

## X. APPENDICES - OTHER SUBJECTS

### Appendix Ya1. Salt River Marsh – Floods and droughts

Changes of the water level in the Salt River Marsh can be studied by using satellite images. Google Earth images are available from 1984 onwards. Most of the images before 2000 are somewhat blurred and in others, clouds make it difficult to discern features on the ground (Figures.1 and.2). The resolution of the images after 2000 is very good (Figure 3).



Figure 1. Satellite image from Dec 1984. The resolution is poor.



Figure 2. Satellite image from Dec 1986. Features obscured by the cloud cover.



Figure 3. Satellite image from April 2003. The quality of the image is higher.

It has been noticed that there are at least 2 sets of images: one which shows a large area, and the other shows a smaller area, as one zooms in, while the timescale at the top of the image changes from the set which starts in 1984 to the set which starts in 2003 (Figures 4 and 5). These two images are both from December 2008, but the water level in the marsh is not the same in the images.

Google-Earth image processing requires further investigation if one wishes to study time-related changes of the landscape.



**Figure 4. Satellite image from December 2008. The marsh is full.**



**Figure 5. Satellite image from December 2008, which was selected while zooming into the image in Figure 4. The marsh is dry. Which image to believe?**



The following images of the Salt River Marsh show changes in the water level in the years from which they were available, between 2009 and 2018 (Figures 6 to 12).

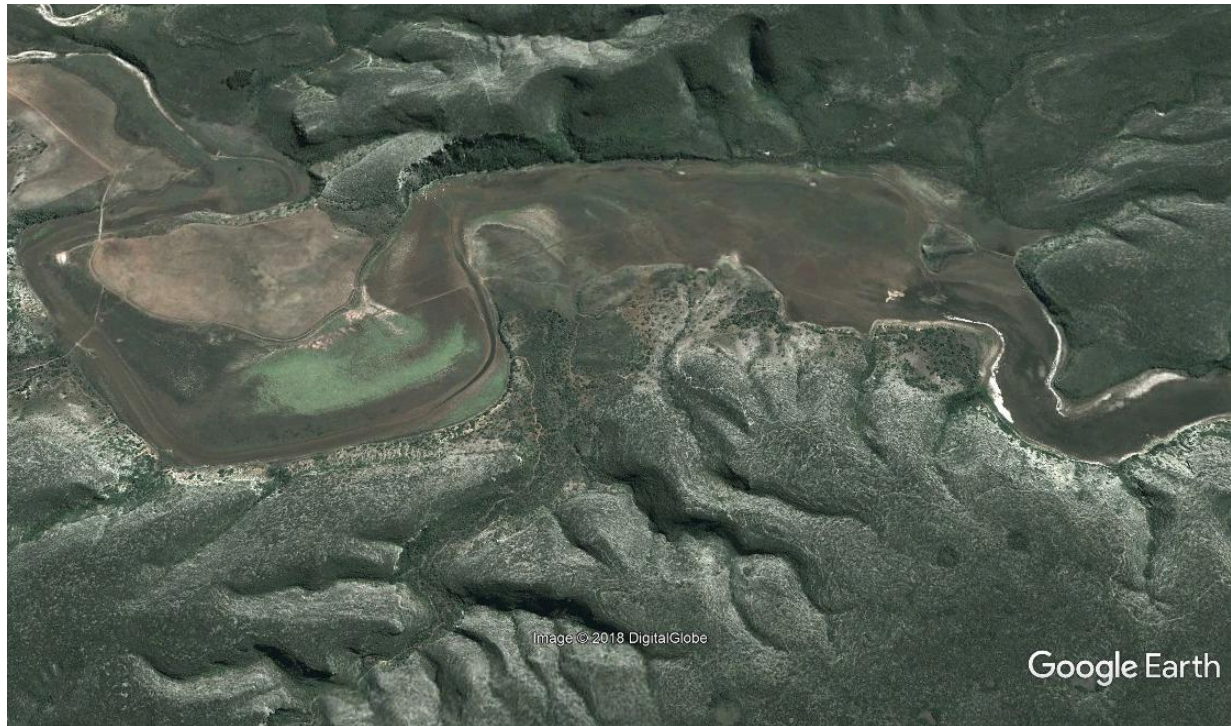


**Figure 6. Satellite image from August 2009.**

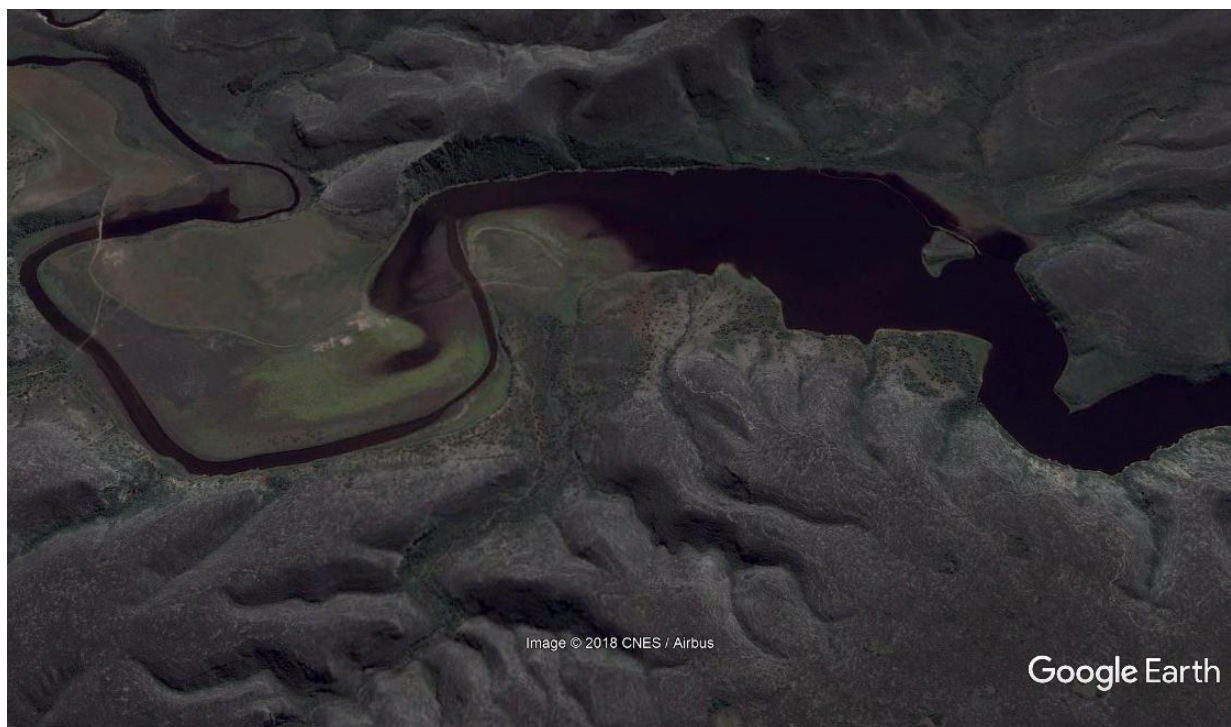


**Figure 7. Satellite image from August 2011.**



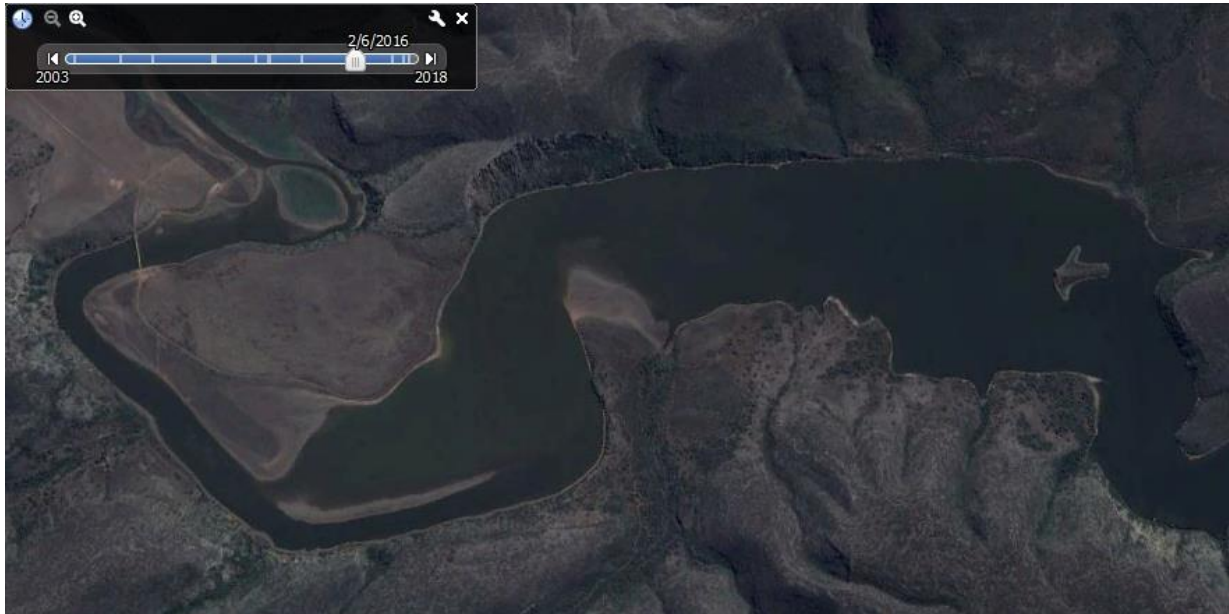


**Figure 8. Satellite image from January 2012.**

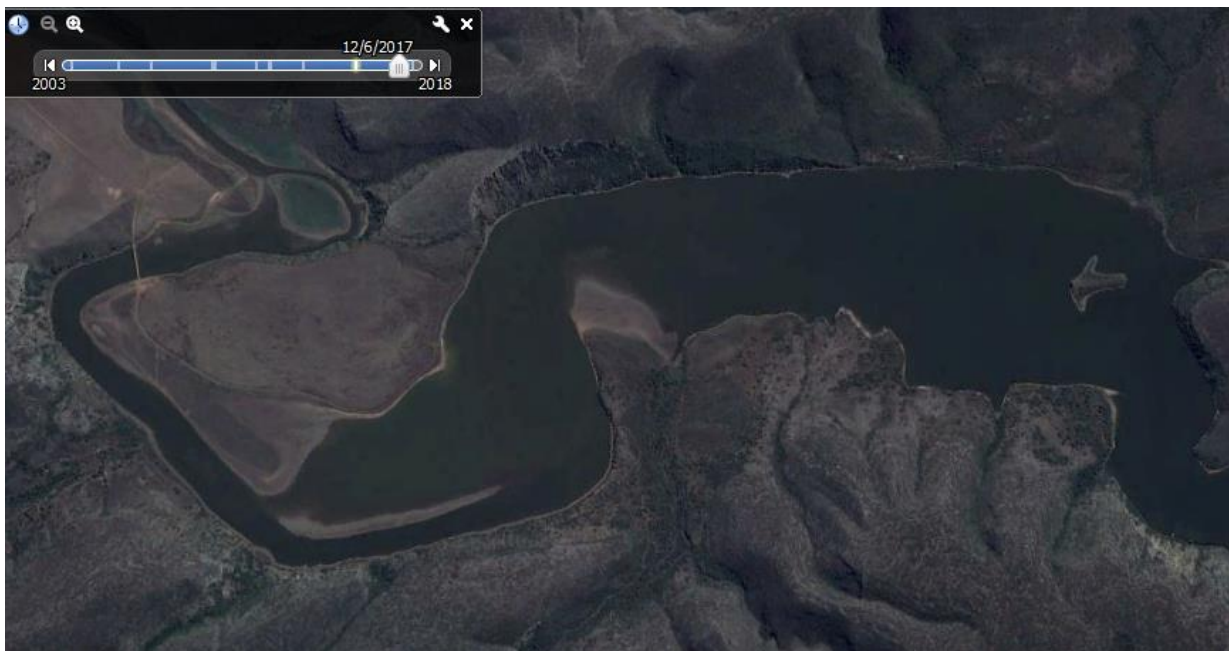


**Figure 9. Satellite image from February 2013.**

The water level in the Salt River Marsh in the following two images, from February 2016 and December 2017 (18 months apart!) look identical. It put a question mark on the reliability of the dates of the images.

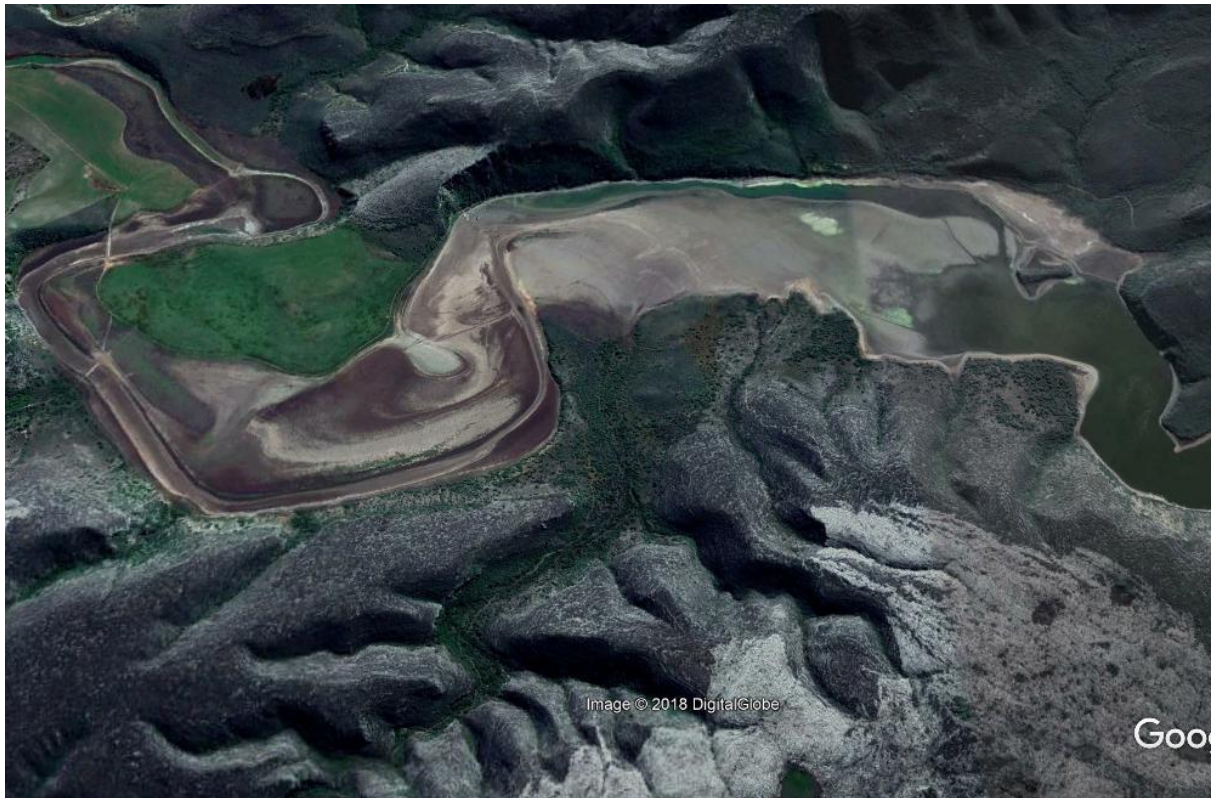


**Figure 10. Satellite image from February 2016.**



**Figure 11. Satellite image from December 2017.**





**Figure 12. Satellite image from September 2018.**



**Figure 13. Satellite image from November 2018.**