An Assessment of Seagrass and Tidal Flat Recovery from Anthropogenic Physical Disturbance Events Along the Padre Island National Seashore

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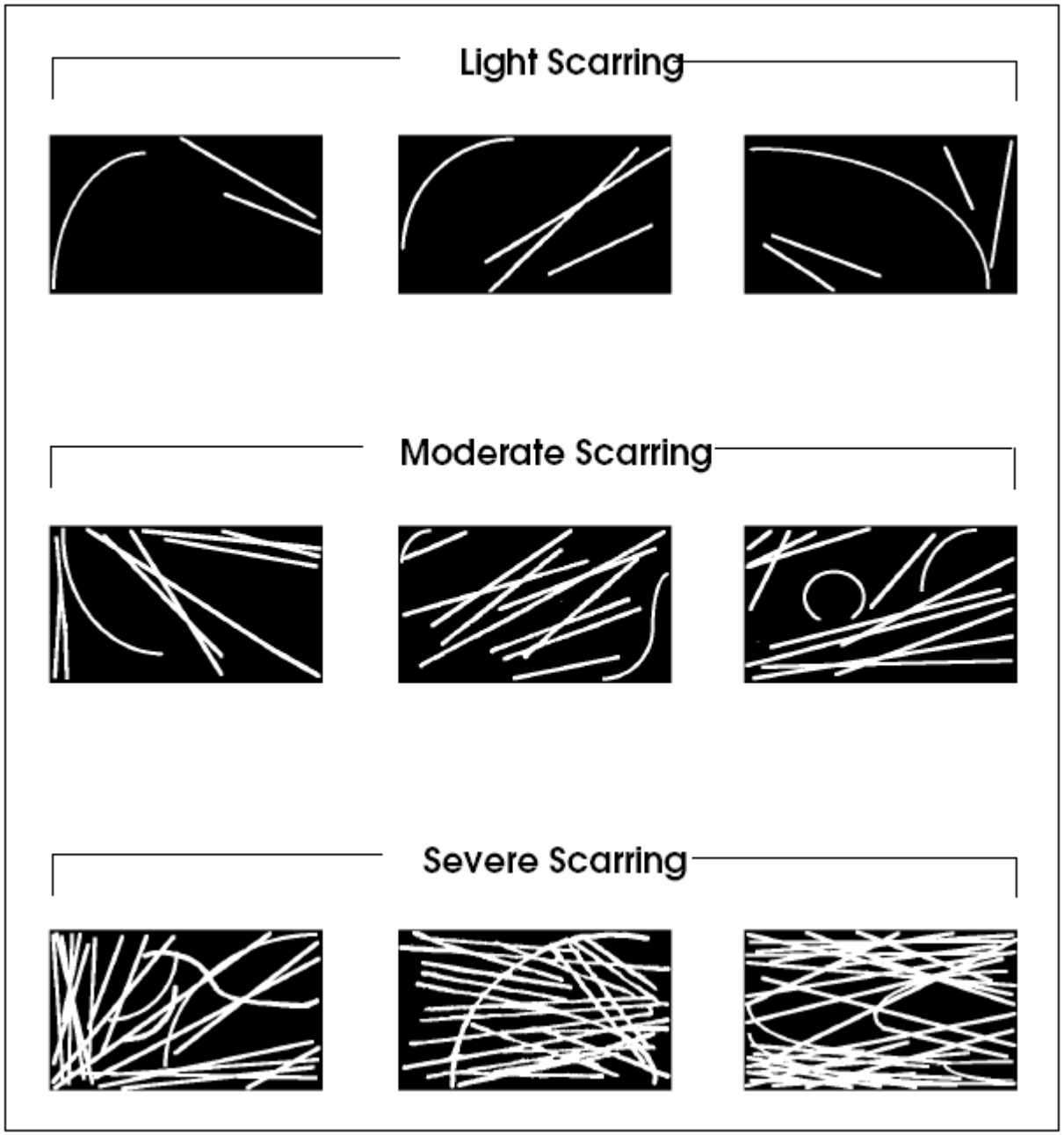


Sargent et al. 1995

Previous Studies

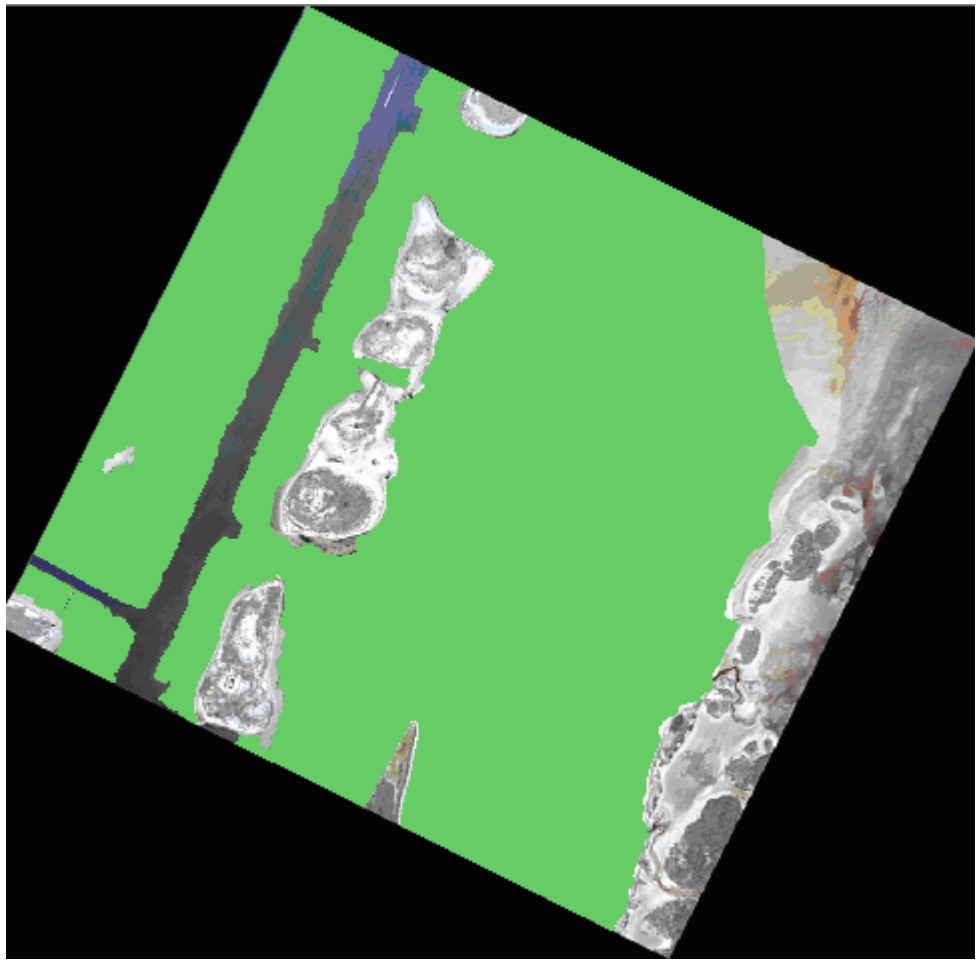
- Sargent et al. 1995
  - Overall scarring = 6.5%
  - Light = 4.1%
  - Moderate = 1.8%
  - Severe = 0.6%
- Dunton and Schonberg 2002
  - Overall scarring = 36.8%
  - Light = 3.4%
  - Moderate = 16.1%
  - Severe = 17.3%

Project Questions

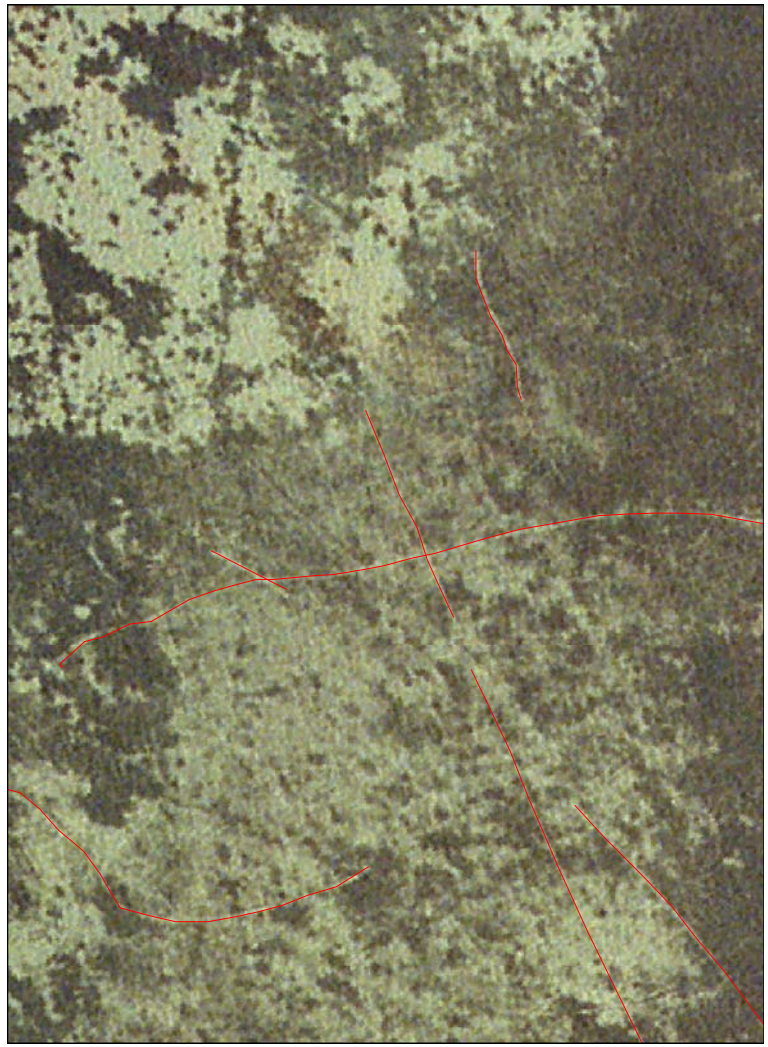
1. How variable is scarring intensity along the Padre Island National Seashore?
2. How has scarring intensity changed between 2002 and 2005?
3. What is the average recovery time for propeller scars?
4. How long have ORV tracks persisted in the tidal flats?
5. How does intensity and recovery of scarring in the Padre Island National Seashore compare to scarring in other regions?

Aerial photographs in the Padre Island National Seashore chosen for analysis

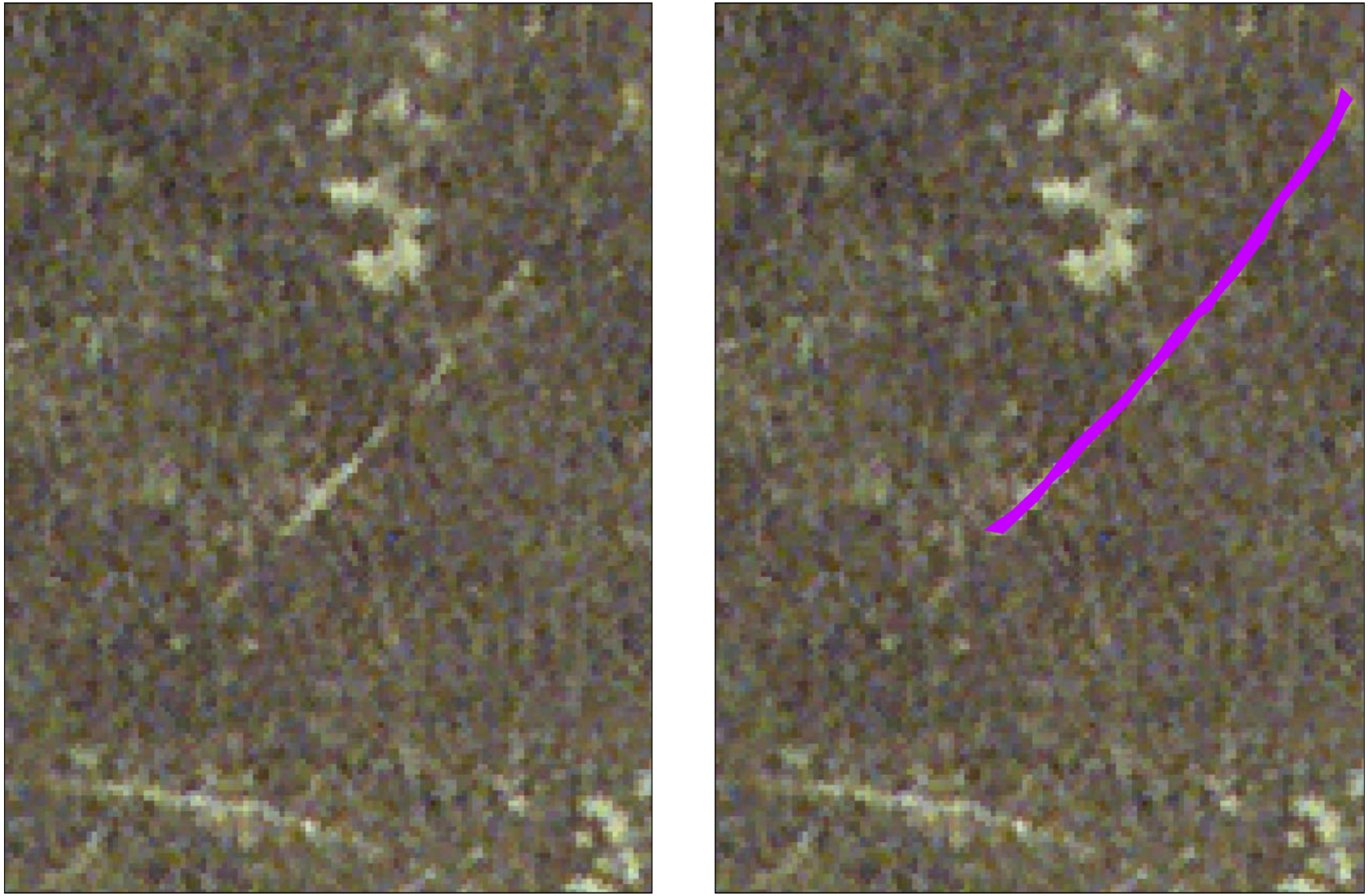
Photo Number	Approximate Center Latitude	Approximate Center Longitude	Geographic Description
1	27:31.844N	97:17.221W	North Bird Island, a few propeller scars
2	27:30.876N	97:17.720W	North Bird Island, a lot of propeller scarring
3	27:28.086N	97:19.182W	Boat ramp and area heavily used by windsurfers, a lot of propeller scarring
4	27:16.214N	97:23.129W	A lot of ORV tracks
5	27:15.163N	97:23.386W	A lot of ORV tracks and a few propeller scars
6	27:05.605N	97:23.804W	A few ORV tracks, with some extending into seagrass beds



ORV tracks in
seagrass beds

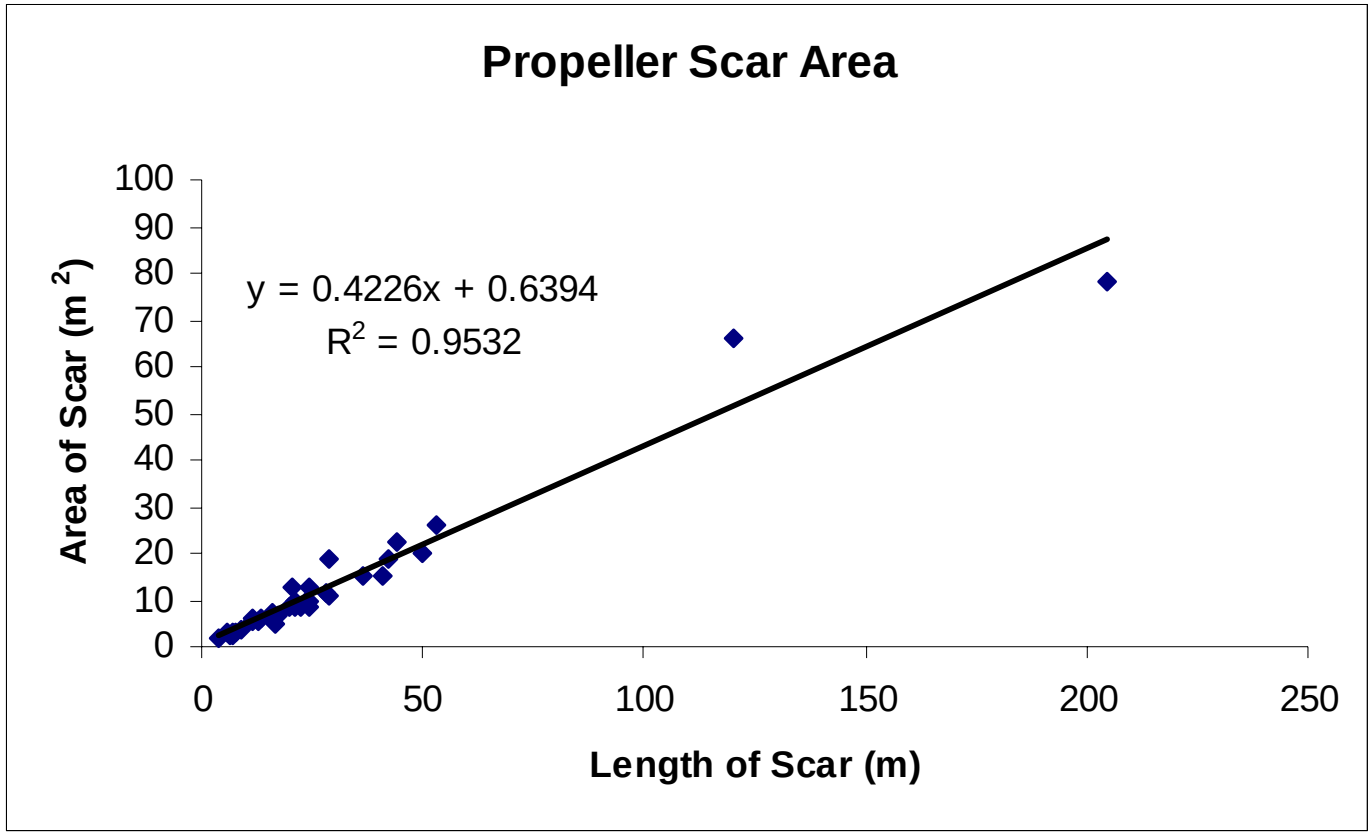


Length measurements
(43X)



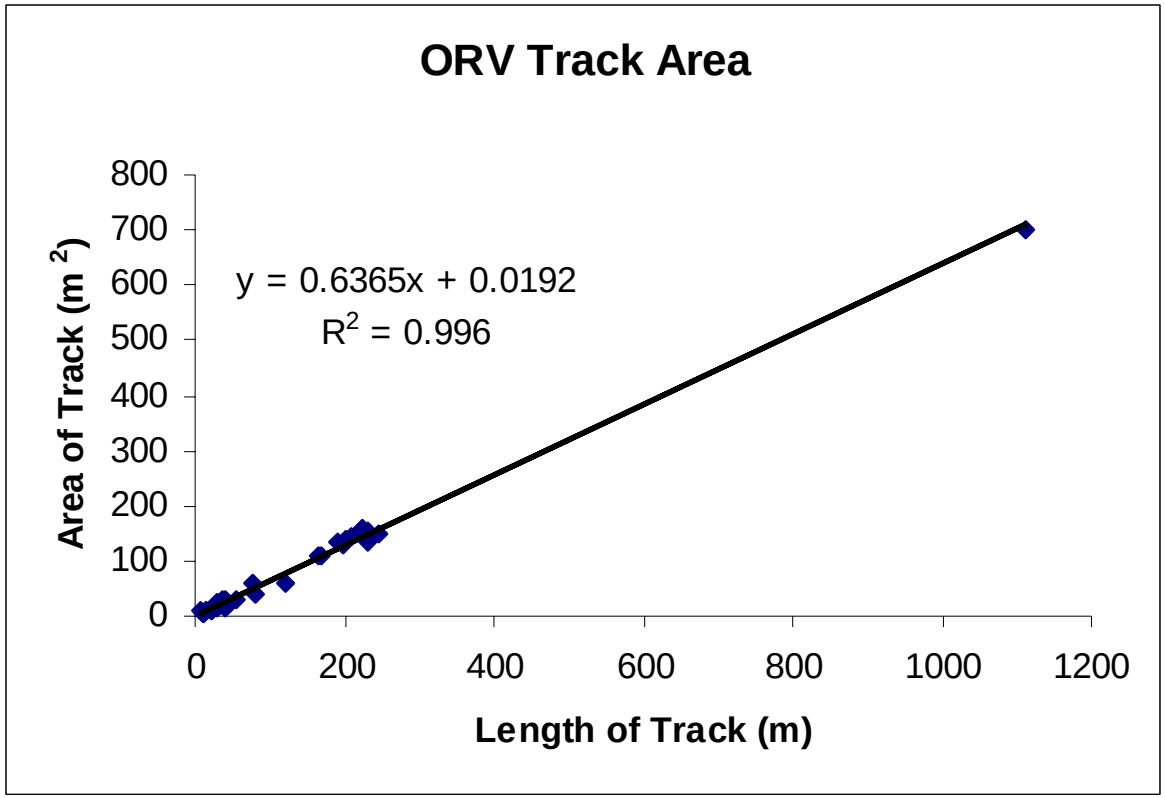
Area measured
(144X)

Propeller scar area in relation to propeller scar length (n = 34) based on analysis of six surveyed areas in the Padre Island National Seashore.



Width = 46 centimeters

ORV track area in relation to ORV track length (n = 34) based on analysis of six surveyed areas in the Padre Island National Seashore.



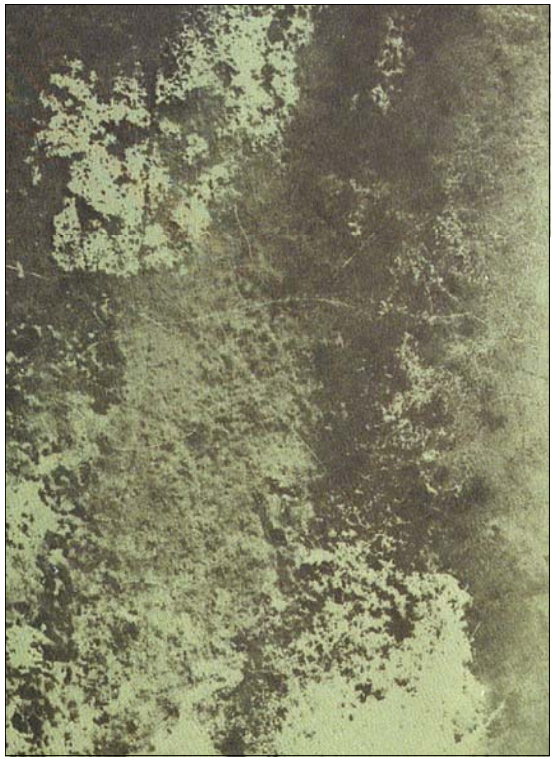
Width = 64 centimeters

Overview of propeller scarring in all of the six surveyed areas

	2002	2005
Total # of Propeller Scars	1,179	1,012
Total Length of Scars (km)	34.02	28.90
Total Area of Scars (hectares)	1.51	1.29
Total Area of Seagrass (hectares)	1,480.20	1,502.92
Minimum Length of Scars (m)	2.65	1.89
Maximum Length of Scars (m)	812.30	381.76
Average Width of Scars (m/pixels)	.465/2.4	.478/2.5
Average Length of Scars (m)	44.39	26.86
Average Area of Scars (m^2)	18.87	10.56

Overview of ORV track scarring in all six surveyed areas

	2002	**2005**
Total # of ORV Tracks	1,593	2,023
Total Length of Tracks (km)	258.53	303.44
Total Area of Tracks (hectares)	16.46	19.32
Total Area of Wind-Tidal Flats (hectares)	552.51	529.06
Minimum Length of Tracks (m)	4.74	2.55
Maximum Length of Tracks (m)	1,607.65	1,604.93
Average Width of Tracks (m/pixels)	.6370/3.3	.6370/3.3
Average Length of Tracks (m)	118.54	106.65
Average Area of Tracks (m^2)	75.47	67.92



Light
Polygon

(<1%)

Moderate
Polygon

(8%)

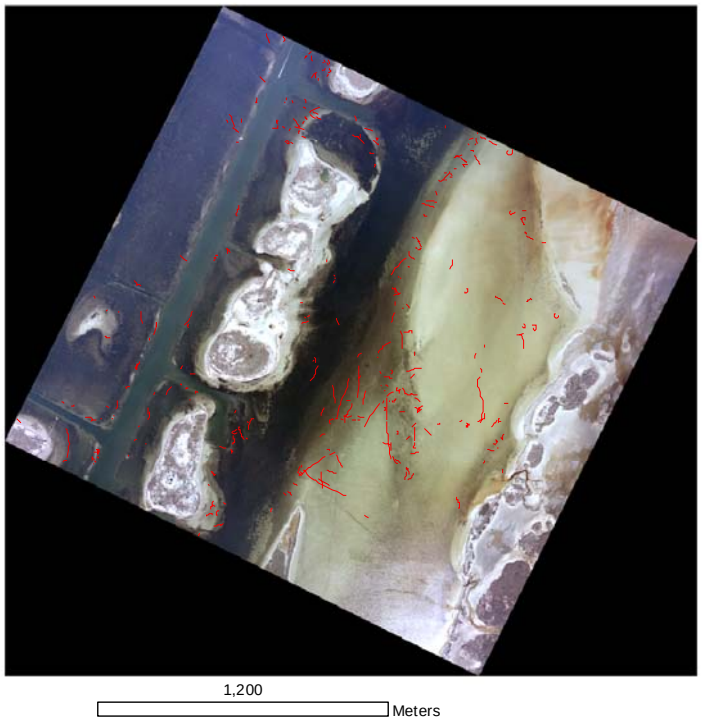
Severe
Polygon

(30%)

Photo # 1

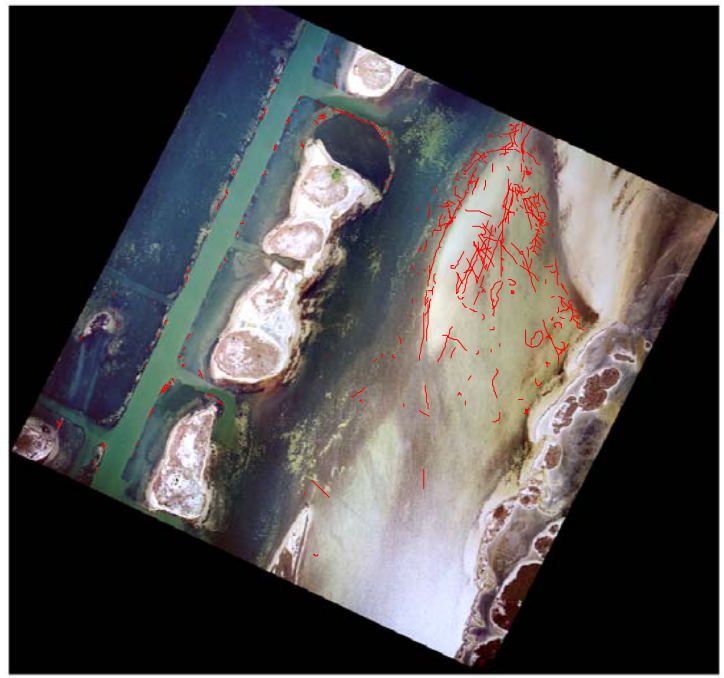
4.92%
Scarred

2002



11.76 %
Scarred

2005



15.22 hectares scarred

22.4 % relative scarring

LIGHT

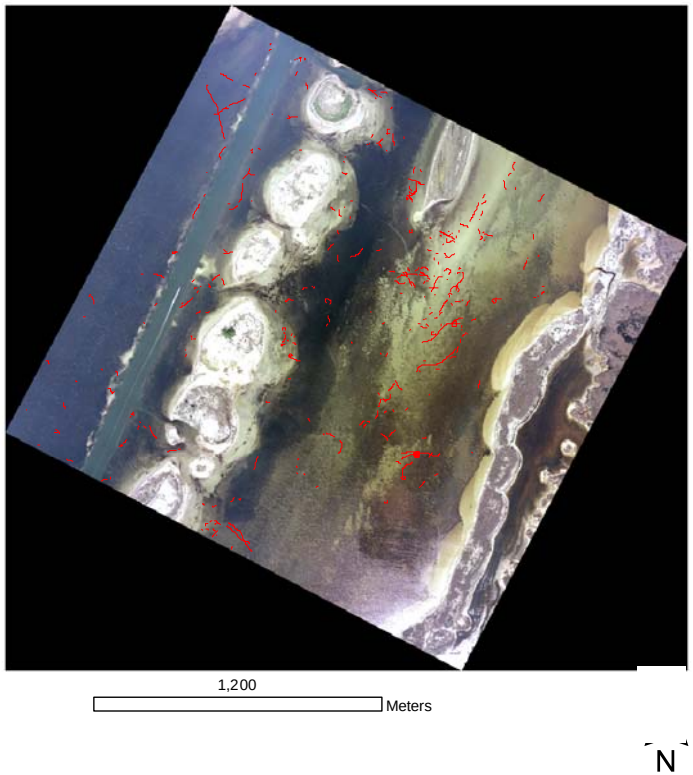
35.68 hectares scarred

30.1 % relative scarring

Photo # 2

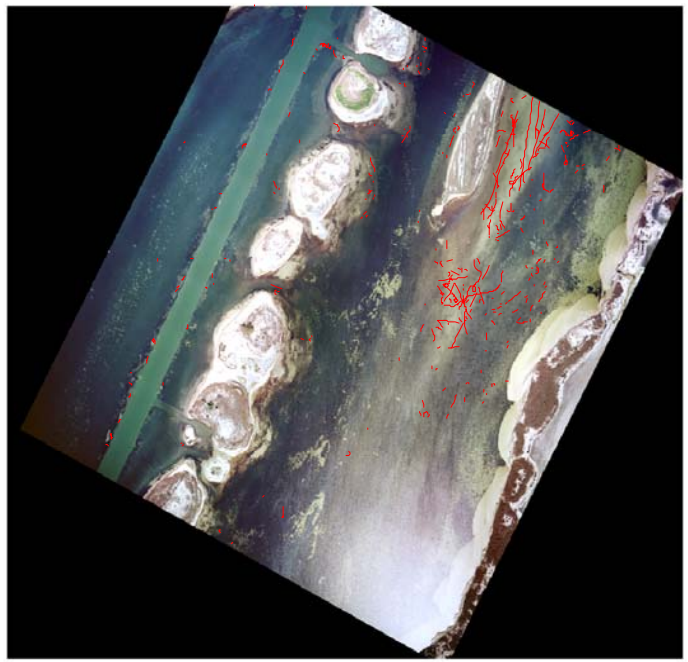
7.12 %
scarred

2002



6.58 %
scarred

2005



20.45 hectares scarred

30.1 % relative scarring

LIGHT

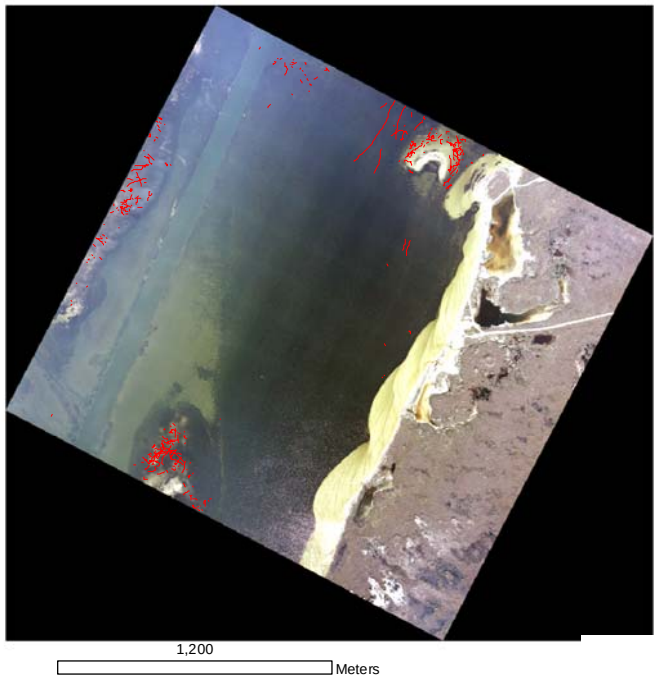
20.51 hectares scarred

32.6 % relative scarring

Photo # 3

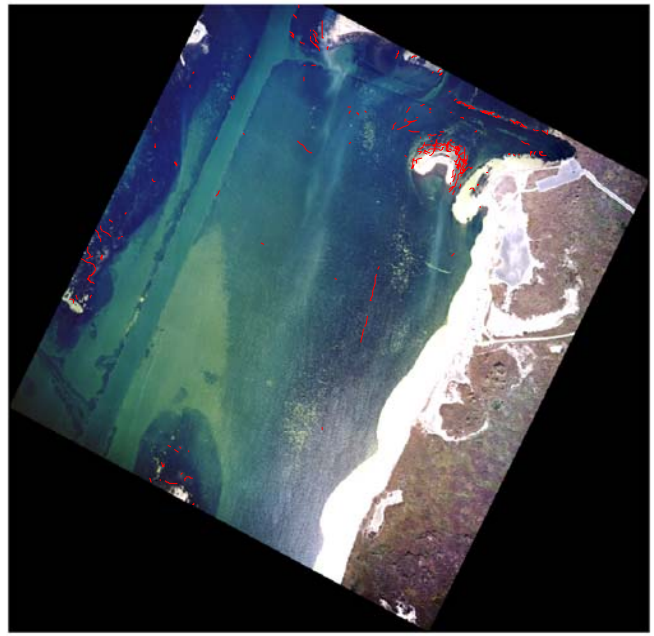
3.22 %
scarred

2002



2.32 %
scarred

2005



8.55 hectares scarred

12. 6 % relative scarring

MODERATE

6.73 hectares scarred

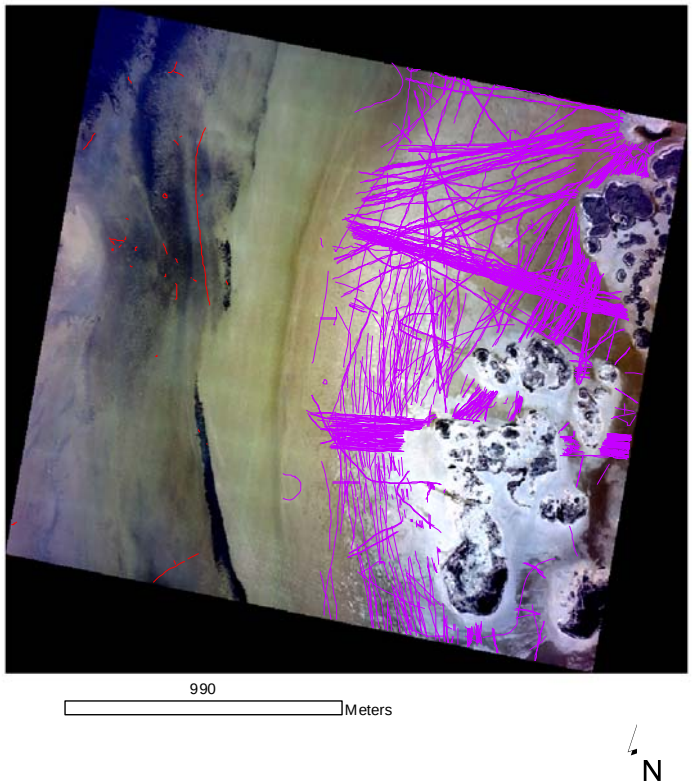
10.7 % relative scarring

Photo # 4

1.77 % scarred

38.3 % scarred

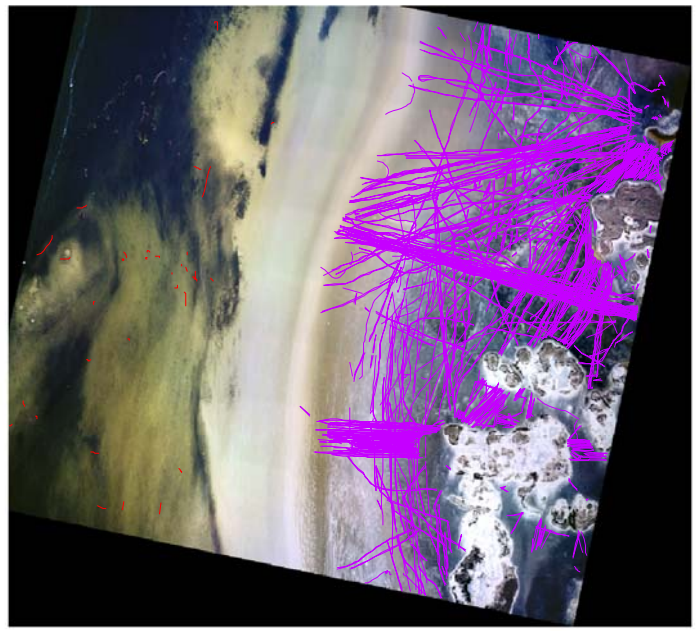
2002



< 1 % scarred

34.79 % scarred

2005



76. 51 hectares scarred

61.9 % relative scarring

SEVERE

84.10 hectares scarred

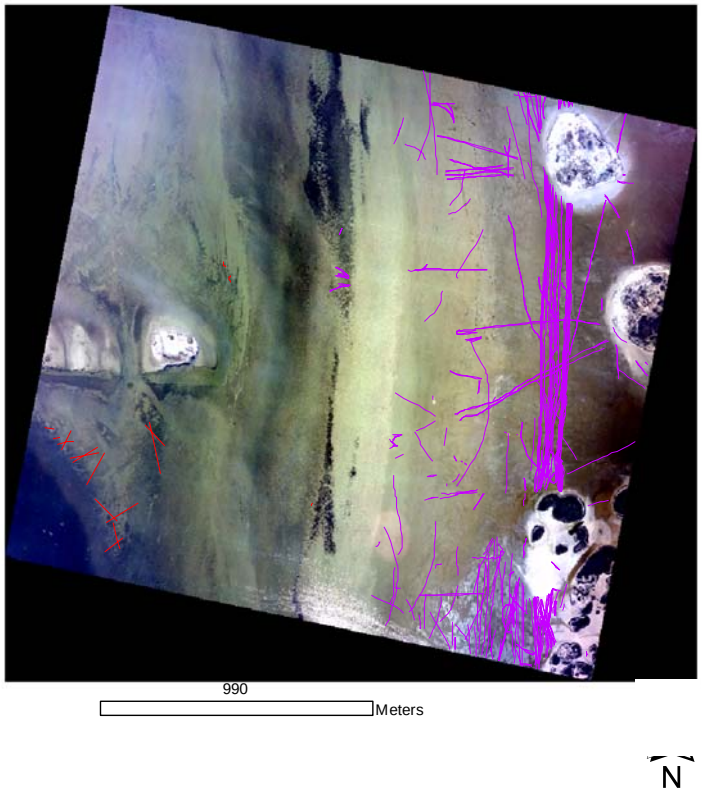
64.8 % relative scarring

Photo # 5

1.05 % scarred

16.84 % scarred

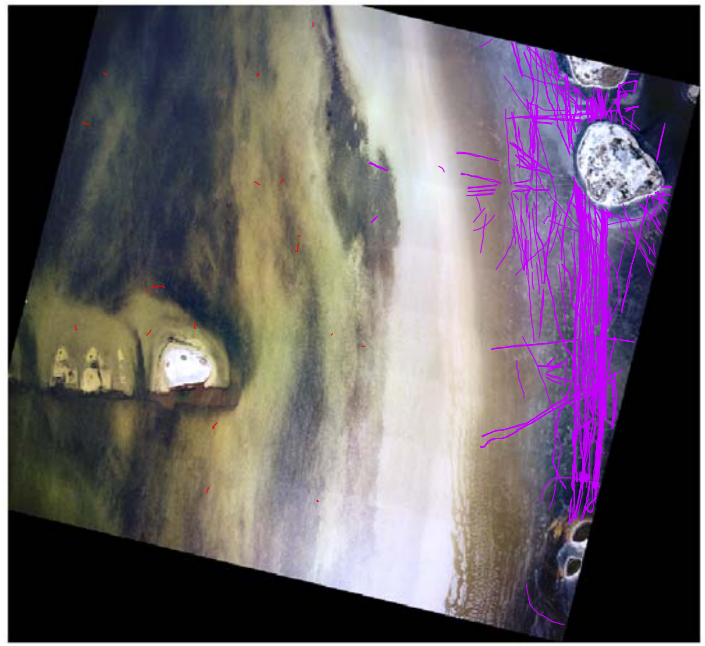
2002



< 1 % scarred

22.67 % scarred

2005



MODERATE

33.71 hectares scarred

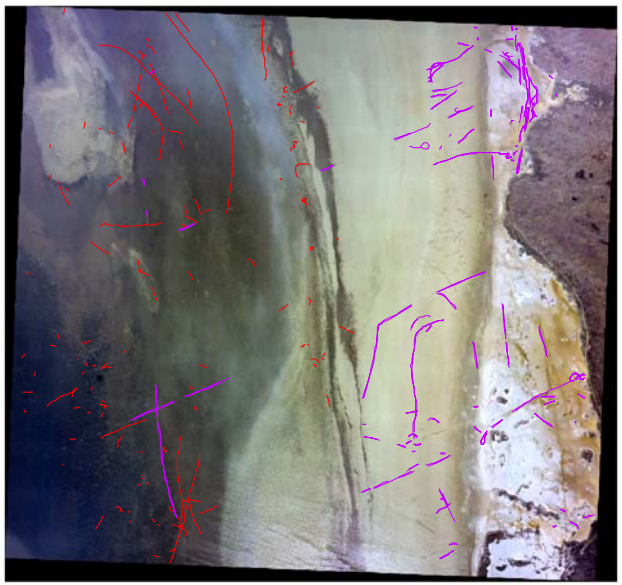
37.80 hectares

Photo # 6

7.73 % scarred

8.77 % scarred

2002



925

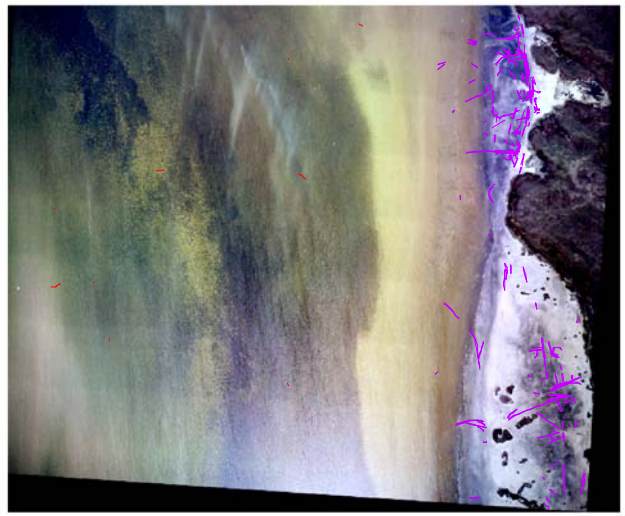
Meters

N

<1 % scarred

6.62 % scarred

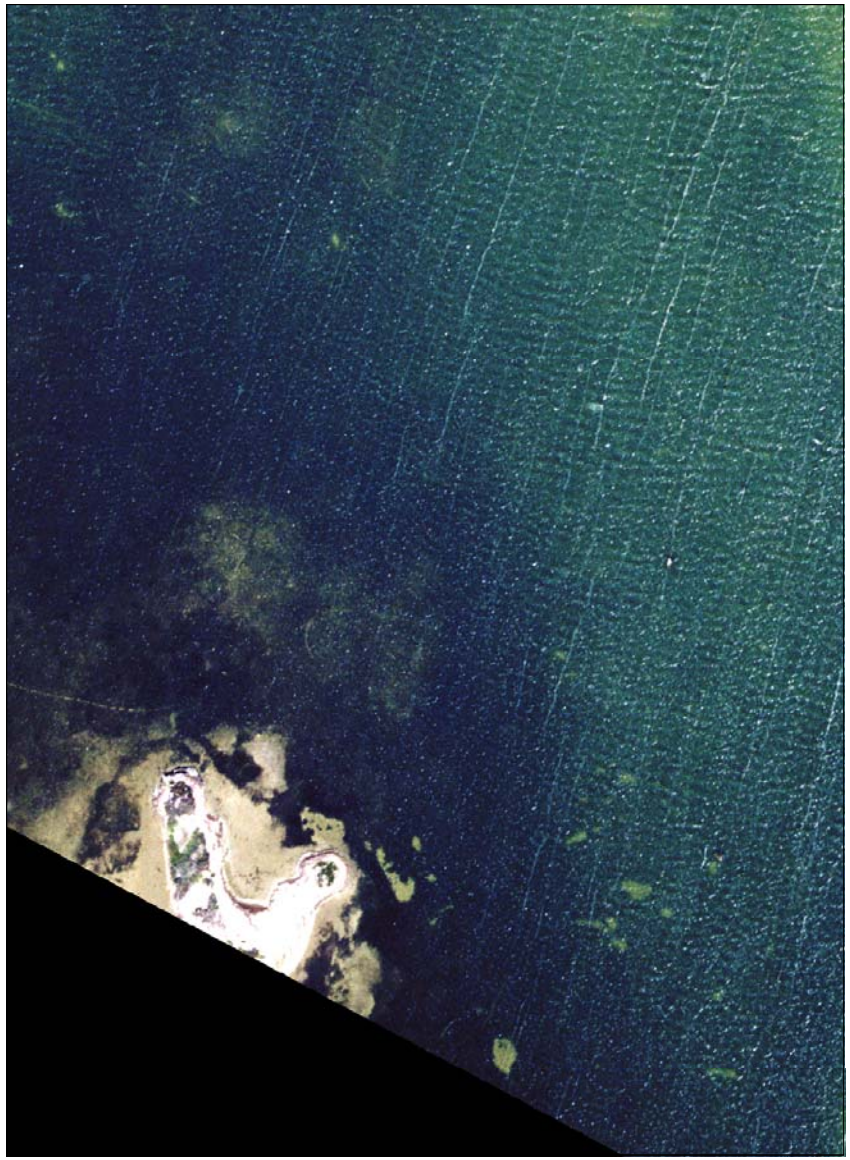
2005

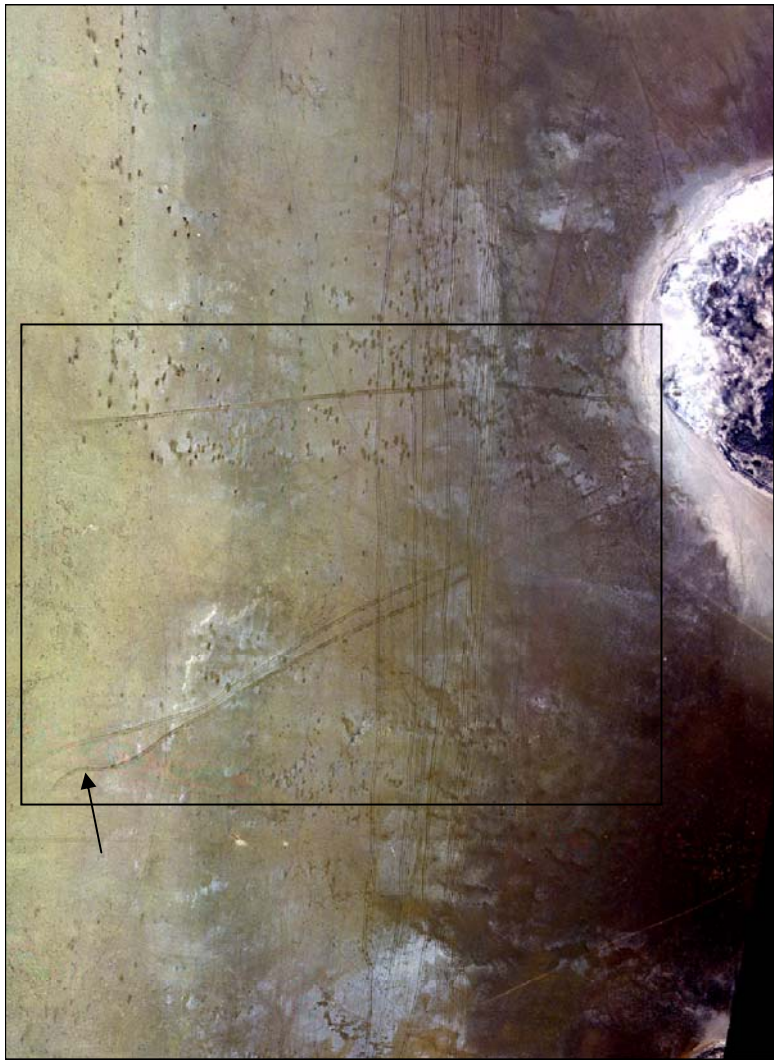


LIGHT

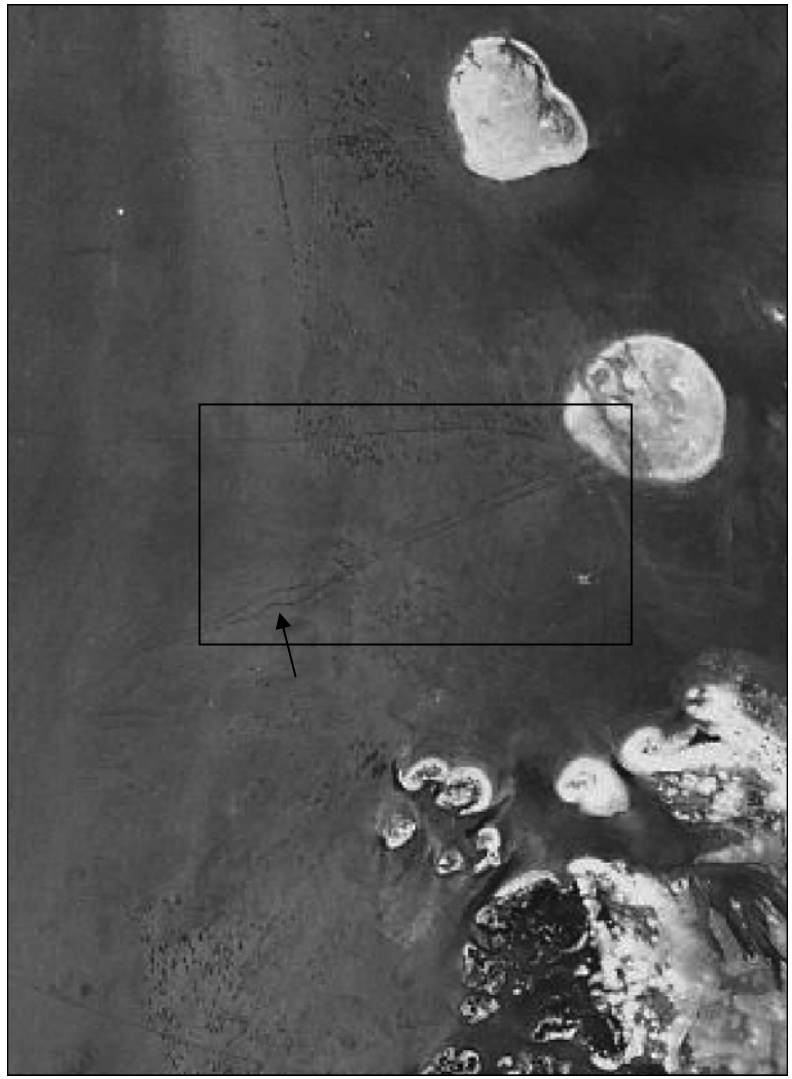
2002 (6 %)

2005 (<1 %)





2002



1967