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MACROPHYTE MAPPING IN TEN LAKES OF SOUTH CAROLINA WITH
MULTISPECTRAL SPOT HRV DATA*

By

H. E. Mackey, Jr.

Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

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Halkard E. Mackey, Jr.
Savannah River Laboratory
Aiken, SC 29808

ABSTRACT

Fall and spring multispectral SPOT HRV data for 1987 and 1988 were used to evaluate the macrophyte distributions in ten freshwater reservoirs of South Carolina. The types of macrophyte and wetland communities present along the shoreline of the lakes varied depending on the age, water level fluctuations, water quality, and basin morphology. Seasonal satellite data were important for evaluation of the extent of persistent versus non-persistent macrophyte communities in the lakes.

SUMMARY DESCRIPTIONS OF SLIDES FOR DP-MS-88-252

- Slide 1. Title
- Slide 2. Land cover map of South Carolina showing location of lakes in blue
- Slide 3. SPOT Satellite
- Slide 4. SPOT HRV date sets available for each lake
- Slide 5. Characteristics of SPOT HRV data
- Slide 6. Typical SPOT False Color Version of HRV data for SRS for April 9, 1987
- Slide 7. Supplementary aerial photography use with each lake
- Slide 8. History (age) and use of each lake
- Slide 9. Physical characteristics of each lake
- Slide 10. Status of shoreline macrophyte development around each lake
- Slide 11. Oblique aerial view of Par Pond
- Slide 12. Small cove of Par Pond, spring 1987,
- Slide 13. Ground shot of small cove of Par Pond showing zonation along shoreline of cattails and water lillies
- Slide 14. SPOT False Color Version of HRV data for Fall 1987 of Par Pond
- Slide 15. Color coded version of land cover around Par Pond for Fall 1987 produced from SPOT HVR data
- Slide 16. Close-up of small cove area shown in slides 12 and 13 showing clustered SPOT HVR data as to land cover classes
- Slide 17. Color coded version of land cover with emphasis on aquatic macrophyte beds along shore line of small cove area in slides 12, 13, and 16
- Slide 18. Plot of SPOT HVR data for Par Pond area showing seasonal shifts in wetlands (including emphasis on macrophytes) for Spring, Summer, Fall, 1987
- Slide 19. Conclusion Slide

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SAVANNAH RIVER LABORATORY

SPOT HRV DATA

MULTISPECTRAL

Band 1	0.50	-	0.59
Band 2	0.61	-	0.68
Band 3	0.79	-	0.89

PIXEL SIZE
20 METERS

PROCESSING LEVEL
1B

SUPPLEMENTARY PHOTOGRAPHY

LAKE	BEFORE 1987	1987				1988		
		Mar	Apr	Jun	Oct	Feb	Apr	May
Par Pond	Extensive	x	x	-	x	-	x	x
Pond B	Extensive	-	x	-	x	-	x	x
L Lake	1985, 1986	-	x	-	x	x	x	x
Marion	1983 (HAP)	-	-	-	-	-	-	-
Moultrie	1983 (HAP)	-	-	-	-	-	-	-
Robinson	1981, 1983 (HAP) 1985	-	-	-	-	-	-	-
Murray	1983 (HAP), 1984 (HAP)	-	-	-	-	-	-	-
Monticello	1980, 1981 (USDA) 1984 (HAP)	-	-	x	-	-	-	-
Greenwood	1981 (HAP) 1984 (HAP)	-	-	-	-	-	-	-
Russell	-----	-	-	-	-	x	-	-

LAKE HISTORIES

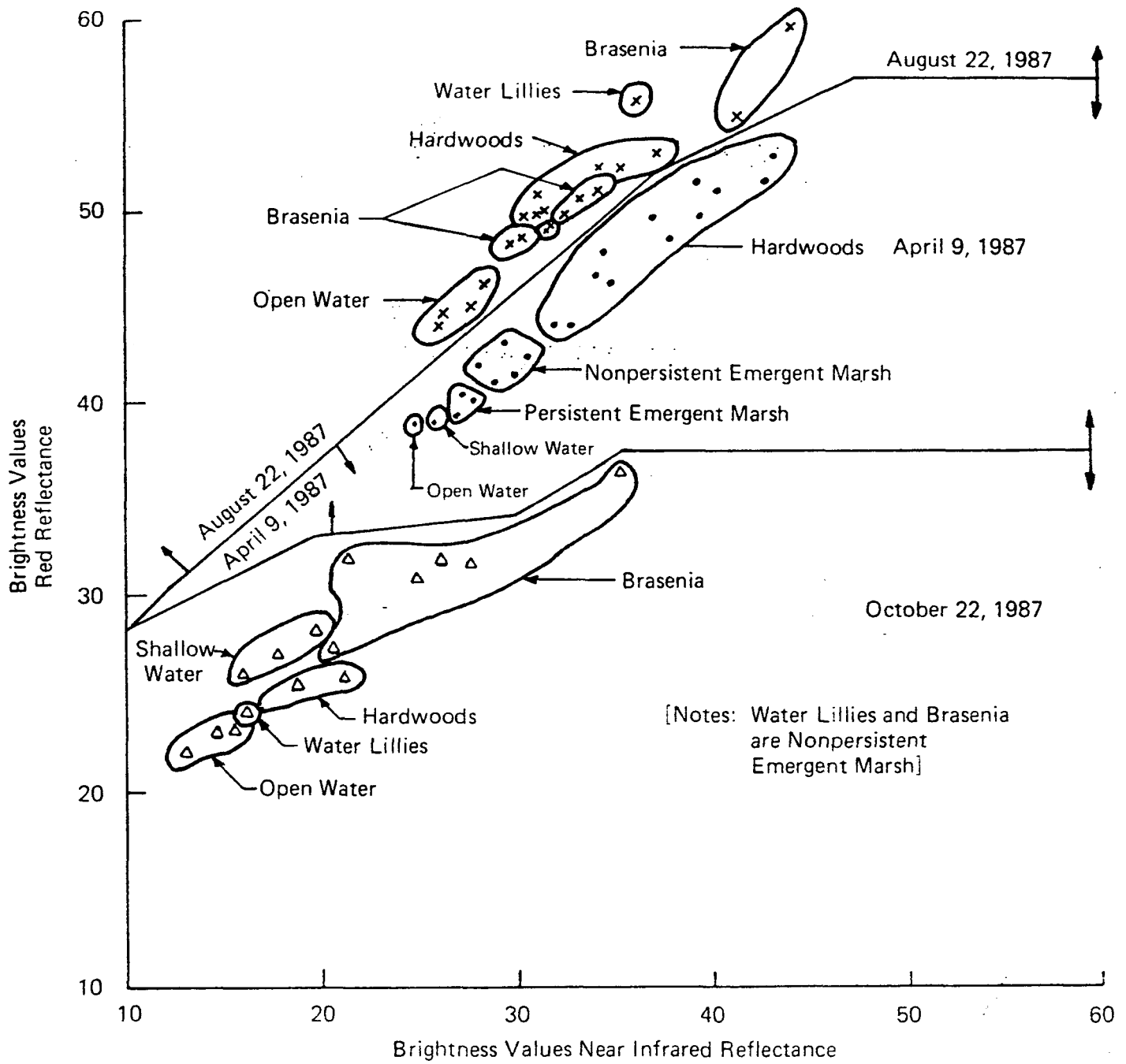
<u>LAKE</u>	<u>CONSTRUCTED</u>	<u>PURPOSE</u>
Par Pond	1958	Cooling Reservoir
Pond B	1959	Cooling Reservoir
L Lake	1985	Cooling Reservoir
Marion	1941	Multi-purpose: hydro- electric power, recreation
Moultrie	1941	Multi-purpose: hydro- electric power, recreation
Robinson	1959	Cooling reservoir for coal and nuclear power plants
Murray	1930	Multi-purpose: hydro- electric power, recreation, drinking water
Monticello	1978	Cooling reservoir, pump storage
Greenwood	1940	Hydroelectric power
Russell	1984	Multipurpose: hydro- electric power, recreation, drinking water, flood control

PHYSICAL CHARACTERISTICS OF REGIONAL RESERVOIRS

Reservoir	Physiographic Province	Maximum Depth (m)	Mean Depth (m)	Surface Area (sq km)	Volume x 10**8 cu m	Residence Time (days)	Shoreline Length (km)	Drainage Area x 10**3sq km	Shoreline Development Ratio
Par Pond	Coastal Plain	18	6.2	10.12	0.62	108.8	53	0.093	4.7
Pond B	Coastal Plain	12	4.2	0.81	0.034	- - -	6.4	- - -	2
L-Lake	Coastal Plain	19.8	8	4.2	0.31	14 - 33	2.1	- - -	0.3
Marion	Coastal Plain	23.4	3.9	447.6	15.48	31 - 51	529.6	25.43	7.06
Moultrie	Coastal Plain	23	5.7	263	13.13	34 - 62	160.9	38.21	2.9
Robinson	Coastal Plain	9.4	4.2	9.11	0.38	37 - 131	- -	0.45	- -
Murray	Piedmont	57.8	12.6	205.6	26.08	357	844	5.86	17.7
Monticello	Piedmont	38.4	17.9	39.6	4.93	- - -	- -	0.044	- -
Greenwood	Piedmont	21	7	46.1	3.2	82	341	2	- -
Russell	Piedmont	47	12	107.9	12.71	102	885	2.1	24.5

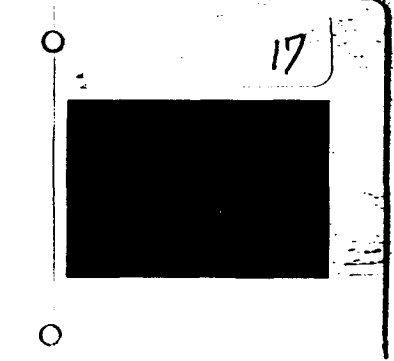
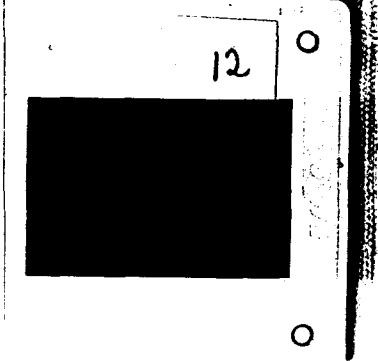
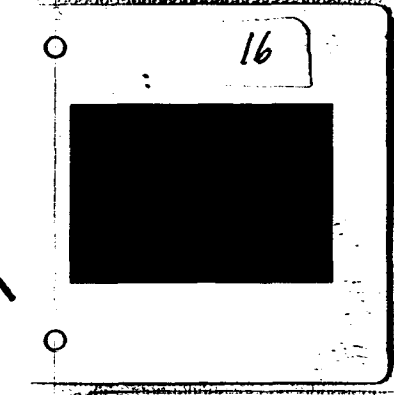
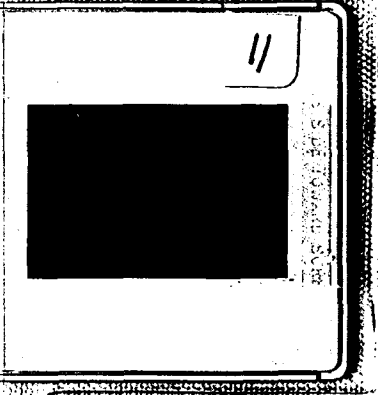
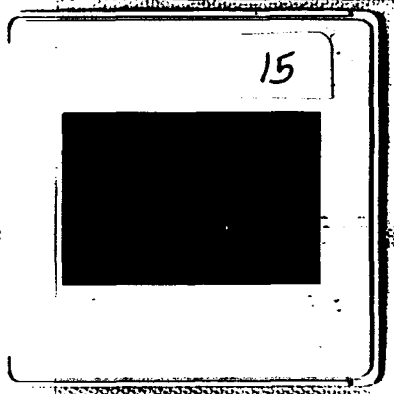
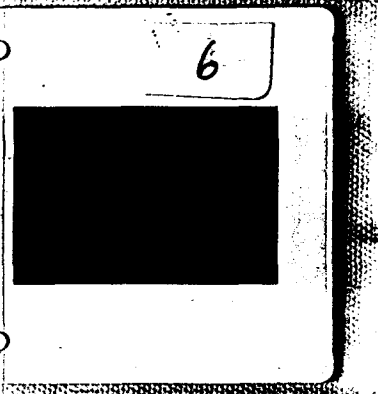
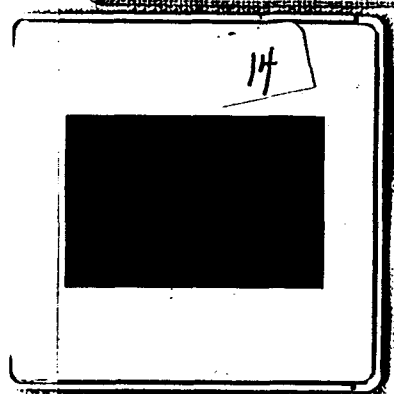
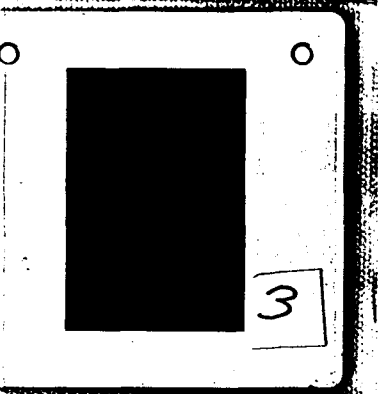
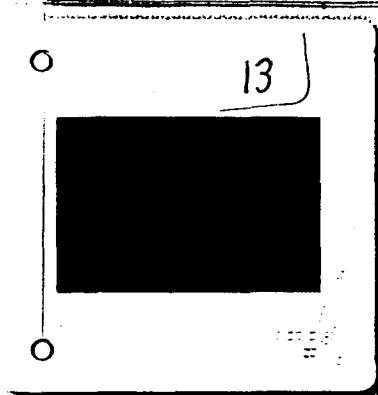
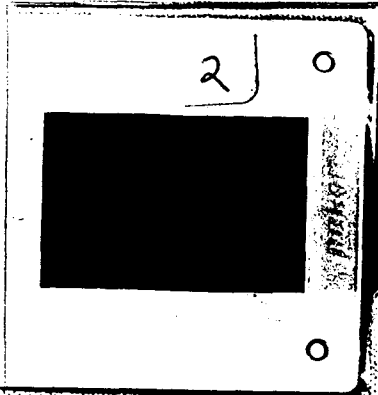
EMERGENT MACROPHYTES

LAKE	STATUS OF EMERGENT MACROPHYTE DEVELOPMENT	AGE OF LAKE (YEARS)	WATER LEVEL VARIATION (METERS)
Par Pond	Extensive	31	<0.3 annually
Pond B	Extensive	30	<0.3 annually
L Lake	Initial Establishment	4	<0.3 annually
Marion	Extensive	48	~0.3 annually
Moultrie	Extensive	48	~0.3 annually
Robinson	Moderate	30	<0.3 annually
Murray	Limited	58	1.5 - 3.0 annually
Monticello	Limited	11	0.6 - 0.9 daily
Greenwood	Limited	49	1.0 - 2.0 annually
Russell	Limited	5	0.9 - 1.2 annually



CONCLUSION

SPOT HVR DATA PROVIDE A POTENTIALLY USEFUL
MEANS TO MONITOR EMERGENT MACROPHYTES IN
LARGE SOUTHEASTERN LAKES



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