

Exploring Movement Behavior in Association with Lead Exposure in Turkey Vultures (*Cathartes aura*)



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Introduction

Lead (Pb) Exposure in the Turkey Vulture

- Scavengers exposed to Pb through diet of carrions with Pb fragments
- Ecotoxicological and mortality risks

Why study migratory behavior?

- Reveal impacts of pollutants on the health of migratory species



Results

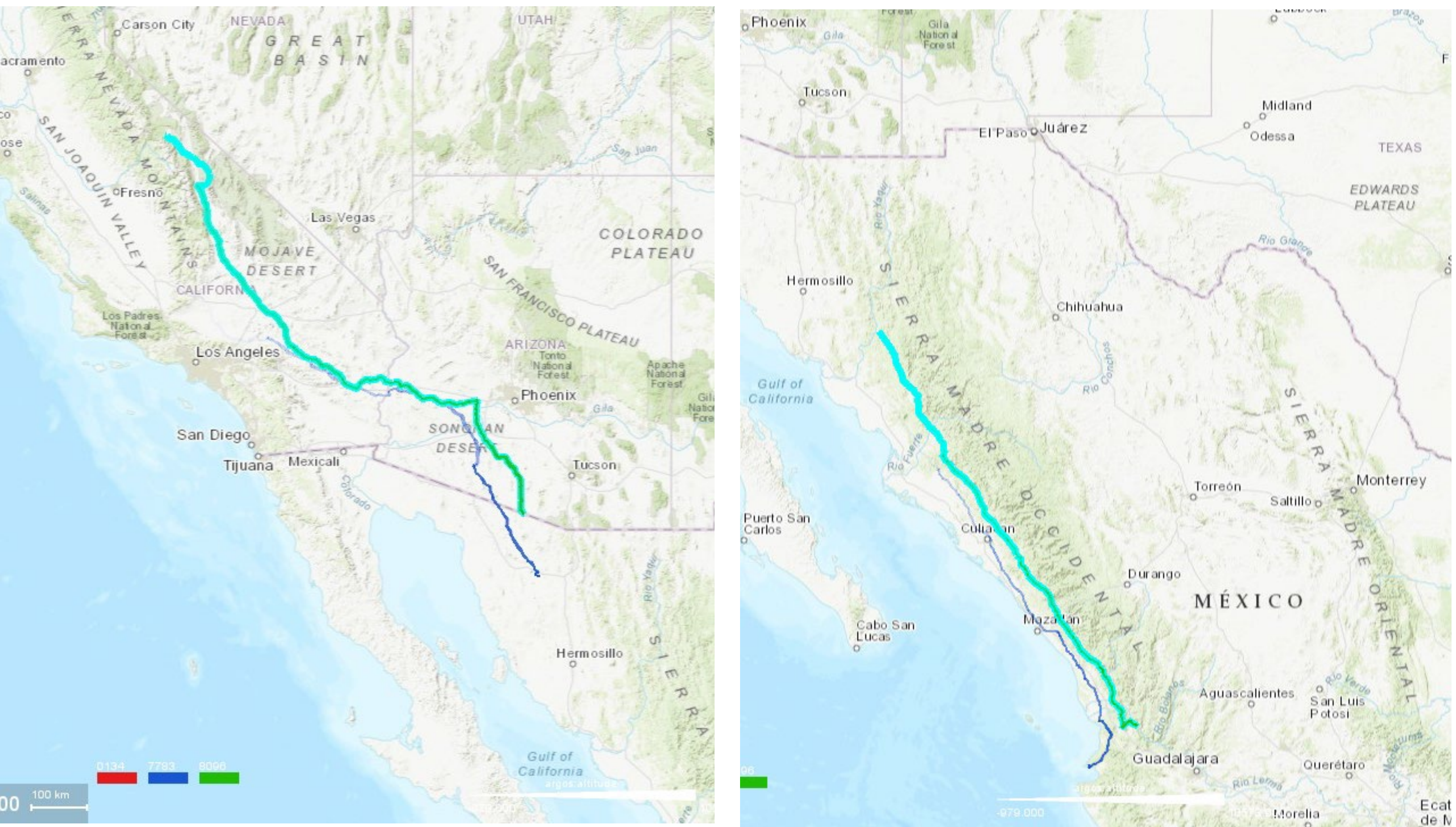


Figure 4 and 5. Both migratory Turkey Vultures migrating South from California to Mexico.

Scan the QR code to view an animation of both vultures during their Fall and Spring migration.



Figure 6. Turkey Vulture wingspan.



Figure 7. Migratory Vulture in April 2022.

Discussion

Visualization of Movement Allows Us to Test:

- Detrimental effects of Pb exposure on physiology and migratory behavior of Turkey Vultures



Figure 8. Larry the lure bird in walk-in trap.

Importance of Visualization of Turkey Vulture Movement

- Obtain individual level statistics Turkey Vulture flight
- Associate individual level statistics with environmental variables
- Hypothesize what aspect of flight is changed from Pb exposure

Materials and Methods

Measuring Pb exposure

- *Feathers:* Inductively coupled mass spectrometry (ICP-MS)
- *Blood:* Anodic Stripping Voltammetry

How many TUVU captured?

- 40 resident and 7 migrant vultures
- 3 migrants with GPS units

Movement Tracks Display

DYNAMOvis (Dodge et al., 2021):

- software for mapping and visualization of movement data



Figure 1. Trap locations for Turkey Vultures.



Figure 2. Turkey vulture in trap with GPS attached.

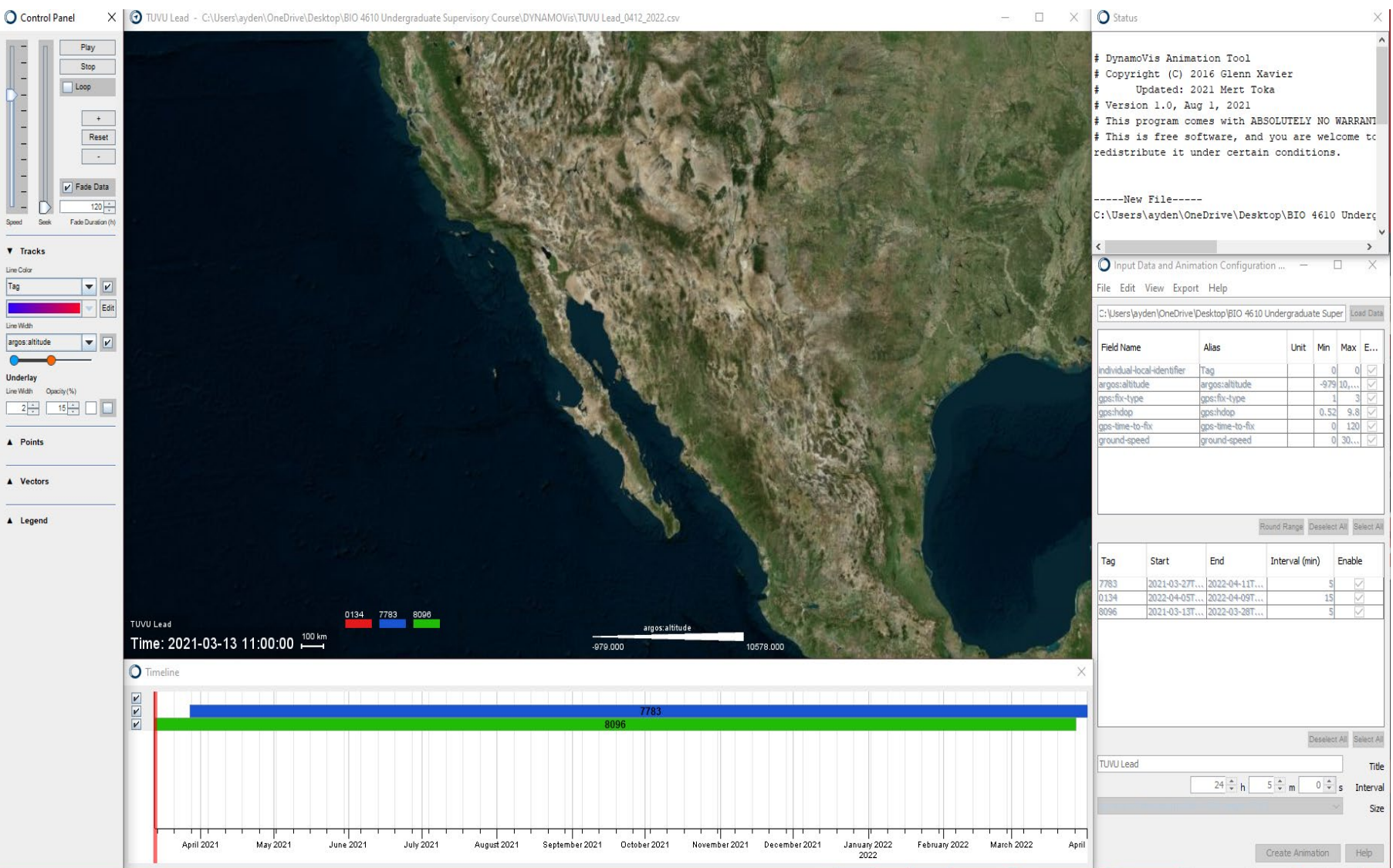


Figure 3. DYNAMOvis software with labeled components.

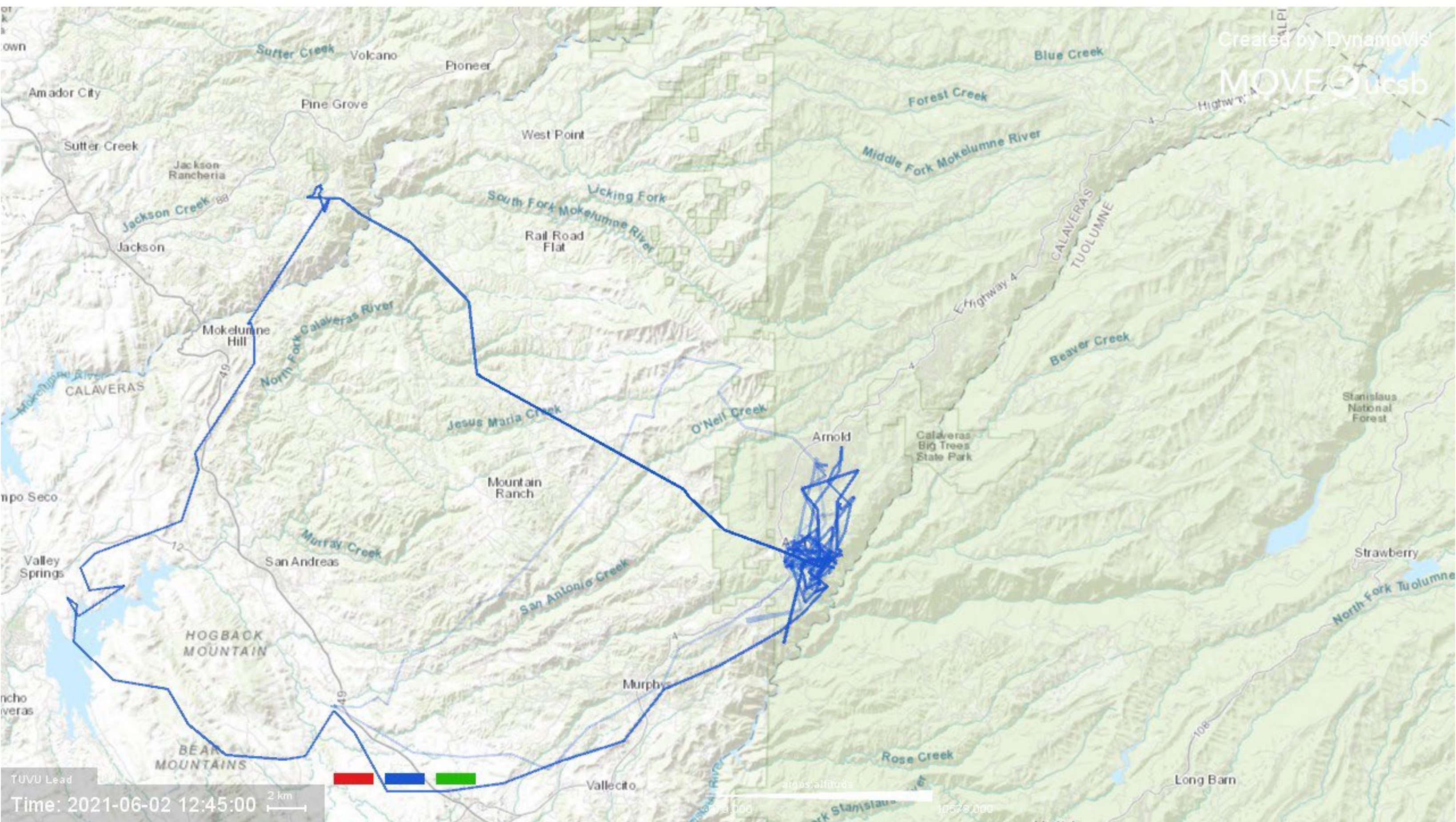


Figure 7. Zoomed in capture of Turkey Vulture 7783 traveling locally.

Scan the QR code to view an animation of Vulture 7783 and 8096 traveling near the Sierra Nevada Mountains



Future Work

- Identify potential impairment to physiology and brain function and/or an increase in mortality due to Pb exposure
- Assess the individual responses to environmental (anthropogenic) changes (Nathan et al., 2022)

Acknowledgements

References:

Dodge et al., 2021 *Mov Ecol* 9, 55
Nathan et al., 2022 *Science* 375, 734

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