



Development of a Remote Sensing and Unmanned Aircraft Systems Handbook for Disaster Response

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Background

- GIS (Geographic Information Systems) and UAS (Unmanned Aircraft Systems) are important technological tools that have emerged in the last 30 or so years, with many potential and groundbreaking uses in emergency management.
- These new technologies have opened unprecedented opportunities in which emergency management, disaster response, and law enforcement entities can respond to disasters in completely new ways. The functionality of UAS and GIS technology have portrayed an impressive adaptability to be manipulated to best address the different types of disaster scenarios: anything from urban search and rescue to hazmat protocols through both a unique land and aerial view.
- As these technologies continue to increase in both their capabilities and span of usage, it is necessary to ensure that there is an adequate system of precautions and procedures to create a streamlined universal usage. The purpose of this research was to compile some of these techniques in differing areas of emergency management and create new standardized workflows from them through a combination of literature reviews of case studies and guidebooks, and an analysis and test of these methods through expert experience.

Methodology

Previously established materials to outline disaster response were as follows:

- team workflows - systems outline and assign repetitive tasks –
- Compiling of information from online academic sources
- In-field testing of workflows and processes

These were reviewed and compared to use as foundations and materials for the workbook. This system of analysis allowed for previous expertise to be compared and incorporated into the project to help refine and guide the workflows and targeted techniques compiled into the handbook.

Preliminary Results

Example Handbook Section: "This document has been developed from years of after-action reports, lessons learned, and best practices and serves as an adaptable guide for performing UAS missions in the field. This document is open-source (see license info) and can be changed, adapted, and revised as necessary to meet specific agency needs. In addition to the requirements for reuse, as stated in the license, users of this document should refrain from making changes that impact the interoperability of disparate UAS resources. Effectiveness in teams will be reduced if some teams use the technology and workflows described in this document and other agencies use different, and usually incompatible, methods."

Imagery

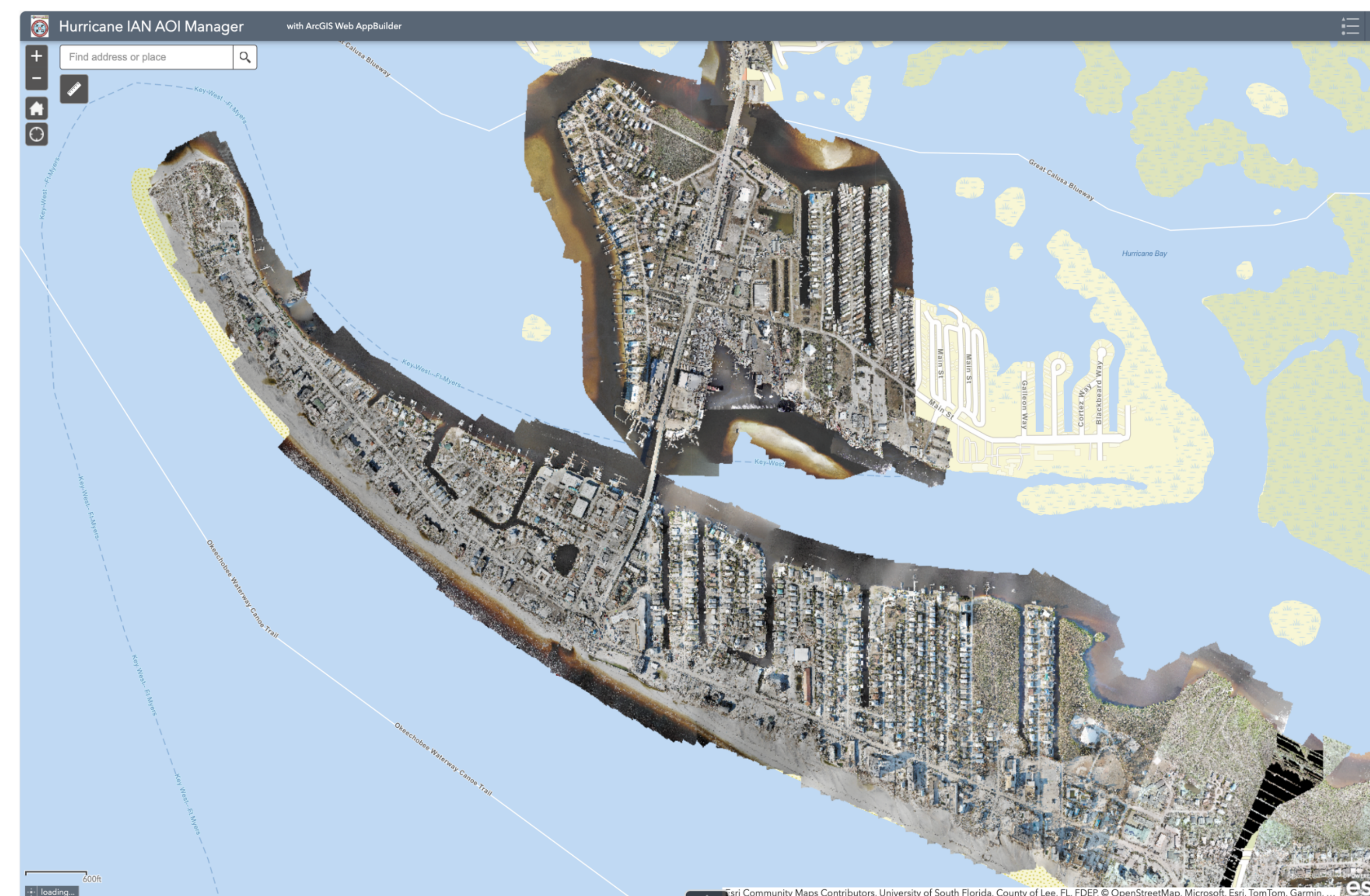


Figure 1: GIS mapping of Fort Myers after hurricane IAN; Taken by David Merrick's team.



Figure 2: Image taken while field testing written workflows.

Conclusion and References

The background research done also highlighted the wide and varying applications of GIS and UAS within an emergency management context. The necessity to clarify the methodology for each disaster response situation and the technological applications was further highlighted throughout the development of this handbook. This handbook is useful for further organizing the field of emergency management procedures and techniques, to broaden the applicability of these technologies throughout the world.



Acknowledgments

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