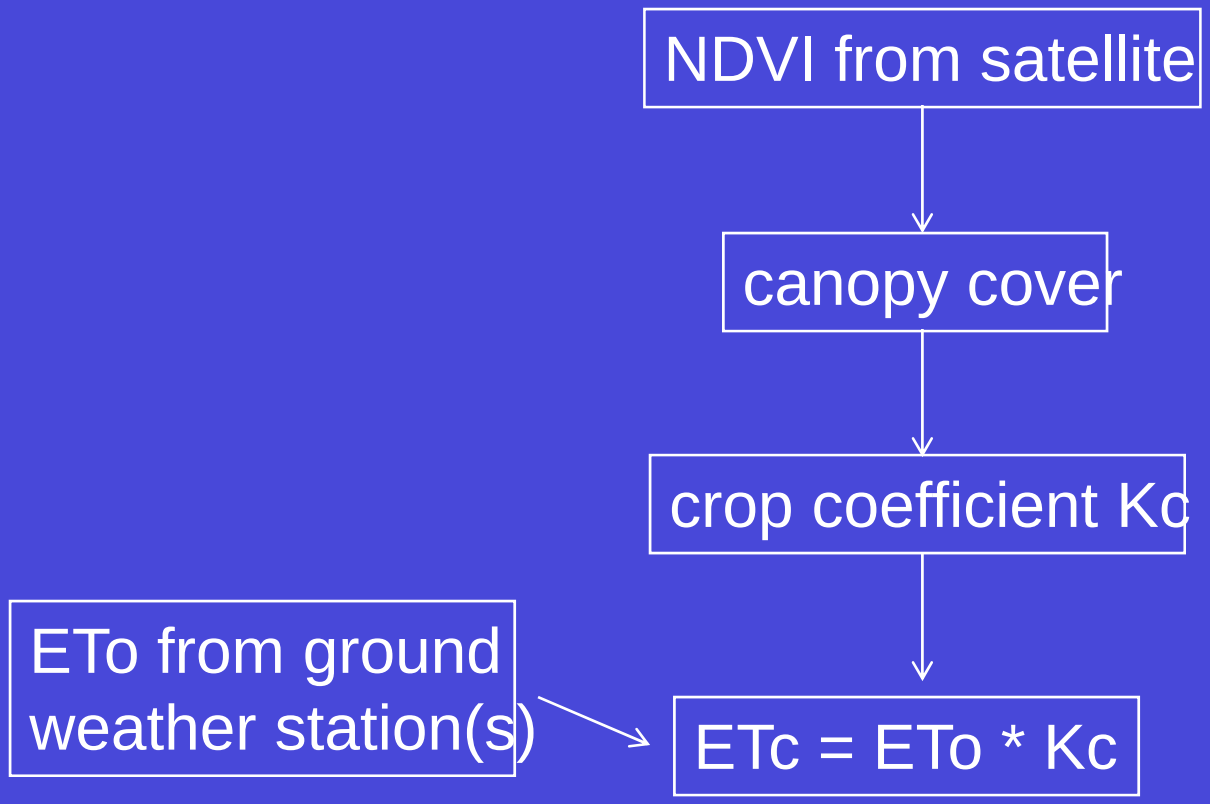
Satellite Mapping for Irrigation Management

…develop and demonstrate a prototype decision support system that can efficiently deliver crop coefficient and estimated crop water use information to agricultural producers and water suppliers…

"Reflectance-based" crop coefficients



Microsoft Excel - BlSm.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

Times New Roman 10

L18 8

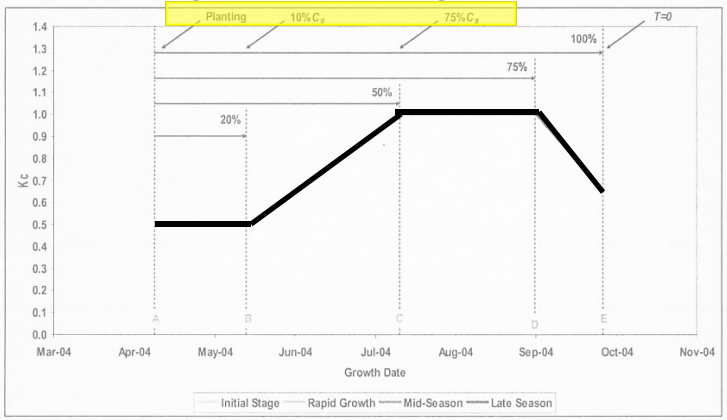
Crop Number	Crop Name	% season B	% season C	% season D	KcB	KcC	KcD	KcE	Planting Month	Planting Day	Harvest Month	Harvest Day
1.01	Alfalfa (cycle)	7	30	100	0.40	1.15	1.15	0.40	6	20	7	20
1.02	Artichokes	6	19	90	0.65	0.65	0.65	0.65	7	1	5	1
1.03	Asparagus	12	25	95	0.25	1.00	1.00	0.25	1	1	12	31
1.04	Barley	20	45	75	0.70	1.10	1.10	0.15	11	1	5	31
1.05	Beans (pinto)	24	40	91	0.20	0.90	0.90	0.10	6	15	9	30
1.06	Beans (dry)	24	40	91	0.20	1.00	1.00	0.10	6	15	9	30
1.07	Beans (green)	22	56	89	0.80	1.00	1.00	0.85	3	1	5	31
1.08	Beets (table)	25	60	90	0.30	0.90	0.90	0.90	4	1	6	20
1.09	Broccoli	20	50	83	0.30	1.00	1.00	0.80	3	15	7	1
1.10	Cabbage	25	63	88	0.30	1.00	1.00	0.85	8	1	11	15
1.11	Carrots	20	50	83	0.85	0.95	0.95	0.80	1	15	5	15
1.12	Celery	15	40	90	0.80	0.95	0.95	0.95	9	15	1	15
1.13	Corn (grain)	20	45	75	0.20	1.05	1.05	0.60	5	1	9	30
1.14	Corn (silage)	20	45	100	0.20	1.00	1.00	1.00	5	1	8	15
1.15	Cotton	15	25	85	0.35	0.95	0.95	0.50	5	15	10	15
1.16	Cucumber	19	47	85	0.80	0.85	0.85	0.85	3	15	6	15
1.17	Eggplant	23	54	85	0.80	0.90	0.90	0.85	4	1	11	15
1.18	Flax	17	45	80	0.20	1.10	1.10	0.25	4	1	7	31
1.19	Grains (small)	20	45	75	0.33	1.10	1.10	0.15	11	1	5	31
1.20	Grains (winter)	20	45	75	0.33	1.05	1.05	0.15	11	1	5	31
1.21	Lentil	24	40	91	0.20	1.00	1.00	0.10	6	15	9	30
1.22	Lettuce	25	65	90	0.80	0.80	0.80	0.80	3	15	7	15
1.23	Melon	21	50	83	0.80	0.95	0.95	0.75	4	1	11	15
1.24	Millet	14	36	75	0.30	1.00	1.00	0.30	11	1	5	31
1.25	Mustard	25	63	88	0.30	1.00	1.00	0.85	8	1	11	15
1.26	Oats	20	45	75	0.33	1.10						
1.27	Onion (dry)	10	26	75	0.55	1.20						
1.28	Onion (green)	25	70	90	0.55	1.20						
1.29	Peas	20	47	83	0.20	1.00						
1.30	Peppers	20	45	85	0.80	1.00						
1.31	Potato	20	45	78	0.80	1.10						
1.32	Radishes	20	45	85	0.80	0.85						
1.33	Rice	24	37	86	1.20	1.03						
1.34	Safflower	17	45	80	0.20	1.05						
1.35	Sisal	17	45	80	0.20	1.05						
1.36	Sorghum	16	42	75	0.20	1.05						
1.37	Spinach	33	67	92	0.80	0.95						
1.38	Squash	20	50	80	0.52	0.90						

Weather / Crop / CropRef / KcPlot1YR / KcPlot2YR / ETcPlot / CETcPlot / YTD / MakeSchedu

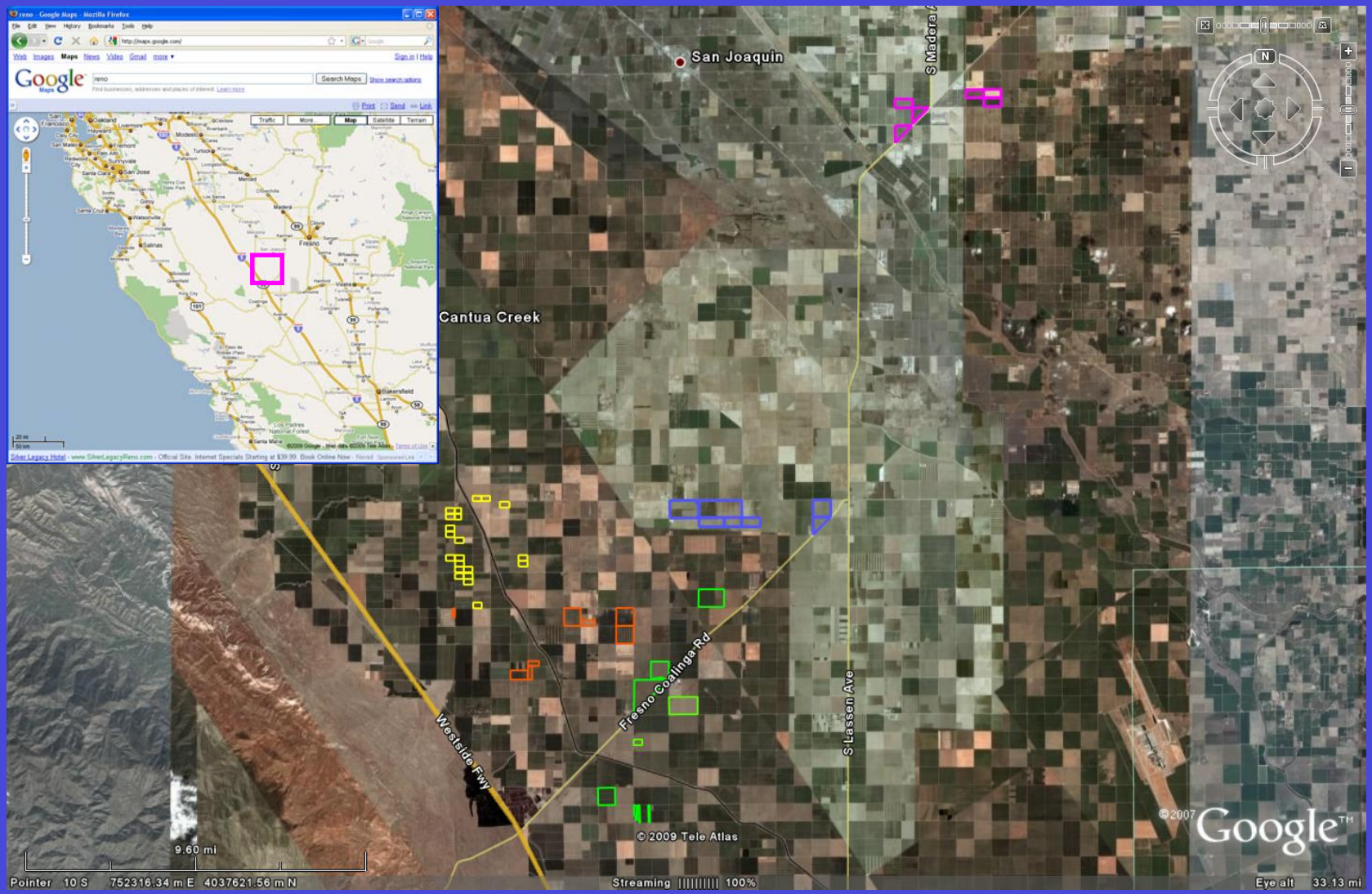
Draw AutoShapes

Ready

Figure 7
Hypothetical Crop Coefficient (K_c) Curve for Typical Field and Row Crops Showing Growth Stages and Percentages of the Season from Planting to Critical Growth Dates

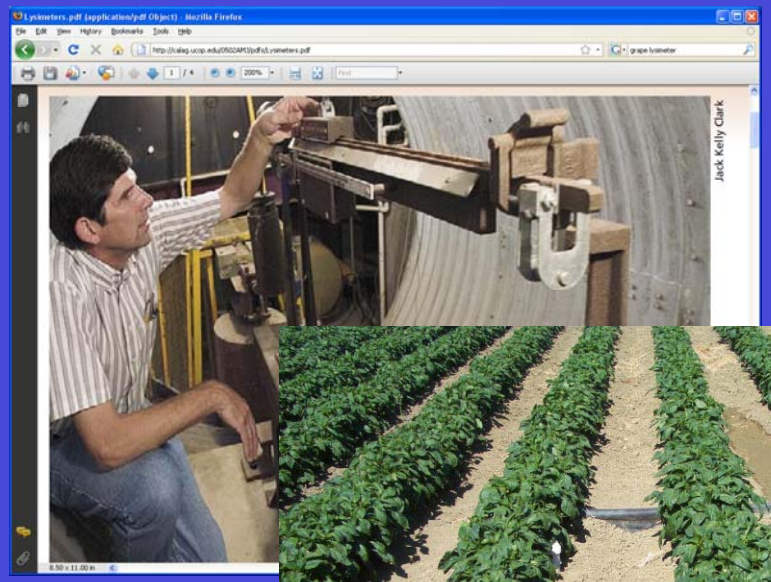


Study area


San Joaquin
S Madera
Cantua Creek
Fresno Coalinga Rd
S Lassen Ave
Westside Fwy
9.60 mi
© 2009 Tele Atlas
©2007 Google
Pointer 10 S 752316.34 m E 4037621.56 m N
Streaming 100%
Eye alt 33.13 mi

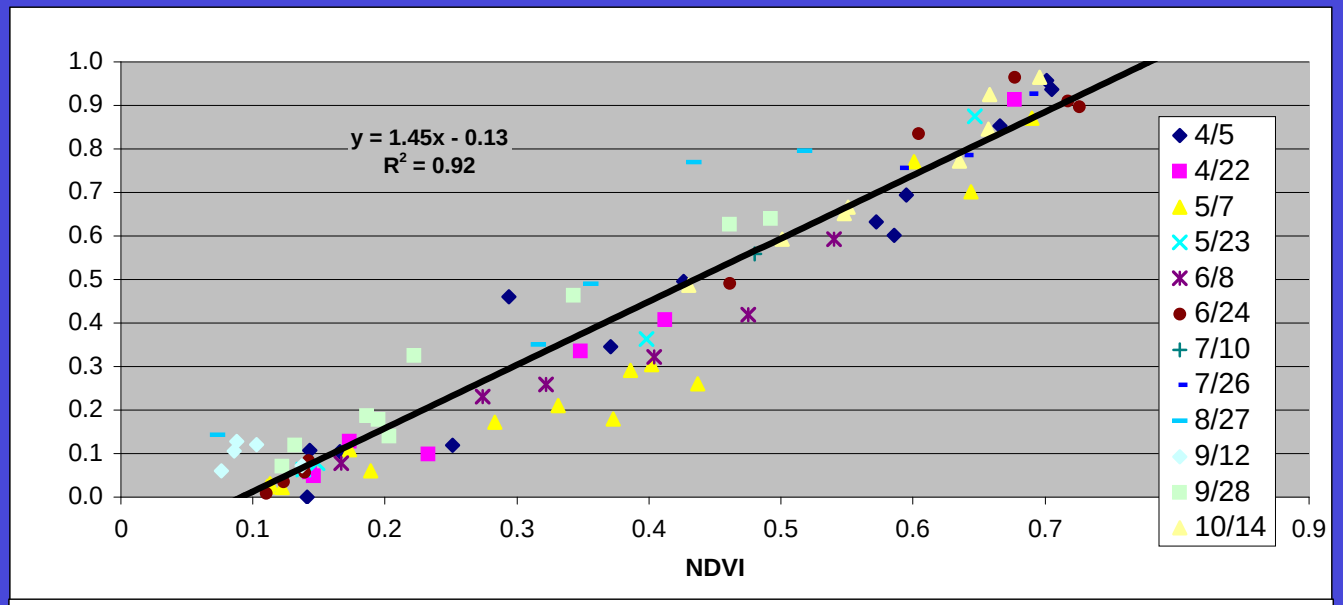
Crop cover

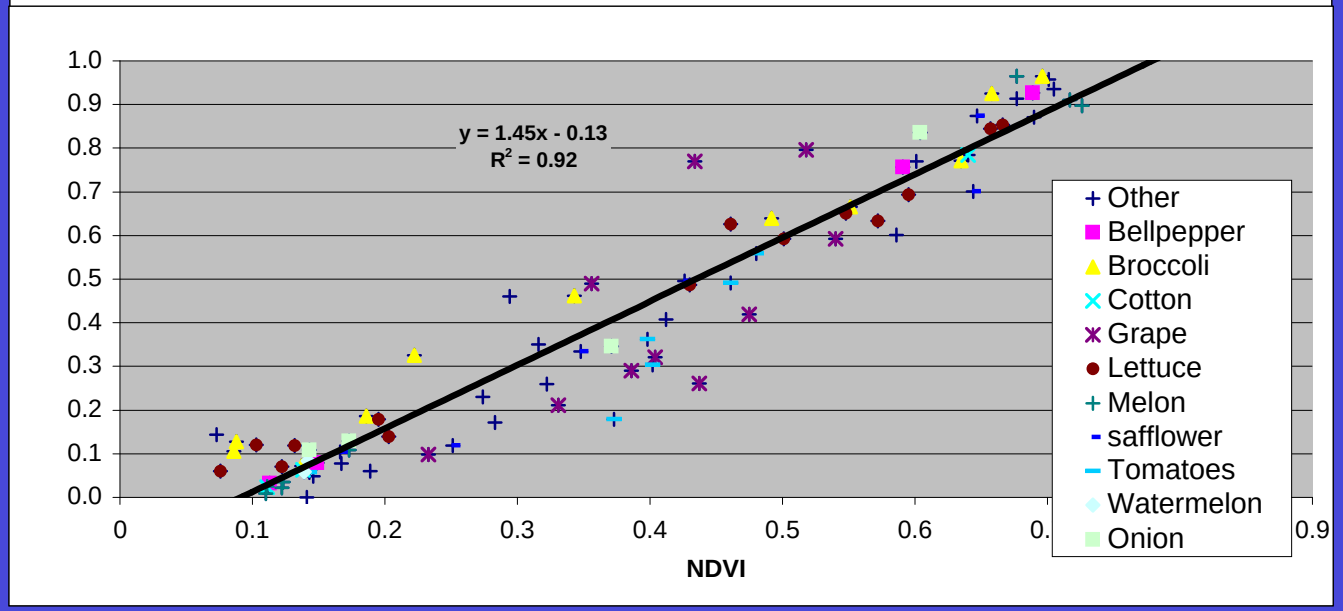
Weighing lysimeter



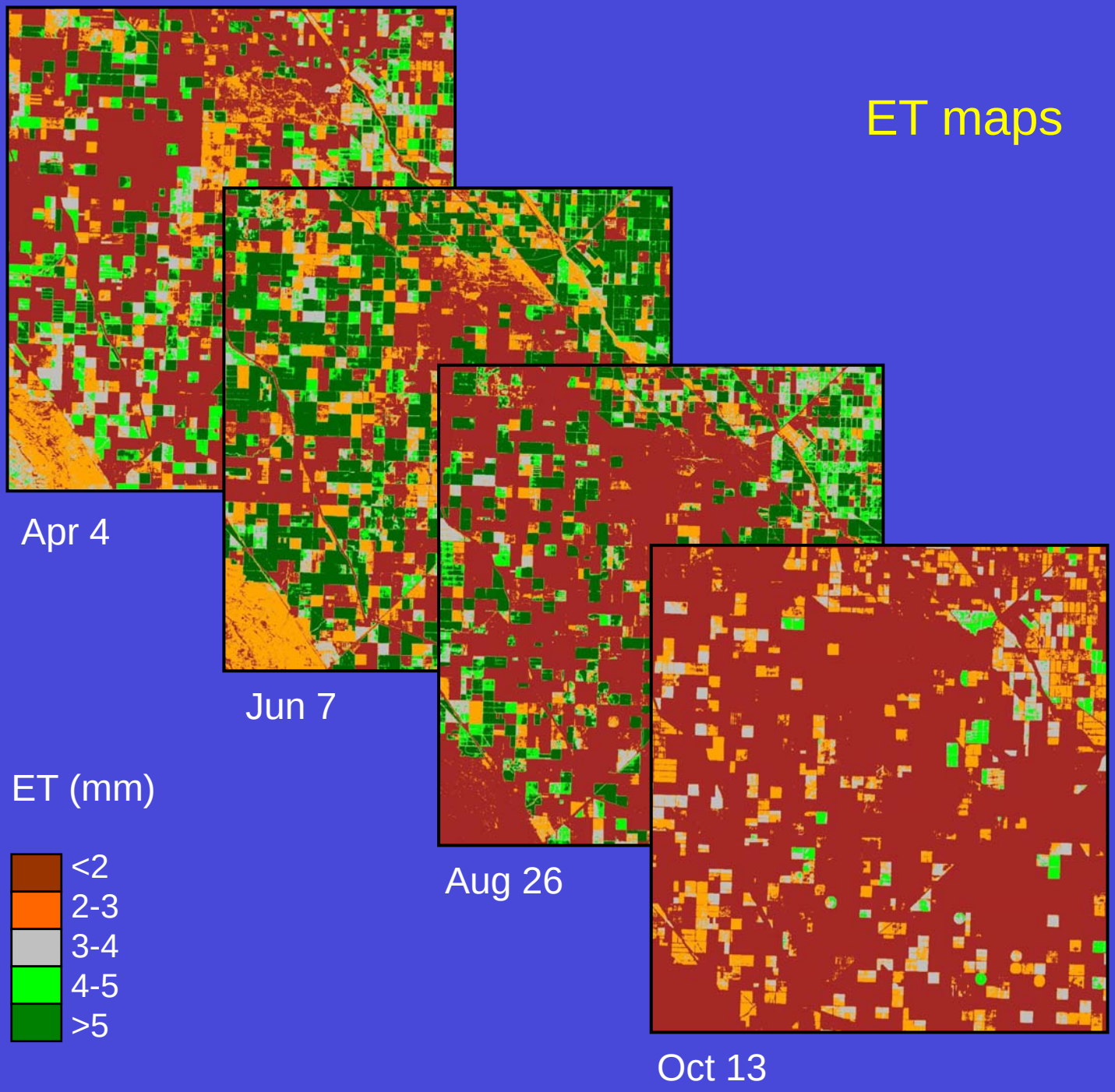
ETo

2008 results

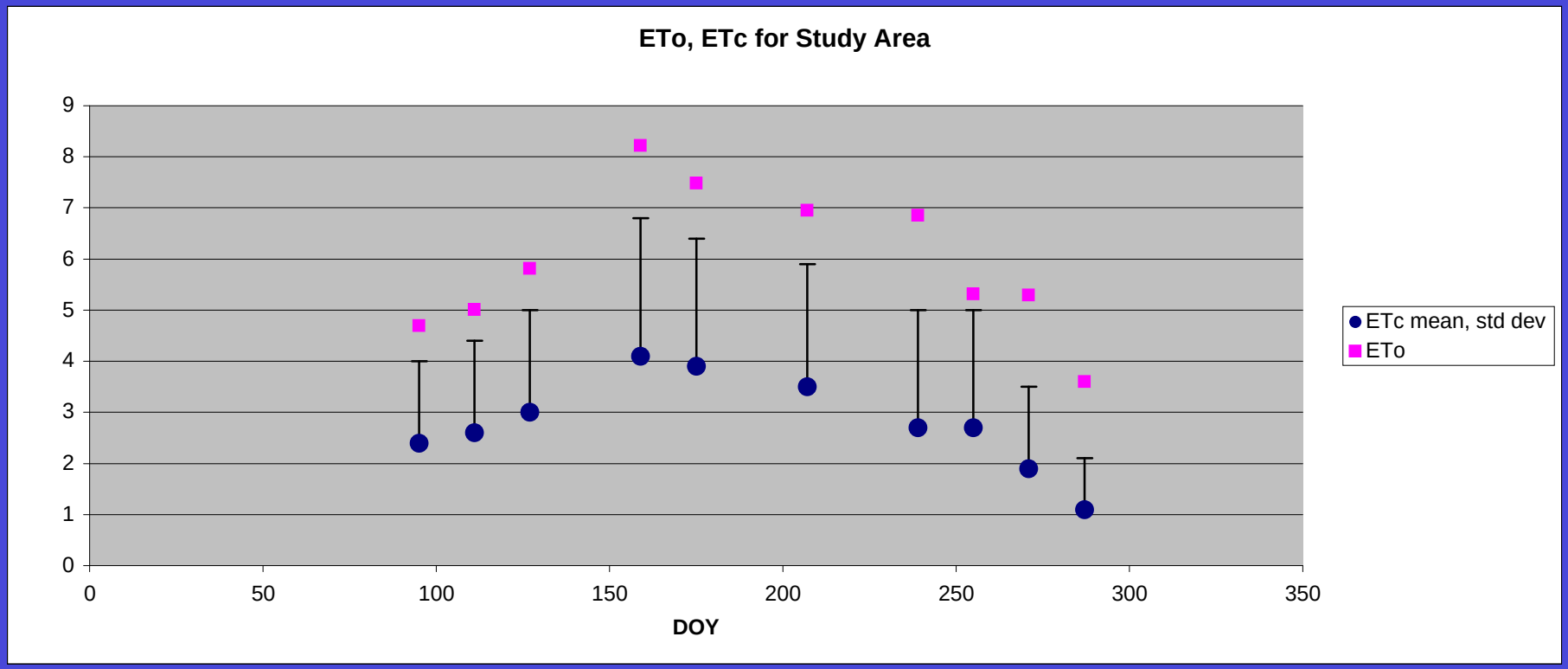




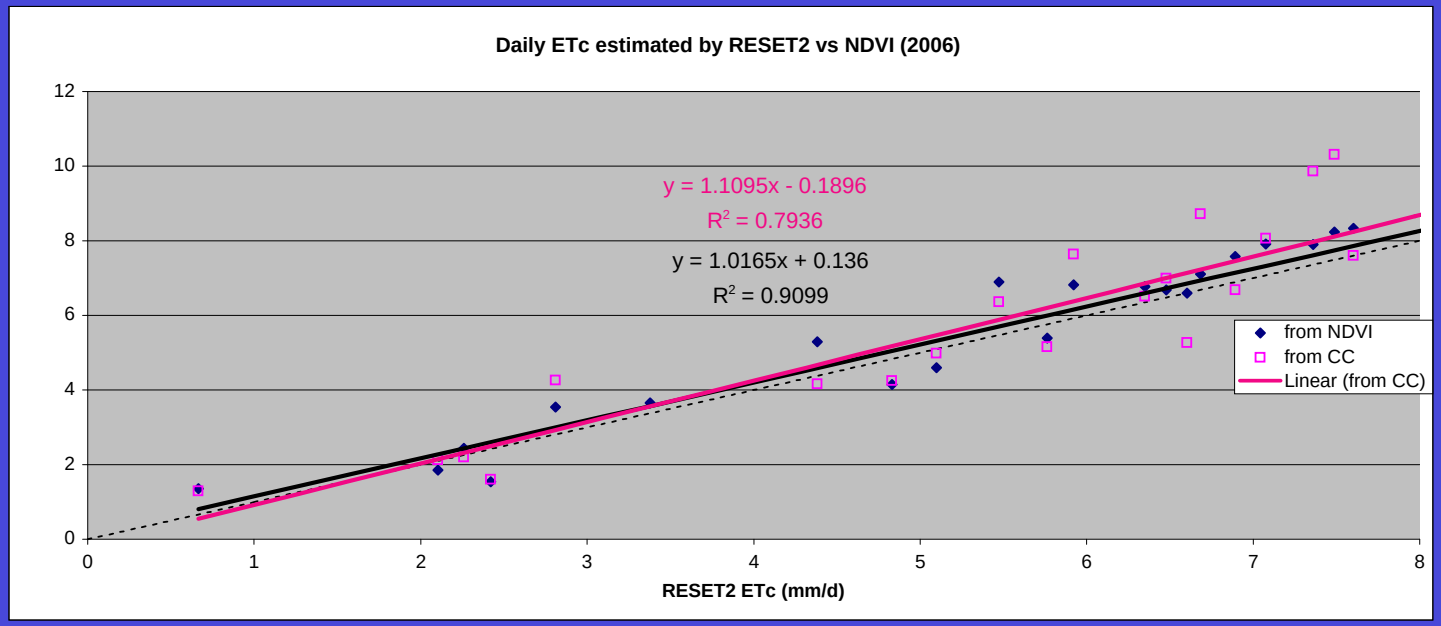
ET maps



Spatially aggregated



Comparison with energy-balance approach



Further research

- Modeling soil evap & stomatal regulation
- Temporal interpolation
- Nuts-n-bolts remote sensing issues (sun/view angle, soil background)
- Lysimeter
- Validation
- Optimal approach?
- Decision tool development