



Mountain GeoScience Group
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Universidad
de Concepción

RPAS for studying Mountain environments: lessons from the Chilean GOAIR

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Outline

- Drone/UAV development from Chile
- GOAIR Armada
- Applications in Chilean mountain environments
- Lessons and challenges

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Drone/UAV development from Chile

- Universidad de Concepción (UdeC) offers the only Aerospace Engineering program in the country.
- Most drone development is for leisure, and black-box solutions are the norm.
- Few experiments are now trying to apply UAV technology to monitoring landscapes and natural hazards.
- GOAIR-UdeC stands for “Grupo de Operaciones, Aplicaciones e Investigación en RPAS”

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GOAIR Armada

SOME OF OUR PLATFORMS



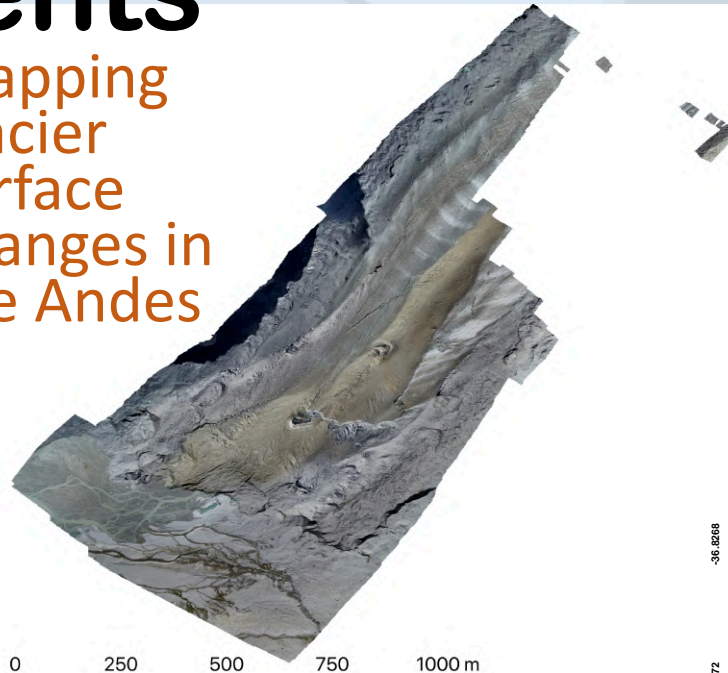
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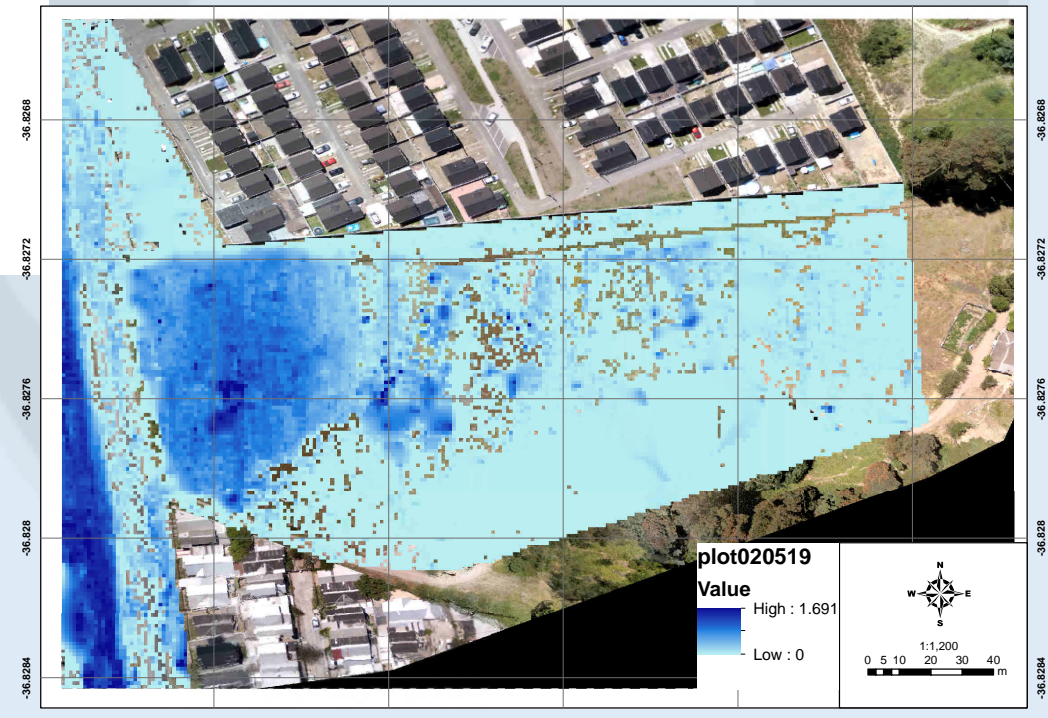
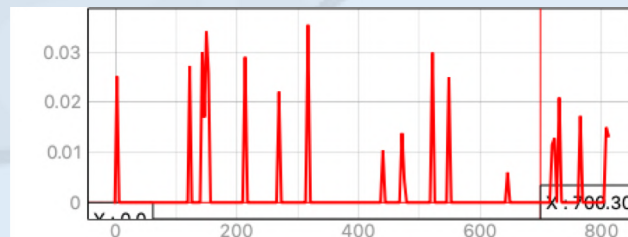
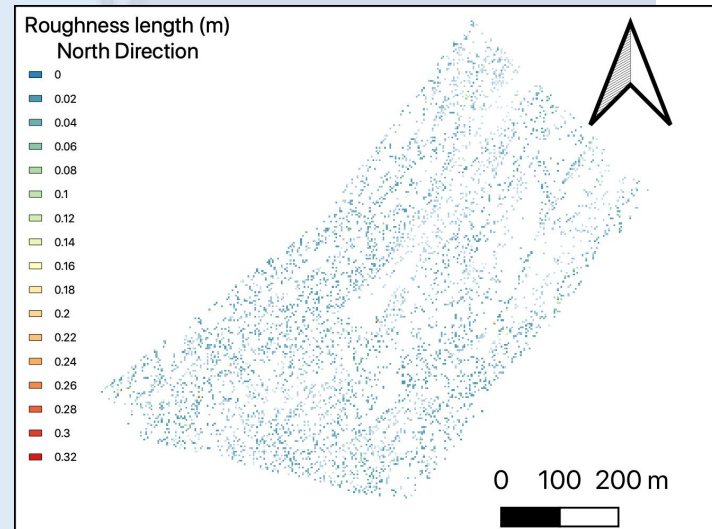
Applications in Chilean mountain environments

Developing statistical models to extract more data from UAV sensors

Mapping glacier surface changes in the Andes



Mapping flooding and landslide hazards in the foothills of the Chilean Coastal Range



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Lessons and challenges

- Building and testing your own system is rewarding although you must accept a lot of failures (i.e. crashes!).
- In the Chilean Andes case, it is difficult to maintain GPS coverage for RTK geolocation of photos and thus GCPs are necessary.
- But this means there are sections you can't reach and you don't know much of the accuracy.
- Topography from UAVs can be of very high resolution (even below the cm), but positioning may not (a couple of cm, even though your software says otherwise!) and thus we believe there's still a limit of representation to about 5cm pixel size for DEMs.
- This resolution looks very OK to trace ice movement, rock movement, and other fine elements that can contribute to natural hazards. But (geolocated!) microtopography is still difficult to measure.
- Using these high resolution DEMs provide good data for numerical modeling, but we have seen that sometimes these models get "overwhelmed" and do not improve significantly what we can learn from coarse resolution studies.



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Thank you!

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