
196	447	Red	1
197	419	Red	1
198	353	Red	1
199	368	Red	1
200	366	Red	1
201	374	Red	1
202	344	Red	1
203	352	Red	1

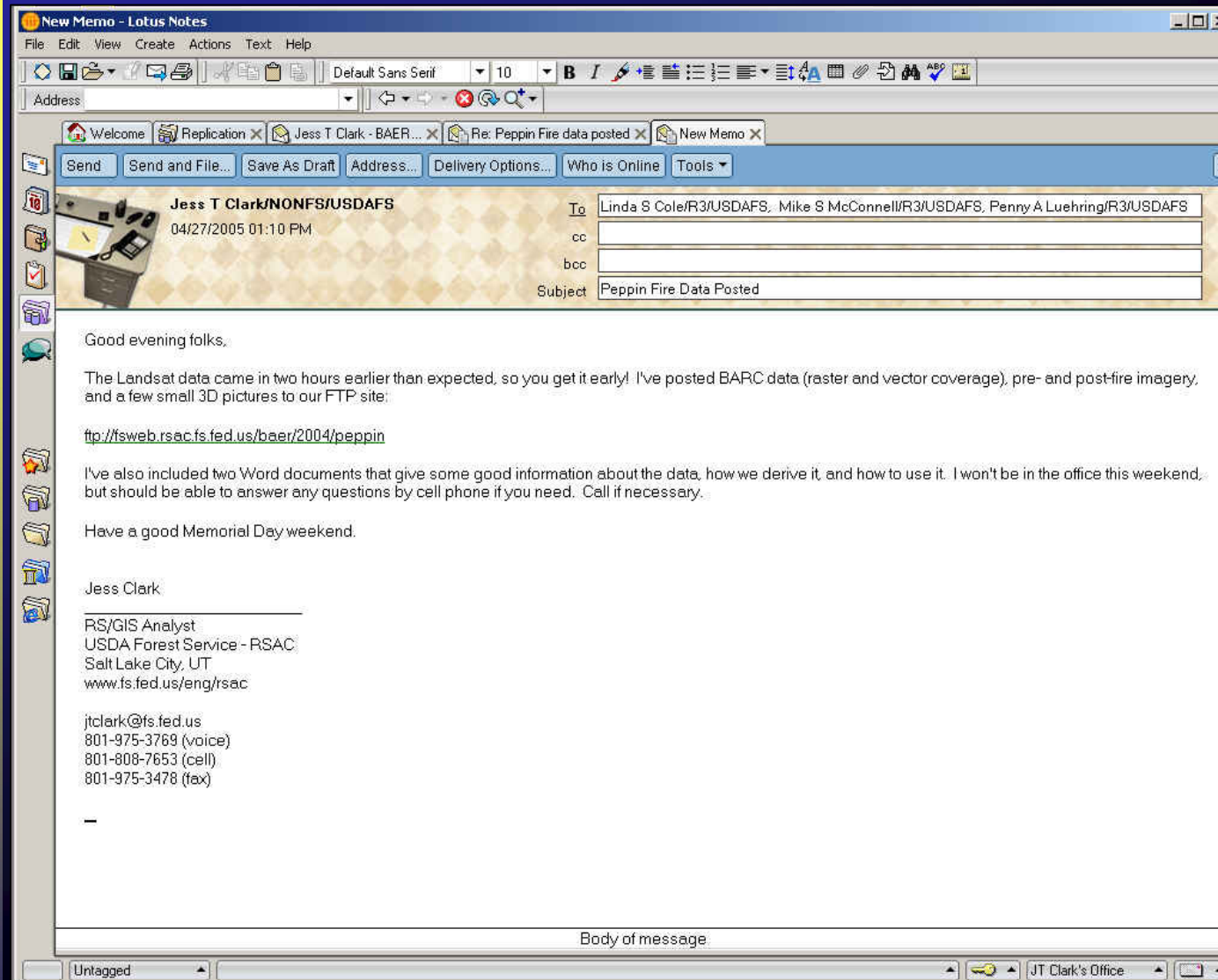
3: Delivery - FTP

Fires with Forest Service BAER teams are posted to the FSWEB FTP site. Interagency BAER teams can find their data on our public FTP server (<ftp://ftp2.fs.fed.us/incoming/rsac/baer>).

Included on the FTP site are pre- and postfire image subsets as well as the BARC datasets. Each dataset is in raster format.



3: Delivery - Email



Emails are sent out as soon as data is posted to FTP site.

Note the cell phone number. We are available on weekends and holidays via the cell phone.



The End