

# **Wildlife from Space: Detecting, monitoring and studying wildlife using satellite imagery**

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"The advent of Very High Resolution optical satellite imagery has enabled us to find and study wildlife in places and in ways that have not previously been possible. In theory, any large animal (>1m) in open terrain that has a high contrast with its surrounding environment could be monitored by satellite. The technology is particularly useful in remote and hard to access locations, or where multiple records would be difficult to acquire through other means. The availability of large amounts of coverage from satellites also enables regional and continental scale studies regardless of terrain, borders, or bureaucracy. Additionally, satellites do not disrupt behavior or disturb animals in ways that ships, ground, aircraft, or UAVs often do. In future traditional wildlife line-transect populations studies could be replaced by total area studies from automated VHR satellite imagery.

However, the extensive amounts of data that can be collected, coupled with the relatively low spatial resolution, offer unique challenges and questions; is multiple low resolution data of everywhere better than high-quality sparse data? Cost of imagery and analytical pipelines will also have to be addressed before optimal use of the technology can be made, both by the satellite providers and the users. To utilize the full capacity of the technology it will need interdisciplinary solutions using novel and groundbreaking machine learning techniques and big data pipelines.. Although often the techniques and methodologies can be transferred between species, many user cases show that behavioral knowledge of each species is still key to understanding results. Conservation users, remote sensing experts and machine learning practitioners will need to work together to build these data streams

In this talk we will present several groundbreaking examples from a decade of developing automated solutions using VHR and medium resolution satellite imagery on penguins, seals, whales, albatrosses and other species. We will discuss challenges, advantages and future directions of the use of this potentially revolutionary conservation tool."