



UNIVERSITA' DEGLI STUDI
DELLA BASILICATA

Growing
ideas
through
networks



Use of UAS for Environmental Monitoring

Prof. Salvatore Manfreda

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Chair of the COST Action Harmonious - <http://www.costharmonious.eu>



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of the European Union

COST Action HARMONIOUS

A network of scientists is currently cooperating within the framework of a COST (European Cooperation in Science and Technology) Action named “HARMONIOUS”.

The intention of “HARMONIOUS” is to promote monitoring strategies, establish harmonized monitoring practices, and transfer most recent advances on UAS methodologies to others within a global network.

<https://www.costharmonious.eu>

HARMONIOUS Action

Action Chair Salvatore Manfreda
Vice Chair Brigitta Toth
Science Communications Manager:
Guiomar Ruiz Perez
STSM coordinator: Isabel De Lima
Training School Coordinator:
Giuseppe Ciruolo

WG1: UAS data processing

Leader Pauline Miller
Vice leader Victor Pajuelo
Madrigal

Geometric Correction
and image calibration

Contrast
Enhancement

WG2
Vegetation Status
Leader Antonino Maltese
Vice leader Felix Frances

WG3
Soil Moisture Content
Leader Zhongbo Su
Vice leader David
Helman

WG4
Leader Matthew Perks
Vice leader Marko Kohv

River morphology

Stream flow

WG5: Harmonization of
methods and results
Leader Eyal Ben Dor
Vice leader Flavia Tauro

Harmonization
of different
procedures and
algorithms in
different
environments

HARMONIOUS
uas for environmental monitoring

Numbers of the COST Action Harmonious



216 Researchers
36 Countries involved
Total budget 780k€
Period November 2017 – November 2021

Activities Promoted

- Workshops**
- Working Group Meeting**
- Training Courses**
- STSMs**



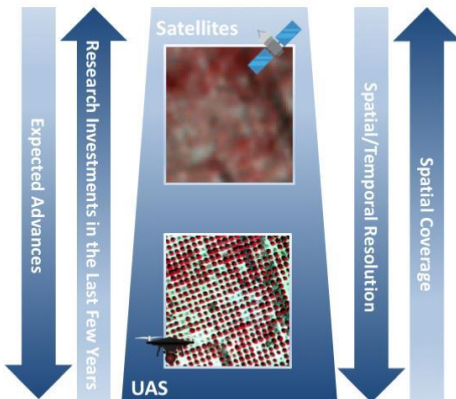
POSITIVE RECENT RESULTS



Review

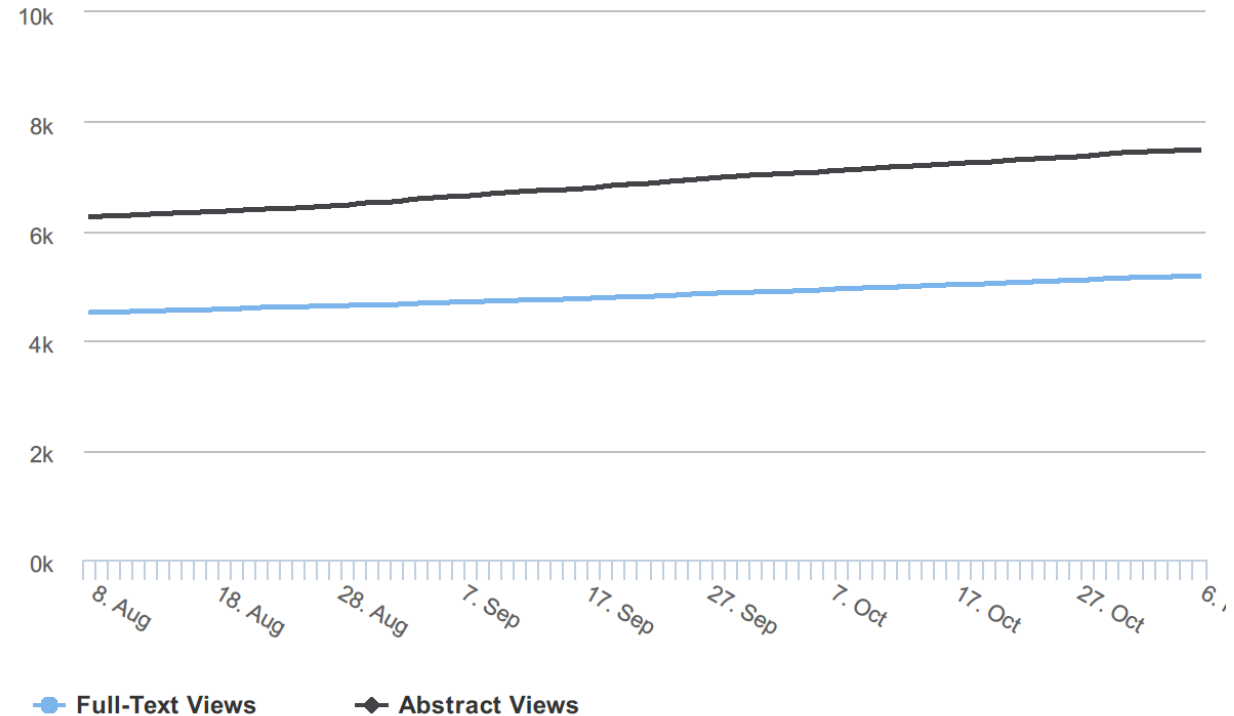
On the Use of Unmanned Aerial Systems for Environmental Monitoring

Salvatore Manfreda ^{1,*} , Matthew F. McCabe ² , Pauline E. Miller ³ , Richard Lucas ⁴, Victor Pajuelo Madrigal ⁵ , Giorgos Mallinis ⁶ , Eyal Ben Dor ⁷, David Helman ⁸ , Lyndon Estes ⁹ , Giuseppe Ciruolo ¹⁰ , Jana Müllerová ¹¹, Flavia Tauro ¹², M. Isabel de Lima ¹³ , João L. M. P. de Lima ¹³ , Antonino Maltese ¹⁰ , Felix Frances ¹⁴ , Kelly Caylor ¹⁵, Marko Kohv ¹⁶, Matthew Perks ¹⁷, Guiomar Ruiz-Pérez ¹⁸ , Zhongbo Su ¹⁹, Giulia Vico ¹⁸ and Brigitta Toth ^{20,21}



Views	7484
Downloads	5178
Citations	57
Altmetrics	11

Article access statistics



POSITIVE RECENT RESULTS



Article

Assessing the Accuracy of Digital Surface Models Derived from Optical Imagery Acquired with Unmanned Aerial Systems

Salvatore Manfreda ¹, Petr Dvorak ², Jana Mullerova ³, Sorin Herban ⁴, Pietro Vuono ⁵, José Juan Arranz Justel ⁶, and Matthew Perks ⁷

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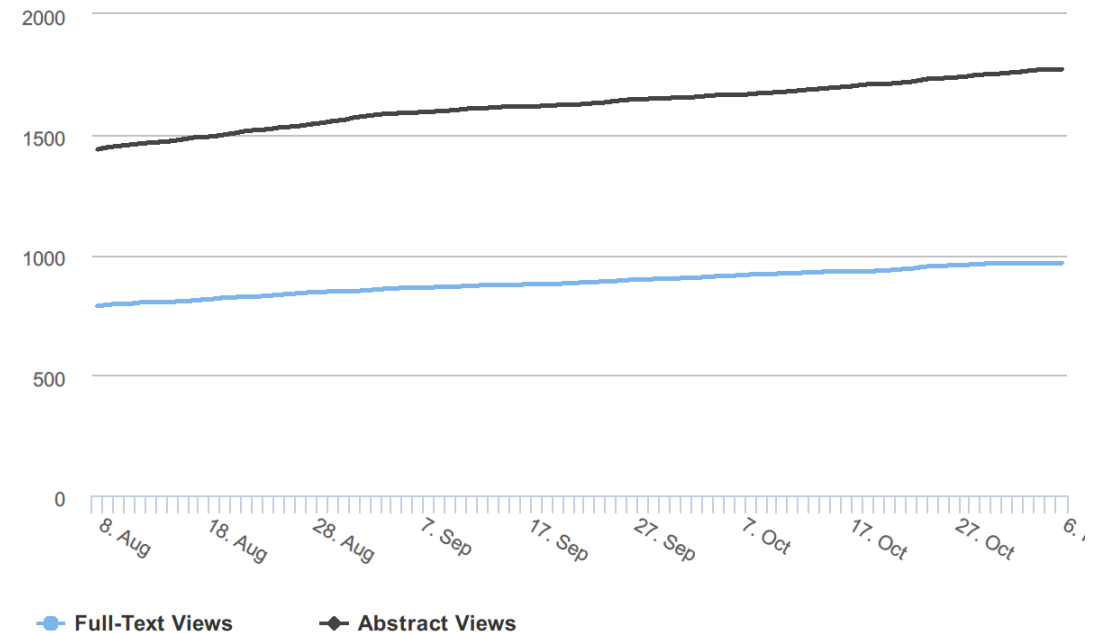
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Views	1771
Downloads	966
Citations	6
Altmetrics	10



Article access statistics

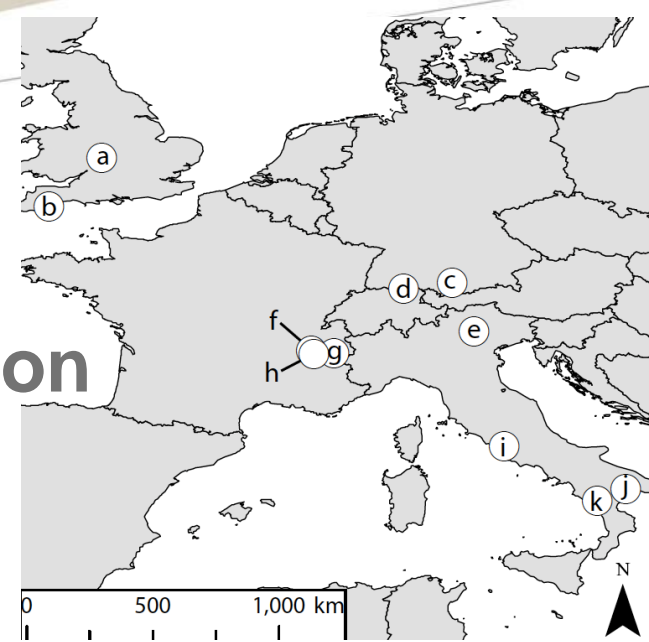


Stream Flow Monitoring – Data Collection for Benchmarking Optical Techniques

<https://doi.org/10.5194/essd-2019-133>
Preprint. Discussion started: 26 September 2019
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Earth System
Science
Data
Discussions



Towards harmonization of image velocimetry techniques for river surface velocity observations

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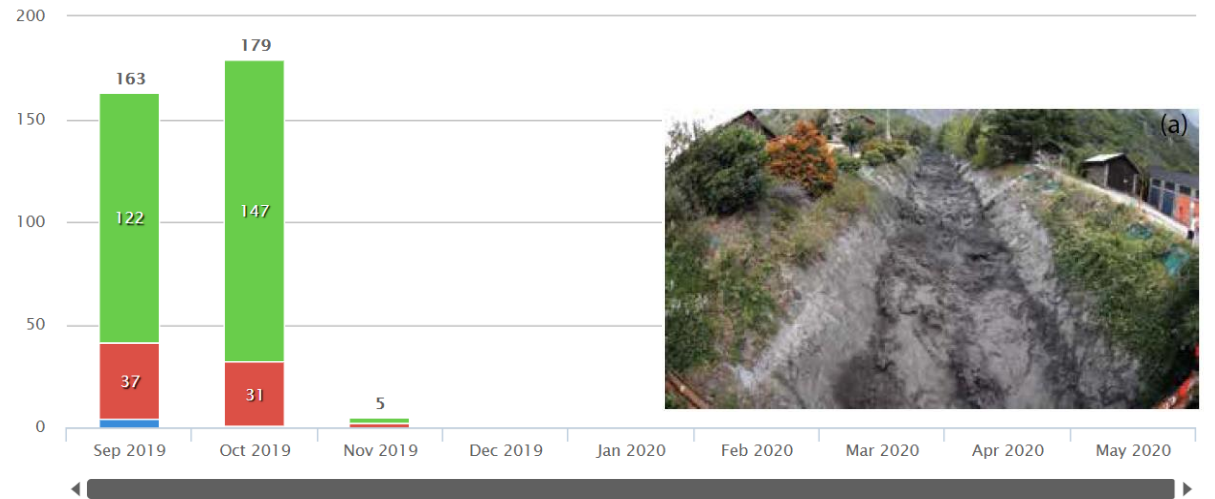
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Correspondence: Matthew T. Perks (matthew.perks@ncl.ac.uk)

Image velocimetry data available for 12 case studies

HTML	PDF	XML	Total	BibTeX	EndNote
272	70	5	347	2	0

Views and downloads (calculated since 26 Sep 2019)



Special Issue "Hydrological and Environmental Modeling: from Observations to Predictions"

We welcome contributions dealing with, but not limited to, the following topics:

- The potential of remote sensing observations to improve our hydro-environmental knowledge;
- The use of remote sensing observations for data assimilation and model calibration;
- Model calibration using a combination of spatial and point observations with different characteristics (support, spacing, extension, and reliability);
- Multi-objective calibration using different state variables;
- Models up-scaling and down-scaling;
- The definition of new model performance metrics and statistics;
- Uncertainty propagation from observations to estimated parameters and/or model results.



Special Issue "Progress on the Use of UAS Techniques for Environmental Monitoring"

The Special Issue is dedicated to multidisciplinary contributions focusing on the demonstration of the benefit of UAS data and algorithms for environmental monitoring. The research presented might focus on:

- Added value of UAS data in environmental monitoring;
- Methods and procedures for UAS data processing;
- Use of UAS in precision farming;
- Innovative applications of UAS data for rapid environmental mapping and change detection;
- Advanced applications of UAS data for monitoring vegetation state, crop production, soil water content, river evolution, and stream flow;
- Potential of different sensors (e.g., thermal, visual, radar, laser, and/or their fusion) and algorithms for environmental variables.



Special Issue “UASs for Surface Hydrology”

This Special Issue welcomes contributions that involve the use and development of UAV technology for the advancement of our comprehension of surface hydrological processes. More specifically, submitted manuscript may cover the following topics:

- UAV-based measurement in diverse compartments of the water cycle, including application to rainfall, surface water, river bathymetry, soil moisture, vegetation, temperature, and evapotranspiration measurements
- Development and integration of sensors onboard UAV platforms for advanced hydrological measurements
- Establishment of procedures and protocols for UAV-based hydrological observations
- Assessment and comparison of UAV-based measurements to more established technologies
- Development of algorithms for UAV-based data extraction
- Analysis and assimilation of UAV-based measurements in hydrological models
- Development of advanced multisensor UAV platforms for surface hydrology
- Integration of UAV technology within collaborative projects and citizen scientist

Deadline 31 December 2019