Proper Scene Selection:

Probably the Most important thing determining dNBR outcomes

It takes time.... Involves many considerations.... May not be possible....

- What are we trying to do?

  Identify best-matched scenes to gauge change due to fire;

  Pre-fire image provides the reference, i.e. control for post-fire change;

  Achieve parity in scene pairs; hold non-fire factors constant.

- Why?

  So burn characteristics are distinct and display maximum variation;

  Produce comparable burn maps/models.

- What's the problem?

  Burn attributes change with time (regrowth, erosion, management);

  Other surfaces change seasonally, inter-annually (phenology, snow);

  Atmosphere (clouds, haze) and solar illumination vary continuously.

Initial and Extended Assessments Relate to Post-fire Timing :

IA – As soon as acceptable data are available after burning;

EA – During first post-fire growing season.

- Each provides different challenges/benefits, and different information about fire effects . . . .

- Fire dates and seasonality must be considered to guide IA and EA timing

- IA and EA are points on a continuum that typically spans only one year, but may be compressed into a couple months. Regionally variable.

Things to remember:

Predictable regional cloudiness, e.g. June-August in the Southeast;

Predictable spatial cloudiness and snow cover, e.g. on mountains;

Moisture gradients, e.g. earlier greenup/senescence at lower elevations;

Defects visible in browse will likely be more prominent in full resolution.

Methods of work. What to do to get the best outcome:

- Know fire dates;
- Generally pick post-fire image first considering fire date, IA or EA time;
- Download browse images of possible dates;
- Don’t forget about side-lap and reviewing adjacent path(s);
- Helps to have date-sequential browse filenames;
- Side-by-side comparison using for e.g. Office Picture Manager™
  - Filmstrip mode shows full image together with thumbnails
  - Holds position and zoom settings as one steps thru images.

Choices to make if other options are available, ranked more to less important:

- Within highest sun angle window JD60 to JD285 (Mar 1 to Oct 12)
- Largest portion of burn included on scenes, not SLC-off, and no clouds
- Appropriate timing/phenology for IA or EA
- Same paired phenology, i.e. greenness, snow and soil moisture
- Paired similar sun angle
- Combustion is completely out, if IA
- Less or no haze
- Best post- fire scene selected (then match to a pre-fire scene)
- No registration issues, same path scenes with burn farthest from edge
- Scenes closer to Solstice, JD-172
- Get most burns per scene pair – similar reflectance traits between burns
- Least difference in Julian Day between scenes (phenology trumps JD)
- Images from the same sensor used in differencing
- L7 chosen if equal or better than an available L5
- Less years between pre and post (rather all above be good than worry about year gap)

Choices to avoid <u>if other options are available</u>, ranked more to less important:

- Very Low sun angle, i.e. JD355 70 = JD285 to JD60 (Oct 12 to Mar 1)
- Larger portion of burn missing – off scene, obscured by SLC-off or clouds
- Missed timing/phenology for IA or EA
- Unequal paired phenology, i.e. greenness, snow and soil moisture
- Unequal paired sun angle
- Active burning visible if IA (smoke/hot spots), will not capture whole burn
- Light haze
- Pre-fire scene drives the post-fire selection (use best post-scene)
- Registration issues, side-lapped scenes, adjacent paths, proximity to edge
- Lower sun angle – scenes farther from Solstice, JD-172
- Get fewer burns per scene pair – reflectance traits will differ between burns
- Larger difference in Julian Day between scenes (phenology trumps JD)
- Mixed L5 and L7 in differencing
- Choosing L5 over an equal or better L7
- Less years between pre and post (rather all above be good than worry about year gap)

Julian Day by Month

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
January	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
February	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59			
March	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
April	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	
May	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151
June	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	
July	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212
August	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243
September	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	
October	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
November	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	
December	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Bad Sun Angle

Equinox

Highest and Lowest Sun Angle Dates for P41/R26 (approx scene center 48.45' 113.45" @ 11:15 MST)

Marginal Sun Angle

Solstice

100-day Markers