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Colored Dissolved Organic Matter (CDOM) Workshop summary

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COLORED DISSOLVED ORGANIC MATTER (CDOM)

WORKSHOP SUMMARY

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Hosted by the
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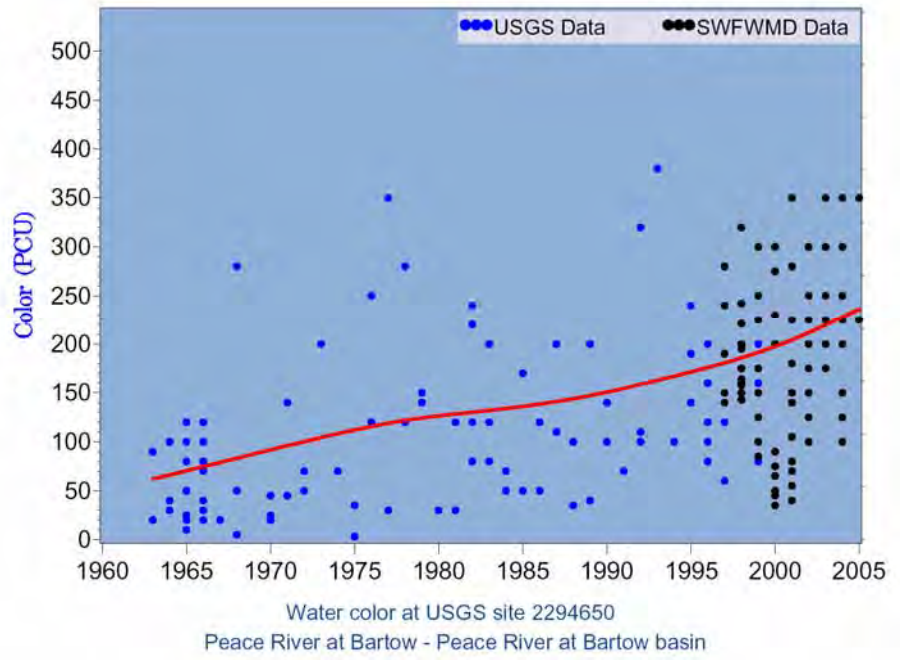
CHANGES IN LAND USE IN THE PEACE RIVER WATERSHED AND CDOM IN THE LOWER PEACE RIVER WATERSHED AND UPPER CHARLOTTE HARBOR

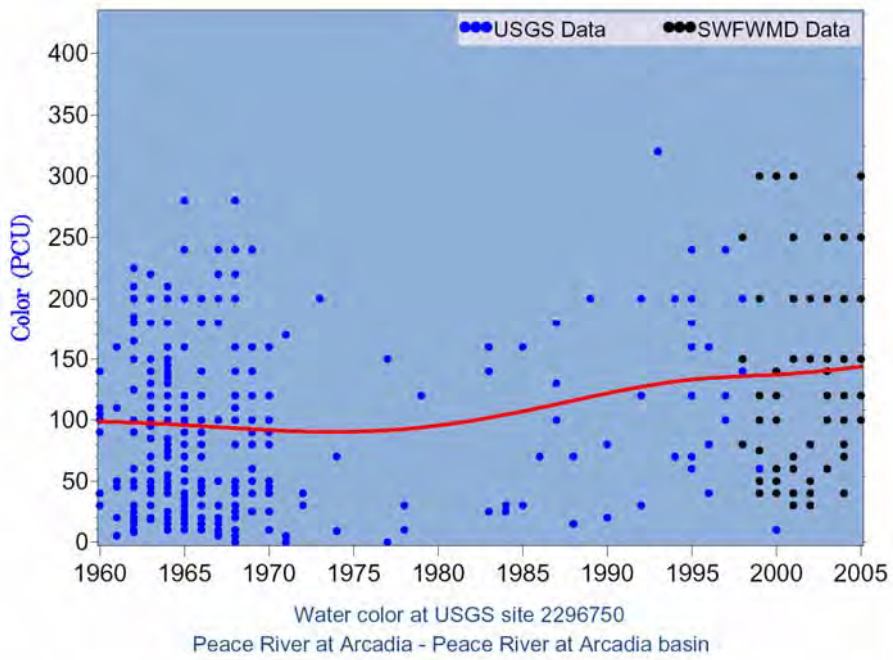
Ralph Montgomery, PBS&J and Sam Stone, PRMRWSA

By the 1940s, only 15% of the Peace River watershed had been developed or cleared: 60% was native uplands; 25% wetlands. By 1979, half of the native uplands had been cleared at a rate of 14 square miles (land sections) per year, and wetlands went from covering 25% of the watershed to 18%. By 1999, native uplands were reduced to 17% from 30%, and additional wetlands were also lost. Agriculture was the main developed landuse in the 1940s; mining and urban were still quite small. By 1979, however, cleared agricultural land was 40% of the watershed and mining and urban represented 5% of the landuse each. Cleared agricultural land comprised 44% of the watershed in 1999 with urban and mining representing about 10% of the watershed each. Thus, there have been major land use changes in the Peace River Watershed, and the largest of these changes pre-date most available water quality data (e.g., color).



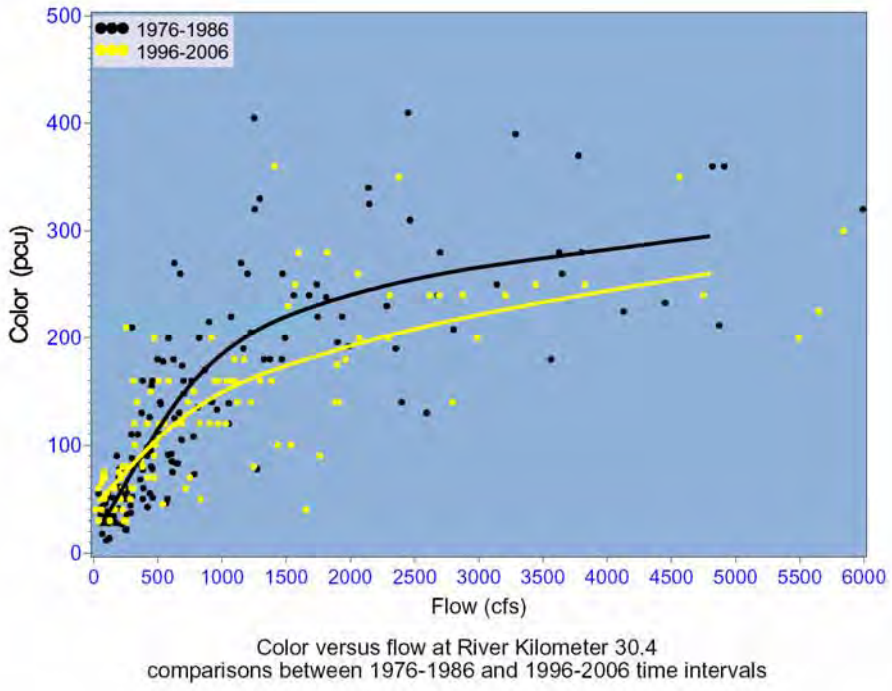
(provided by R. Montgomery and S. Stone)

Color appears to be increasing in the upper Peace River basin since the mid 1960s (see above graph). Color also appears to be increasing at the lower Peace River monitoring station since the 1960s (see graph below).

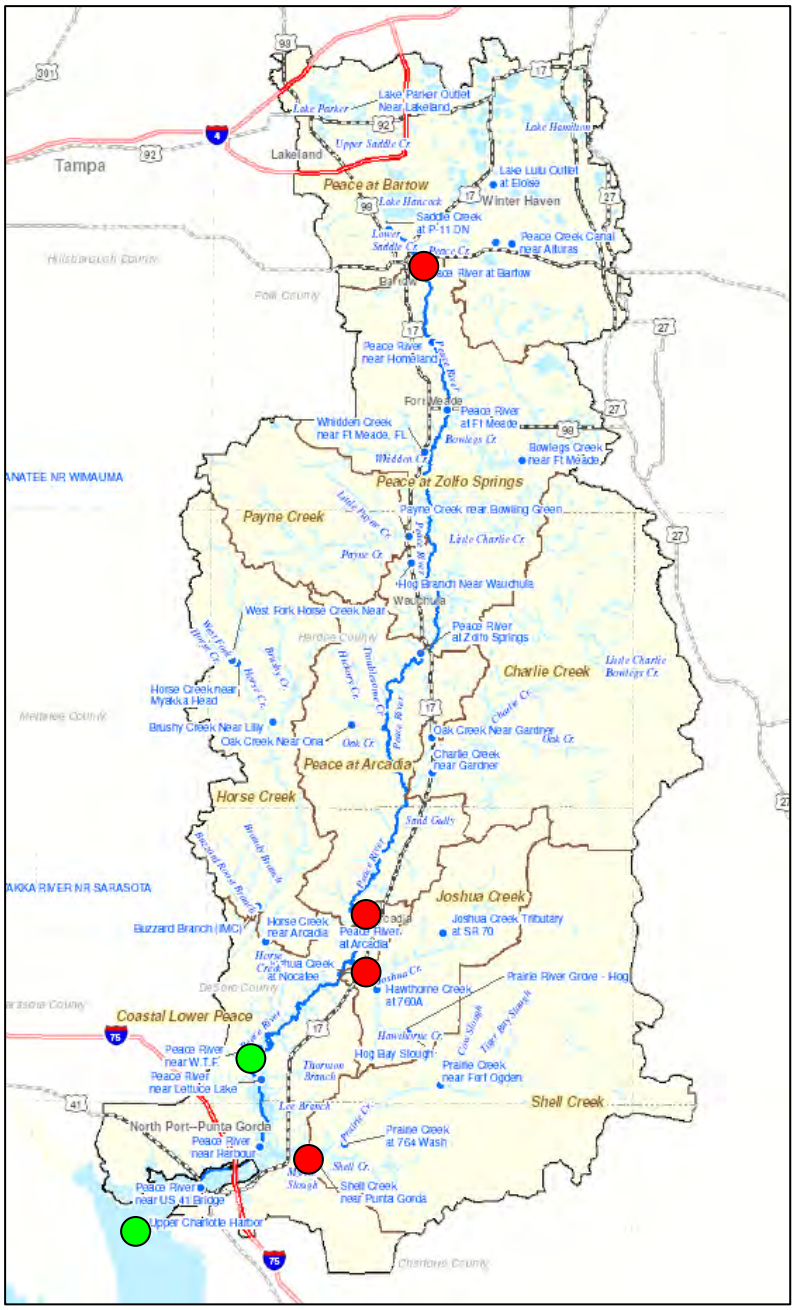


(provided by R. Montgomery and S. Stone)

These changes in color concentrations are associated with changes in flow conditions and are not a result of landuse change.



(provided by R. Montgomery and S. Stone)



(provided by R. Montgomery and S. Stone)

Water Quality Stations in the Peace River:

- Peace River at Bartow
- Peace River at Arcadia
- Joshua Creek at Nocatee
- Shell Creek near Punta Gorda
- Lower Peace River
- Upper Charlotte Harbor

Apparent increases in color in the upper and middle watershed are associated with declines in groundwater discharges by mining and local springs. Apparent recent increases in color in the lower river and upper Charlotte Harbor estuary correspond with increases in wet-season flow.

The following table lists average and median seasonal flow in the tidal Peace River and water color at 2 stations in the Peace estuary for different time periods.

Period	Season	Flow in cfs (Peace River at Arcadia + Horse & Joshua Creeks)		Water Color (pcu) at River Kilometer -2.4		Water Color (pcu) at River Kilometer 30.4	
		Median	Mean	Median	Mean	Median	Mean
1976-1986	Nov-Feb	363	689	28	26	87	106
	Mar-May	260	708	23	36	74	98
	Jun-Oct	643	1426	40	62	180	186
1996-2006	Nov-Feb	406	1220	28	42	90	111
	Mar-May	213	776	25	32	70	91
	Jun-Oct	1111	2369	60	88	200	207

(provided by R. Montgomery and S. Stone)

However, long-term changes in water quality characteristics such as orthophosphate and silica levels may be related to recent changes in landuse.

FLOW, SOURCE AND CDOM IN THE CALOOSAHATCHEE RIVER AND ESTUARY

Peter Doering, South Florida Water Management District

The Caloosahatchee Estuary is located on the southwest coast of Florida. The estuary extends from the Franklin Lock (S-79) to Shell Point where it empties into San Carlos Bay. The Caloosahatchee River, which runs from Lake Okeechobee to the Franklin Lock, is the major source of freshwater to the estuary. The Caloosahatchee River itself has two sources major sources of water: the Caloosahatchee River Watershed and Lake Okeechobee. On average, about half comes from the Lake and about half from the watershed. The short term variability is quite large, so that on a month-to-month basis the % derived from either source can vary from 0 to 100%.

CDOM can dominate the appearance of this system. The data herein measures CDOM as Color. This presentation includes data from just two areas of the estuary. The first is S-79, where we have a continuous bimonthly sampling that has been going on since 1982. And this has been augmented by sampling from a couple of other programs. The second is the mid estuarine region, which has been sampled discontinuously since 1985. The sampling has occurred in three time periods: 1985-89, 1994-1996, 1999-present. Also sampling has occurred at two different stations, these are about 300 yards apart.

Lastly, when we consider mixing behavior, we will be looking at data from all these stations pictured here. These were sampled 24 times during 2000, 2001 and 2003 by Harvey Harper from Environmental Research and Design, Inc.