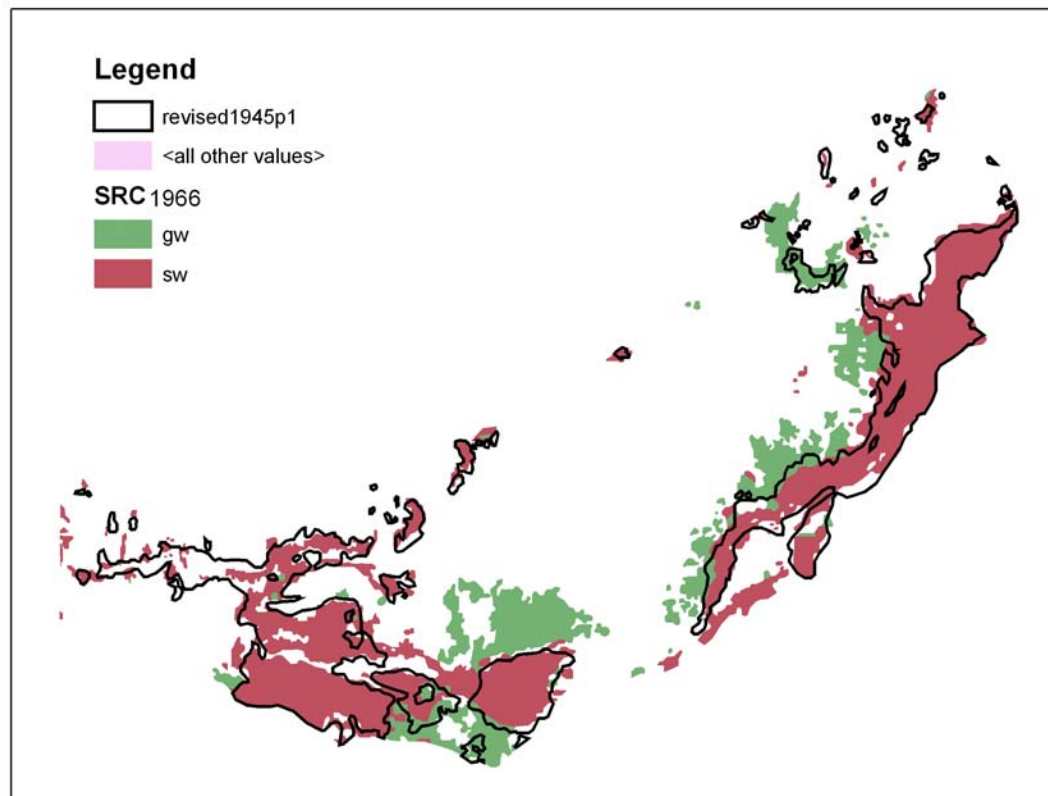


ESPAM3 Irrigated Lands Brainstorm



ESHMC meeting, 3 February 2010, B. Contor

Genesis of the idea...

- Irrigated lands map is used for two things:
 - Map diversions to model cells for calculation of net recharge from SW irrigation
 - Map acres of irrigation to model cells for calculation of ET
 - Used in net recharge from SW irrigation
 - Used in net discharge for GW irrigation
 - Used in On-Farm calculations

Genesis of the idea...

- Concerns w/ Irrigated Lands maps
 - Different data sources & methods
 - Comparable?
 - Acreage affects water budget
(acres x ET depth = ET volume)
 - *We attempted to address these with RED factors*

Genesis of the idea...

- Concerns with Traditional ET
 - How good are crop data?
 - How representative are weather-station data?
 - What about deficit irrigation (chronic & acute?)
 - What about application method?
 - What about off-target application?
 - *We attempted to address these with ET Adjustment Factors, ad-hoc corrections & On-Farm Budget method*

Genesis of the idea...

- Concerns with other consumptive use
 - Small domestic
 - Dairies
 - Wetlands
 - Industrial

Genesis of the idea...

- Concerns with complex calculations (illustration: five-step operation, with 90% chance of success at each step):

$$0.9 * 0.9 * 0.9 * 0.9 * 0.9 = 0.59$$

Now suppose we “improve” this with another step, also with 90% chance of success:

$$0.9 * 0.9 * 0.9 * 0.9 * 0.9 * 0.9 = 0.53$$

(a real statistician would say it is not that simple, but this illustrates the conceptual worry with complex methods)

Genesis of the idea...

- Serendipitous Event
 - Stacey's buffer in ET Adjustment factors calculations
 - Designed to pick up ET from off-target application of irrigation water
 - Couldn't METRIC also pick up ET from wetlands, dairies, small domestic, etc?

Genesis of the idea...

- Casual observations
 - Traditional ET on irrigated lands has been remarkably stable year-to-year
- New data & research
 - METRIC will be available for many years in our time series
 - Raftn et al journal article: NDVI-based K_c is reasonable (though inferior) proxy for METRIC (can be used when weather data are missing, cheap and easy to apply)

The Idea:

- Use traditional irrigated lands maps to define application area for SW diversions
 - Retain RED to best define application depth
- Do away with ET adjustment factors
 - Imprecision in location & effect of application methods
 - Not clear that they apply to other years
- Use METRIC directly for ET
 - Avoids concerns with crop & weather-station data
 - Captures high-definition spatial resolution of LANDSAT data

The Idea:

- Apply METRIC to buffer including all high-ET areas
 - Captures edge effects & RED imprecision
 - Captures clothesline effect from non-irrigated inclusions
 - Captures other evaporation or transpiration on surfaces visible to LANDSAT
 - Wetlands
 - Corrals, dairy lagoons & Lake Manturd
 - Lawn and garden ET from small domestic wells
 - Possibly lawn & landscape irrigation from urban & industrial areas

The Idea:

- Extrapolate or interpolate to years w/o METRIC data
 - This may be less of a distortion than the spatial smoothing of the traditional method
 - We can derive comfort from year-to-year consistency in past data
 - Use Raftn method to calculate scaling factors to capture acute effects in interpolated years
 - Even if there is only one cloud-free date we can probably make some improvement by scaling
 - We will have enough METRIC data to test this hypothesis

No decision needed today...

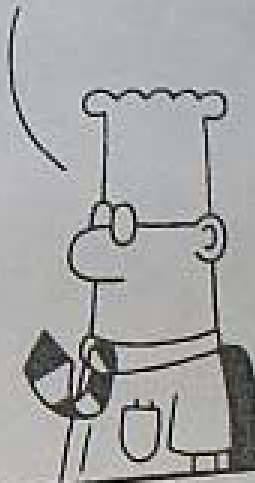
DILBERT

MAYBE SOMEONE CAN
HELP YOU QUANTIFY
THE VALUE OF YOUR
RESEARCH AND DEVEL-
OPMENT WORK.



Dilbert.com DilbertCartoonist@gmail.com

THE ONLY PEOPLE WHO
CAN QUANTIFY THE
VALUE OF RESEARCH ARE
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