Developing “Local” NASIS Interpretations

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WHY?

- 1. There is no “National” Version of an Interpretation you need
- 2. The “National” version does not seem to fit your local criteria needs

HOW?

- 1. Think about what exactly the interpretation should do……
- 2. Develop interdisciplinary team
- 3. Research how the interpretation will operate...CRITERIA and CLASS LIMITS

The HOW (continued)

- 4. Read Chapter 16 in the NASIS Getting Started Manual
- 5. Call Bob Nielsen when you get stuck

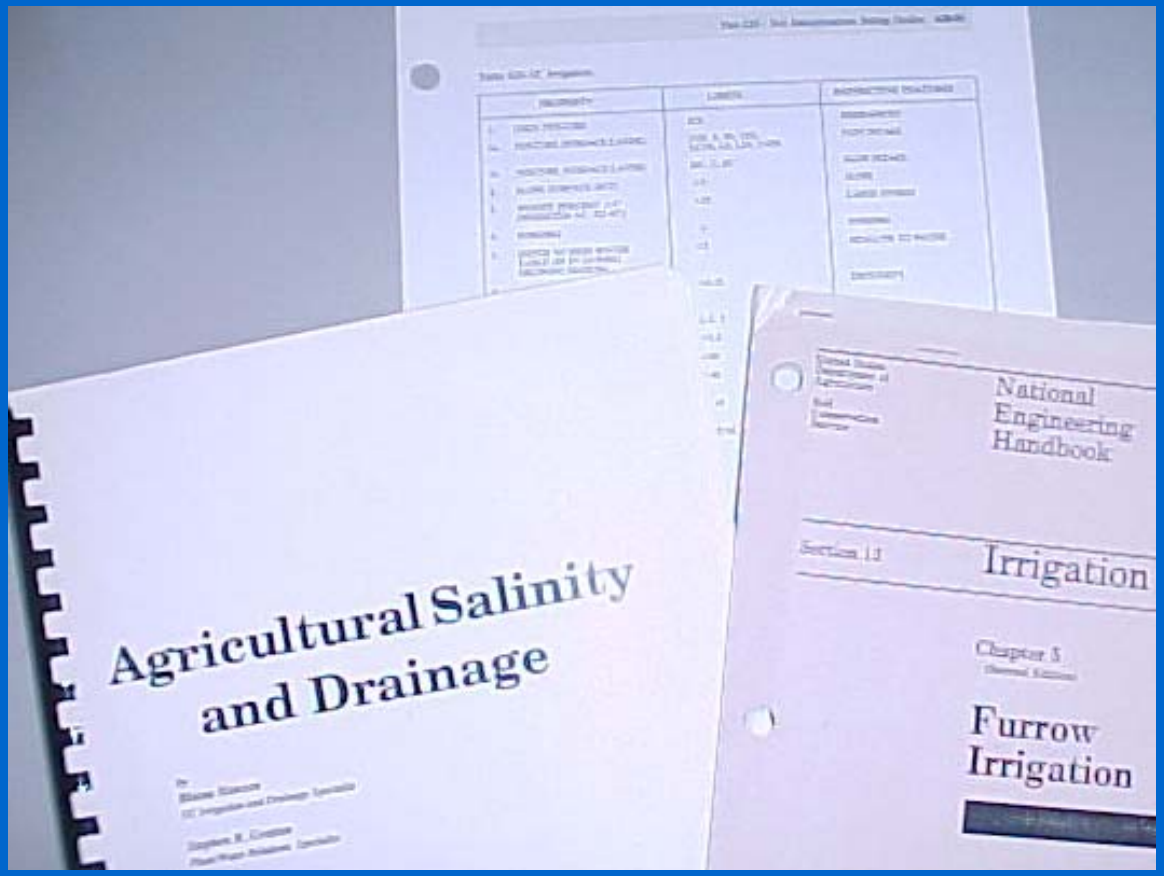
Specific Irrigation Designs

- Drip
- Sprinkler
- Graded Border
- Level Border (paddy)
- Furrow

Level Border or Paddy Irrigation

- Rice Production in the Central Valley
- Soil properties that may be “bad” for furrow systems may be perfect for Level Border (paddy) system in terms of performance, maintenance and resource conservation

Literature search



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The Level Border (paddy) Irrigation interpretation was developed by the Davis, California interpretation staff. The interpretation was developed using input from the Davis, California NRCS - Resource Technology staff (Earth Team volunteer). The interpretation received further technical review from an irrigation specialist on staff at UCDavis.

References:

California Irrigation Guide, USDA-SCS, 1982. Developed in cooperation with the Pond-Shafter-Wasco Resource Conservation District.

Hanson, Blaine and Grattan, Stephen R. 1993. Agricultural Salinity and Drainage. University of California Irrigation Program. Univ. Of California, Davis.

National Engineering Handbook, USDA-NRCS. Aug. 1996. Part 652.

National Soil Survey Handbook, 1993. United States Department of Agriculture. Natural Resources Conservation Service. Part 620 - Soil Interpretations Rating Guides 620. Table 620-32.

IMPORTANT: This draft interpretation is not designed nor intended to be used in a regulatory manner.

Line: 1 Total: 205

Apply Clear Cancel Help

File Edit Options

CRITERIA

The criteria below is stated in terms of what the 1993 NSSH restrictive features for Irrigation used to be:

Property 1 for permafrost was deleted.

Property 1a uses a crisp limit based on surface textures. The following textures are rated as a limitation: COS, S, FS, VFS, LCOS, LS, COSL, VFSL, FSL, SL and L.

Property 1b was deleted since percent clay is not a limitation.

Property 2 uses a critical slope of 2%. Any slope > 2% is a limitation.

Property 3 for coarse fragments was deleted as coarse fragment content is not a limitation.

Property 4 for ponding was deleted as ponding is not a limitation.

Property 5 was deleted in September 2002 since the soil will be wet during growing season. Property 5 rated wetness in a linear evaluation, at depth < 60 cm (2') with a value of 1 and > 90cm

Line: 51 Total: 205

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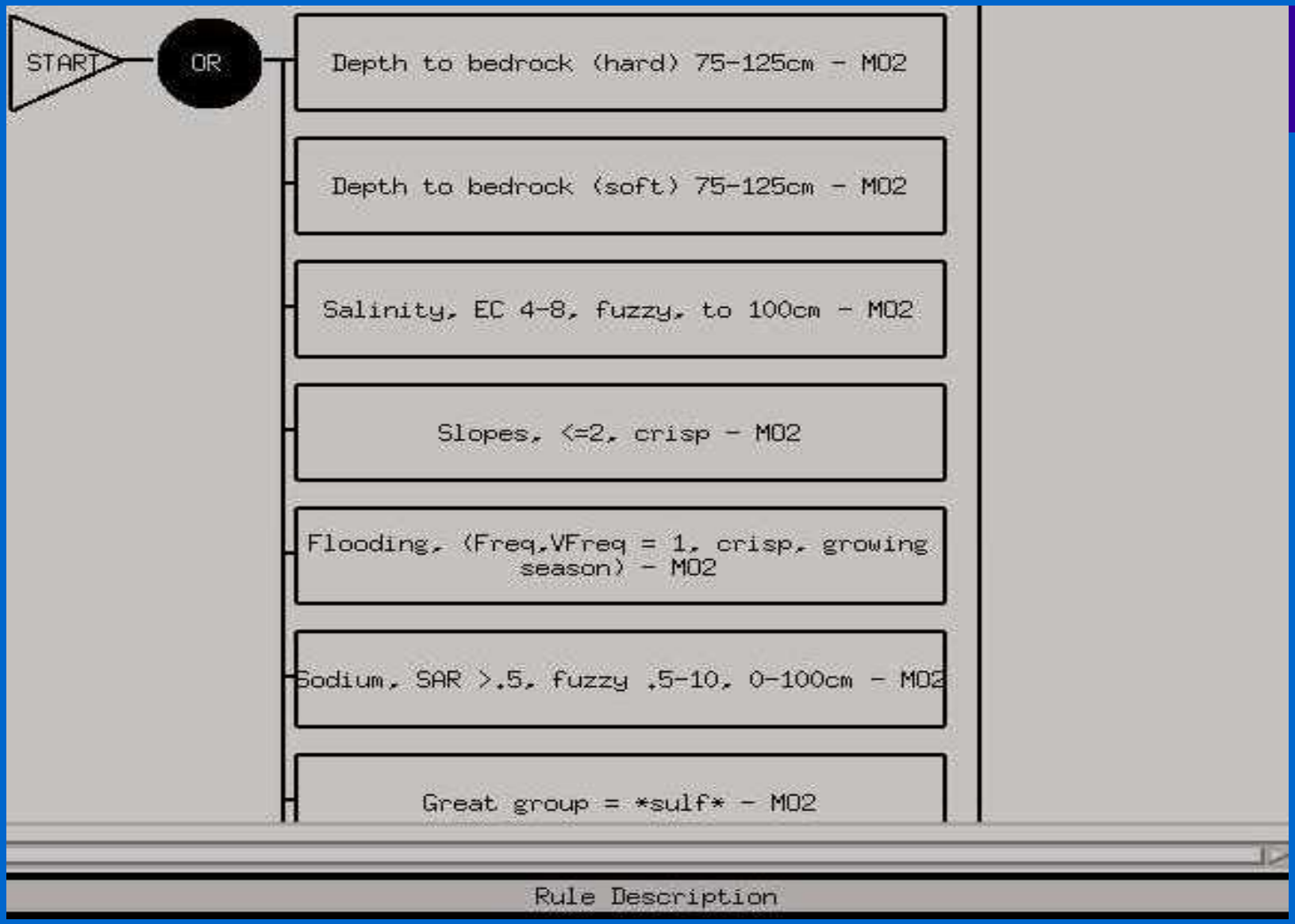

START
OR
Depth to bedrock (hard) 75-125cm - M02
Depth to bedrock (soft) 75-125cm - M02
Salinity, EC 4-8, fuzzy, to 100cm - M02
Slopes, <=2, crisp - M02
Flooding, (Freq,VFreq = 1, crisp, growing season) - M02
Sodium, SAR >.5, fuzzy .5-10, 0-100cm - M02
Great group = *sulf* - M02
Rule Description

Flooding, (Freq,VFreq = 1, crisp, growing season) - M02

Sodium, SAR >.5, fuzzy .5-10, 0-100cm - M02

Great group = *sulf* - M02

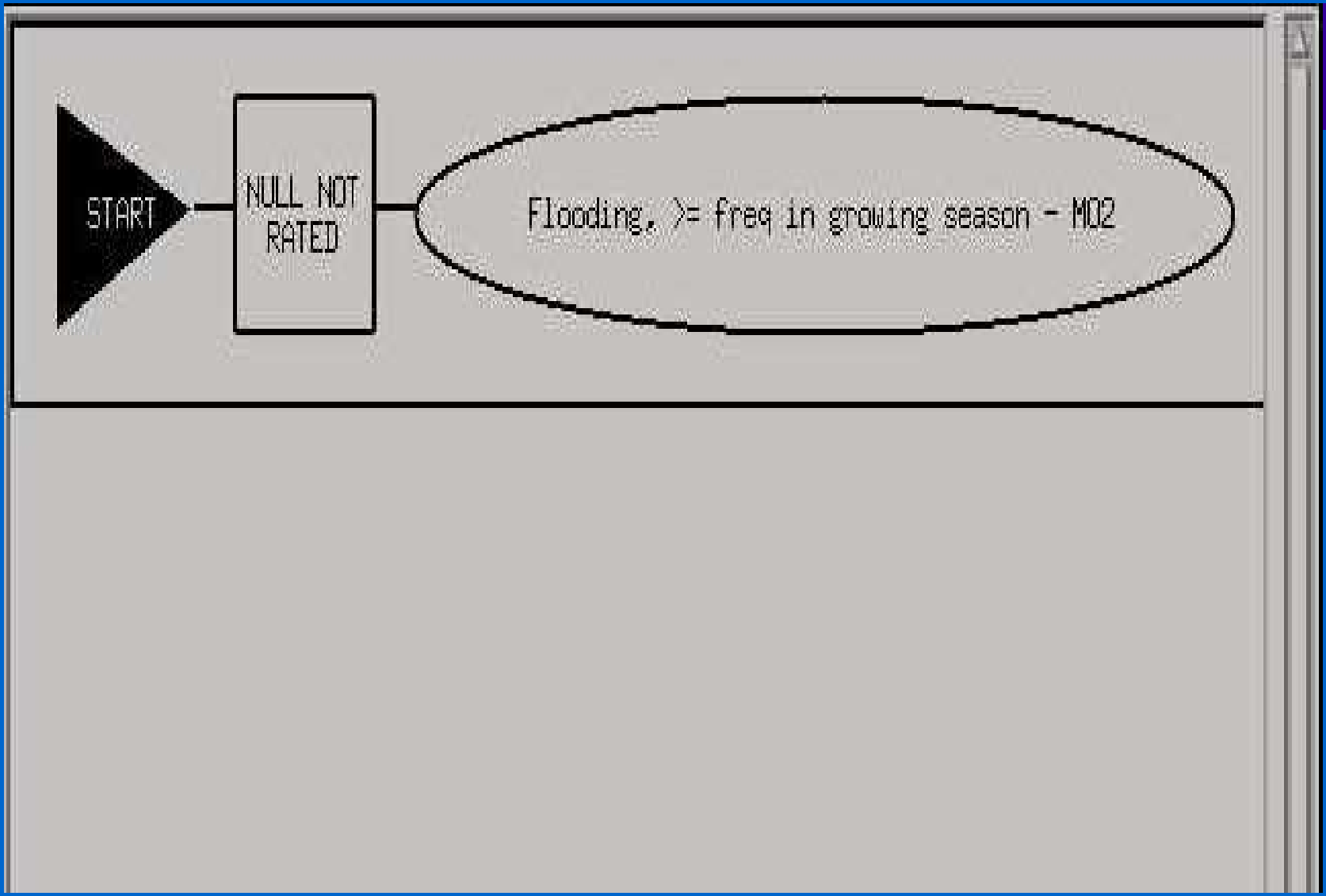
Depth to cemented pan <100cm - M02

USDA texture, surface = all sands+vfsl,fsl,sl,cosl,l - M02

AWC 4-6" in 0-100cm - M02

Perm (seepage) >=1.2"/hr 0-150cm - M02

Rule Description


START
NULL NOT RATED
Flooding, >= freq in growing season - M02

Rating Class	Rating Value
Missing flooding data	NOT RATED
Flooding >= frequent in growing season	1.0
Flooding < frequent in growing season	0

Apply Cancel Help

Rule Name

NASIS Site: MLRA02_Office | Local | National | Ready for Use Only | Primary Rules Only

WLF - Desert Tortoise - M02
WMS - Basin or Paddy Irrigation (level border) - M02
WMS - Drip or Trickle Irrigation - M02
WMS - Embankments, Dikes, and Levees - M02
WMS - Furrow Irrigation - M02
WMS - Graded Border Irrigation - M02

Selections: Add Selections | Remove Selections

"MLRA02_Office":"WMS - Basin or Paddy Irrigation (level border) - M02"

Reporting Depth 5

Print RV (Low and High)

Print Least/Most Restrictive

Print Fuzzy Rating Values

Maximum Non-Zero Reasons (0=All Reasons) 0

Name of Report test of Paddy Irrigation

Apply | Cancel | Help

Report Name: INTERP - Portrait Table

Page 1 of 1

10/03/2002

test of Paddy Irrigation
Butte Area, California: Detailed Soil Map Legend

Map symbol and soil name	WMS - Basin or Paddy Irrigation (level border) - M02
104: Bosquejo, clay--	0.000 No limitations 0.000 AWC > 6" to 40" 0.000 No sandy or loamy surface textures 0.000 SAR < 0.5 to 40" depth 0.000 No sulfuric horizons 0.000 Flooding < frequent in growing season 0.000 Permeability < 1.2"/hr 0.000 Depth to bedrock (hard) >= 40" 0.000 Bedrock (soft) >= 40" depth 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >40" 0.000 Slopes <= 2%

ALL VALUES ARE ROUNDED.

Print Save Cancel Help

Report Name: INTERP - Portrait Table

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10/03/2002

test of Paddy Irri
Colusa County, California: Deta

Map symbol and soil name	WMS - Basin or Paddy Irrigation (level border) - M02
110: Hustabel, sandy loam	1.000 Limitations 1.000 Permeability >= 1.2"/hr 0.645 SAR from 0.5 - 10 to 40" depth 0.570 AWC from 2 - 6" 0.000 No sandy or loamy surface textures 0.000 No sulfuric horizons 0.000 Flooding < frequent in growing season 0.000 Depth to bedrock (hard) >= 40" 0.000 Bedrock (soft) >= 40" depth 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >40" 0.000 Slopes <= 2%

ALL VALUES ARE ROUNDED.

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Other Irrigation Designs...

For example...Drip and Trickle

Comparison of three new Interpretations
Colusa County, California: Detailed Soil Map Legend

Map symbol and soil name	WMS - Basin or Paddy Irrigation (level border) - MO2	WMS - Drip or Trickle Irrigation - MO2	WMS - Sprinkler Irrigation - MO2
110: Hustabel, sandy loam	1.000 Limitations 1.000 Permeability >= 1.2"/hr 0.645 SAR from 0.5 - 10 to 40" depth 0.570 AWC from 2 - 6" 0.000 No sandy or loamy surface textures 0.000 No sulfuric horizons 0.000 Flooding < frequent in growing season 0.000 Depth to bedrock (hard) >= 40" 0.000 Bedrock (soft) >= 40" depth 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >40" 0.000 Slopes <= 2%	0.645 Moderate limitations 0.645 SAR from 0.5 - 10 to 40" depth 0.000 No sulfuric horizons 0.000 Permeability >=.2"/hr OR smectitic mineralogy 0.000 Not ponded 0.000 Flooding < frequent in growing season 0.000 Wetness >= 2' depth 0.000 Bedrock depth > 20" 0.000 Wetness >= 2' depth (perched) 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >= 40"	0.645 Moderate limitations 0.645 SAR from 0.5 - 10 to 40" depth 0.570 AWC from 2 - 6" 0.000 No lcos, cos, s or ls in surface 0.000 Permeability >=.2"/hr OR smectitic mineralogy 0.000 Not ponded 0.000 Flooding < frequent in growing season 0.000 If wet, wetness > 90cm during growing season 0.000 Depth to bedrock (hard) >= 40" 0.000 Bedrock (soft) >= 40" depth 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >40" 0.000 WEG > 2 0.000 Fragments (<3") <= 25% 0.000 Slopes < 6% 0.000 No sulfuric horizons 0.000 Surface clay < 60% 0.000 Surface K-factor <= .32

California Prime farmland soil

- Very deep, fine-loamy Pachic Argixeroll

Interpretation Result…

Test of new Irrigation Interpretations
Butte Area, California: Detailed Soil Map Legend

Map symbol and soil name	WMS - Drip or Trickle Irrigation - MO2	WMS - Furrow Irrigation - MO2	WMS - Sprinkler Irrigation - MO2
445: Chico, loam-----	0.000 No limitations 0.000 No sulfuric horizons 0.000 SAR < 0.5 to 40" depth 0.000 Permeability >=.2"/hr OR smectitic mineralogy 0.000 Not ponded 0.000 Flooding < frequent in growing season 0.000 Wetness >= 2' depth 0.000 Bedrock depth > 20" 0.000 Wetness >= 2' depth (perched) 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >= 40"	0.000 No limitations ** 0.000 No sandy textures in surface 0.000 SAR < 0.5 to 40" depth 0.000 Slight seepage problem 0.000 Permeability <6"/hr or #200 20-30% 0.000 Permeability <= 6"/hr above 60" 0.000 Passing #200 <20% or >30% 0.000 Permeability <6"/hr or #200 <20% 0.000 Permeability <= 6"/hr above 60" 0.000 Passing #200 >=20% 0.000 Permeability <6"/hr or #200 >30% 1.000 Passing #200 >30% 0.000 Permeability <= 6"/hr above 60" 0.000 Not ponded 0.000 Flooding < frequent in growing season 0.000 If wet, wetness > 90cm during growing season ** 0.000 Depth to bedrock (hard) >= 40"	0.000 No limitations ** 0.000 No lcos, cos, s or ls in surface 0.000 SAR < 0.5 to 40" depth 0.000 Permeability >=.2"/hr OR smectitic mineralogy 0.000 Not ponded 0.000 Flooding < frequent in growing season 0.000 If wet, wetness > 90cm during growing season ** 0.000 Depth to bedrock (hard) >= 40" 0.000 Bedrock (soft) >= 40" depth 0.000 EC < 8 mmhos/cm 0.000 Depth to pan >40" 0.000 WEG > 2 0.000 Fragments (<3") <= 25% 0.000 AWC > 6" to 40" 0.000 Slopes < 6% 0.000 No sulfuric horizons 0.000 Surface clay < 60%

MO2 Interpretation Efforts

- What we have implemented so far……

MO2 Custom Rating classes...

- Allow testing of database and interpretation by soil scientists and give users more information
- Example on next slide…….

Comparison of Rating Classes

10/08/2002

Comparison of NSSC and MO2 Rating Classes
Butte Area, California: Detailed Soil Map Legend

Map symbol and soil name	ENG - Dwellings With Basements	ENG - Dwellings With Basements - MO2
109: Bosquejo, clay loam	1.000 Very limited 1.000 Flooding 0.500 Shrink-swell 0.352 Depth to saturated zone 0.000 No permafrost depth limitation 0.000 No slope limitation 0.000 No ponding limitation 0.000 No subsidence limitation 0.000 No organic matter limitation 0.000 No bedrock depth limitation 0.000 No bedrock depth limitation 0.000 No large stone limitation 0.000 No thick cemented pan depth limitation 0.000 No thin cemented pan depth limitation	1.000 Severe 1.000 Flooding >= rare 0.500 Shrink-swell (LEP 3-6) 0.352 Wetness from 2.5' to 6' depth 0.000 Pan (thin) > 40" depth 0.000 Slopes < 8% 0.000 Not ponded 0.000 No subsidence 0.000 Bottom layer not PT, OL, OH 0.000 Bedrock (hard) > 60" depth 0.000 Bedrock (soft) > 40" depth 0.000 Fragments (>3") <25% 0.000 Pan (thick) > 60" depth

Custom interpretations for Hawaii

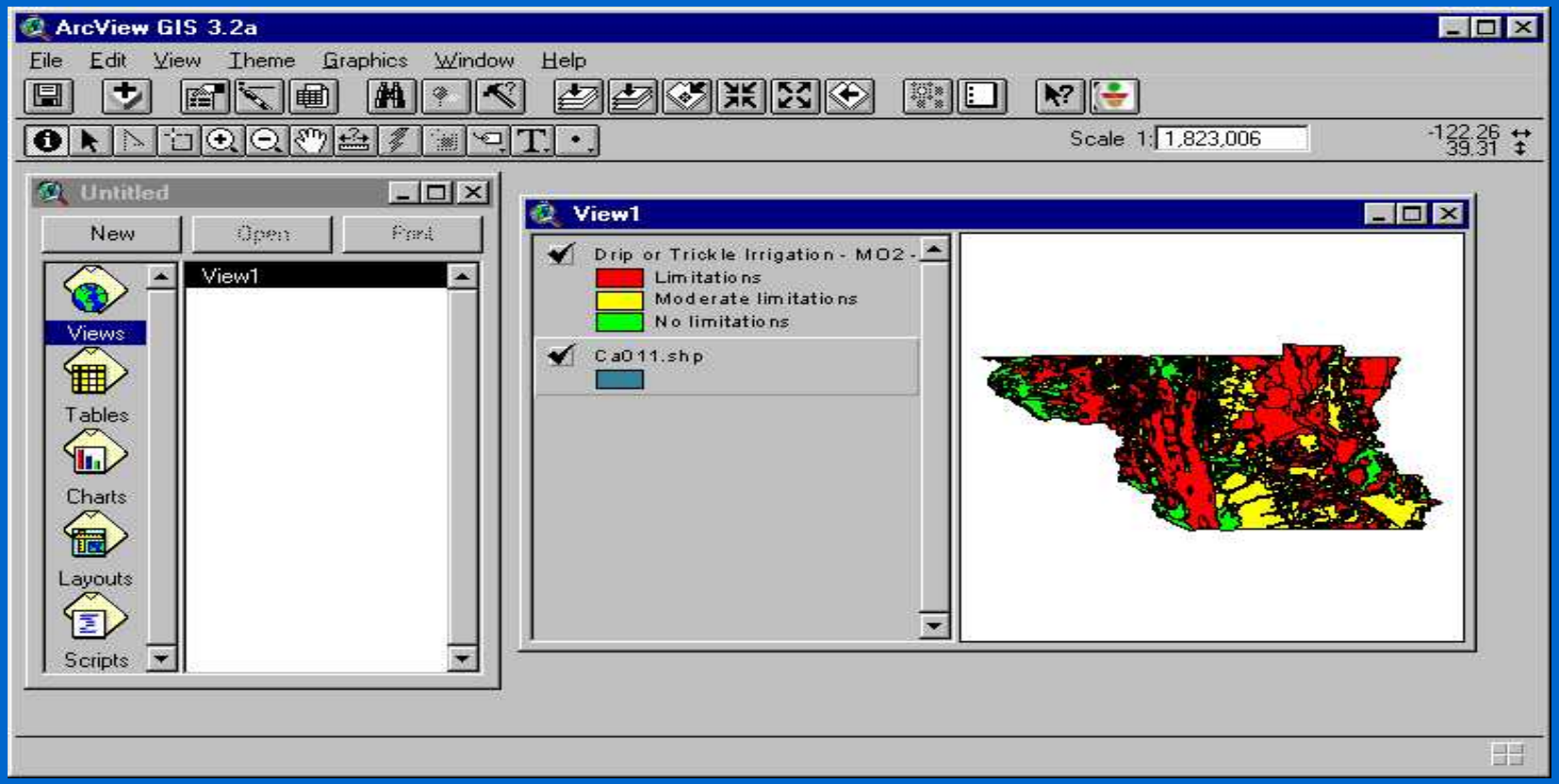
- Puddling soils, flash flooding, liquefaction, dustiness, and high lime requirement for Andisols

- Interpretations use medial, ashy, hydrous modifiers, OH-T Unified classes, in lieu of textures and soil classification

MO2 Interpretations

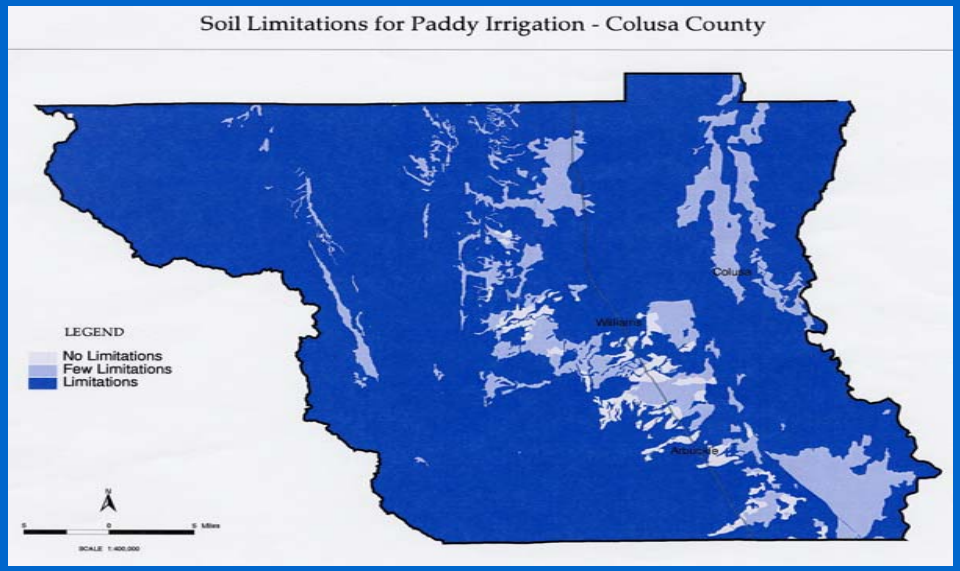
- PWM that uses the same key words as the rating classes
- Updated PWM Glossary with words and abbreviations used in rating classes

MO2 Interpretations



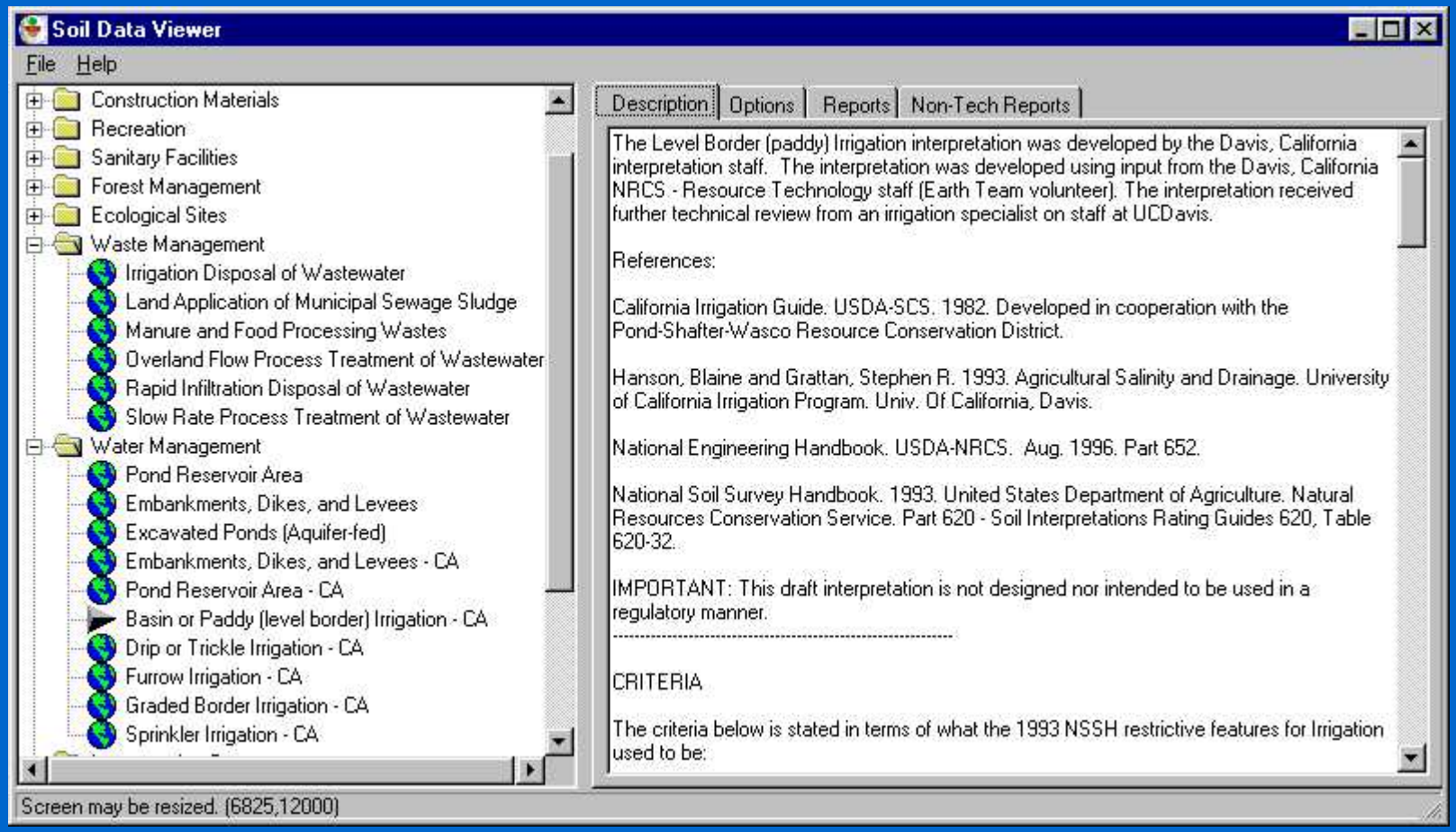
- Custom “rules file” so local interpretations can be used in SDV

MO2 Interpretations



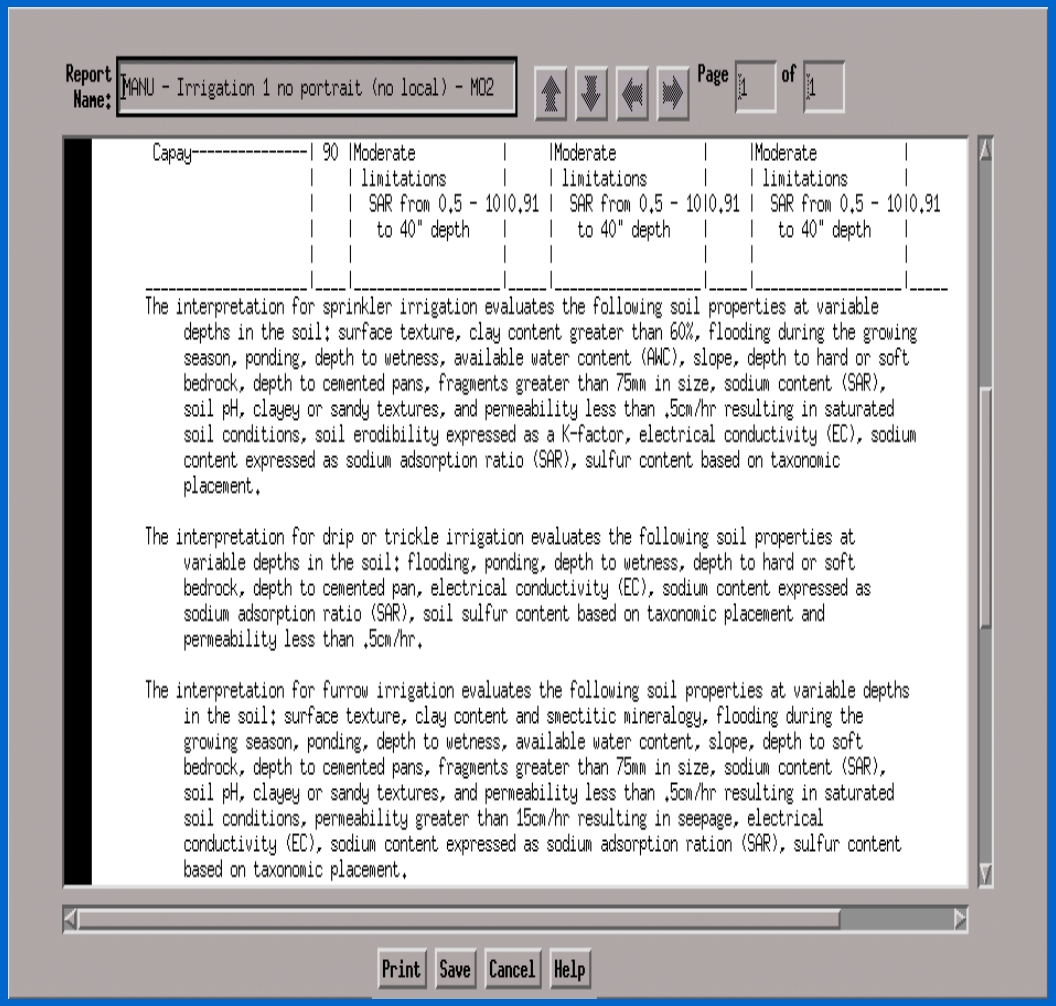
- Use maps to check criteria and rating classes
- Example: Removed wetness during growing season for paddy irrigation

MO2 Interpretations



- Rule descriptions that display criteria in the SDV

MO2 Interpretations



Report Name: MANU - Irrigation 1 no portrait (no local) - MO2

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Capay----------	90	Moderate limitations SAR from 0.5 - 10 to 40" depth	10.91	Moderate limitations SAR from 0.5 - 10 to 40" depth	10.91	Moderate limitations SAR from 0.5 - 10 to 40" depth	10.91

The interpretation for sprinkler irrigation evaluates the following soil properties at variable depths in the soil: surface texture, clay content greater than 60%, flooding during the growing season, ponding, depth to wetness, available water content (AWC), slope, depth to hard or soft bedrock, depth to cemented pans, fragments greater than 75mm in size, sodium content (SAR), soil pH, clayey or sandy textures, and permeability less than .5cm/hr resulting in saturated soil conditions, soil erodibility expressed as a K-factor, electrical conductivity (EC), sodium content expressed as sodium adsorption ratio (SAR), sulfur content based on taxonomic placement.

The interpretation for drip or trickle irrigation evaluates the following soil properties at variable depths in the soil: flooding, ponding, depth to wetness, depth to hard or soft bedrock, depth to cemented pan, electrical conductivity (EC), sodium content expressed as sodium adsorption ratio (SAR), soil sulfur content based on taxonomic placement and permeability less than .5cm/hr.

The interpretation for furrow irrigation evaluates the following soil properties at variable depths in the soil: surface texture, clay content and smectitic mineralogy, flooding during the growing season, ponding, depth to wetness, available water content, slope, depth to soft bedrock, depth to cemented pans, fragments greater than 75mm in size, sodium content (SAR), soil pH, clayey or sandy textures, and permeability less than .5cm/hr resulting in saturated soil conditions, permeability greater than 15cm/hr resulting in seepage, electrical conductivity (EC), sodium content expressed as sodium adsorption ration (SAR), sulfur content based on taxonomic placement.

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- Manuscript report footnotes with criteria summary
- Abbreviations defined

Contact Information

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