

Wading Bird Performance Measures

5/13/15

cm\_per\_ft: 30.48

Model\_area= 43350 ha

Criteria from Mark Cook - Jan 16, 2015

Water depth (ft)
<0.09 (too dry)
0.09 -- 0.44 (sub optimal dry)
0.44 -- 0.65 (optimal)
0.65 -- 1.03 (sub-optimal wet)

  

Two week recession rate (ft/wk)
0.00 (reversal)
0.05 -- 0.00 (suboptimal slow)
0.12 -- 0.05 (optimal)
0.18 -- 0.12 (suboptimal fast)
<0.18 (too fast)

Surface water depth criteria for Wading Bird suitability		
Depth (ft)	Depth (cm)	Global_Parm Description
0.09	2.7	GP_WBdepth_Dry Threshold, where it is too dry when depth<Parm
0.44	13.4	GP_WBdepth_optLow Lower depth of optimal range
0.65	19.8	GP_WBdepth_optHI Upper depth of optimal range
1.03	31.4	GP_WBdepth_Wet Threshold, where it is too wet when depth>Parm

  

2-week recession rates (calc'd as BeginDepth-EndDepth) for Wading Bird suitability		
Recc (ft/wk)	Recc (cm/wk)	Global_Parm Description
	-3	GP_Wbrecc_srev Severe reversal - gain depth (rate < Parm)
	0.0	GP_Wbrecc_rev Threshold, where it is reversal when rate<Parm
	0.05	GP_Wbrecc_optSlow Lower rate of optimal range
	0.12	GP_Wbrecc_optFast Upper rate of optimal range
	0.18	GP_Wbrecc_Fast Threshold, where it is too fast when rate>Parm

  

Other parameters needed for Wading Bird suitability		
Value	Units	Global_Parm Description
14	days	GP_WBrecc_Intvl Interval used to calculate recession rate
12	JulianMonth	GP_WBreedStart Month of breeding season start (day one of month)
6	JulianMonth	GP_WBreedEnd Month of breeding season end (day one of month)

*NOTE: for 12 and 6 for months, breeding season goes from Dec 1 through May 31 (day before June 1)*

AvgYr= 1978 DryYr= 1989 WetYr= 1994

Wbdepth[cellLoc]		New model output spatial variable for Wading Bird suitability				
Variable	Category	Description				
WBdepth	1	WBdepth_dry = sfwat < GP_WBdepth_Dry				
WBdepth	2	WBdepth_subopt_dry = sfwat ≥ GP_WBdepth_Dry && sfwat < GP_WBdepth_optLow				
WBdepth	3	WBdepth_opt = sfwat ≥ GP_WBdepth_optLow && sfwat < GP_WBdepth_optHI				
WBdepth	4	WBdepth_subopt_wet = sfwat ≥ GP_WBdepth_optHI && sfwat < GP_WBdepth_Wet				
WBdepth	5	WBdepth_wet = sfwat ≥ GP_WBdepth_Wet				

In module, daily sum cells under each WBdepth category starting at GP\_WBreedStart, ending at GP\_WBreedEnd, then divide by elapsed # days

**PM\_WB1** WBdepth categories: daily mean area (ha) within breeding season

Year	dry	subopt_dry	opt	subopt_wet	wet
1965	4335	8670	13005	6503	10838
1966	4335	10838	8670	10838	8670
1967	434	12572	19508	4335	6503
...					

**PM\_WB2** WBdepth optimum category: daily mean area (ha) within months

Year	Dec	Jan	Feb	Mar	Apr	May
1978	9537	10491	8583	12398	6676	9060
1989	5202	5722	4682	6763	3641	4942
1994	6936	7630	6242	9017	4855	6589

**PM\_WB3** Output daily maps of WBdepth (color-coded 5 categories), then for PM\_WB\_3, show Jan 15 and Apr 15 for the 3 selected years

Calculating a new recession rate every day....

**Hyd\_recc[cellLoc]** New model hydrologic spatial variable, calculates a new 2-wk recession rate every day (units=cm/wk)

a) new struct of 2D array of SURFACE\_WAT[cellLoc].array(GP\_WBrecc\_Intvl) that holds most recent GP\_WBrecc\_Intvl (14 here) number of days of depth

b) daily, calculate recession rate: Hyd\_recc[cellLoc] = (SF\_WAT[cellLoc].array(today-GP\_WBrecc\_Intvl) - SF\_WAT[cellLoc].array(today)) \* 100 / (GP\_WBrecc\_Intvl/7.0)

Note, above is simply the depth (in meters) 2 weeks (GP\_WBrecc\_Intvl) ago minus today's depth, divided by the number of weeks (2 here) (result= cm/wk)

Wbrecc[cellLoc]		New model output spatial variable for Wading Bird suitability, categorizing continuous variable Hyd_recc[cellLoc]				
Variable	Category	Description				
Wbrecc	0	Wbrecc_srev = Hyd_recc < GP_WBrecc_srev				
Wbrecc	1	Wbrecc_rev = Hyd_recc ≥ GP_WB_srev && Hyd_recc < GP_WBrecc_rev				
Wbrecc	2	Wbrecc_subopt_slow = Hyd_recc ≥ GP_WBrecc_rev && Hyd_recc < GP_WBrecc_optSlow				
Wbrecc	3	Wbrecc_opt = Hyd_recc ≥ GP_WBrecc_optSlow && Hyd_recc < GP_WBrecc_optFast				
Wbrecc	4	Wbrecc_subopt_fast = Hyd_recc ≥ GP_WBrecc_optFast && Hyd_recc < GP_WBrecc_Fast				
Wbrecc	5	Wbrecc_fast = Hyd_recc ≥ GP_WBrecc_Fast				

In module, daily sum cells under each Wbrecc category starting at GP\_WBreedStart, ending at GP\_WBreedEnd, then divide by elapsed # days

**PM\_WB4 & PM\_WB7** Wbrecc categories: daily mean area (ha) within breeding season

Year	Sreverse	reverse	subopt_slow	opt	subopt_fast	fast
1965	1200	4335	8670	13005	6503	10838
1966	1130	4335	10838	8670	10838	8670
1967	250	434	12572	19508	4335	6503
...						

**PM\_WB5** Wbrecc optimum category: daily mean area (ha) within months

Year	Dec	Jan	Feb	Mar	Apr	May
1978	9537	10491	8583	12398	6676	9060
1989	5202	5722	4682	6763	3641	4942
1994	6936	7630	6242	9017	4855	6589

**PM\_WB6** Output daily maps of Wbrecc (color-coded 6 categories), then for PM\_WB\_6, show Jan 15 and Apr 15 for the 3 selected years

**PM\_WB7** See above PM\_WB4, with additional category for severe reversal.