



5th SWAN Progress Meeting Program 2014
Towards a Framework for a Transatlantic Dialogue on Water:
What Role for The University of Arizona?



**Application of VIC Hydrological Model for
Quantification and Mapping of Flood Regulating
Ecosystem Services in Arizona, USA: Land and Water
Management Implications**

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Key points

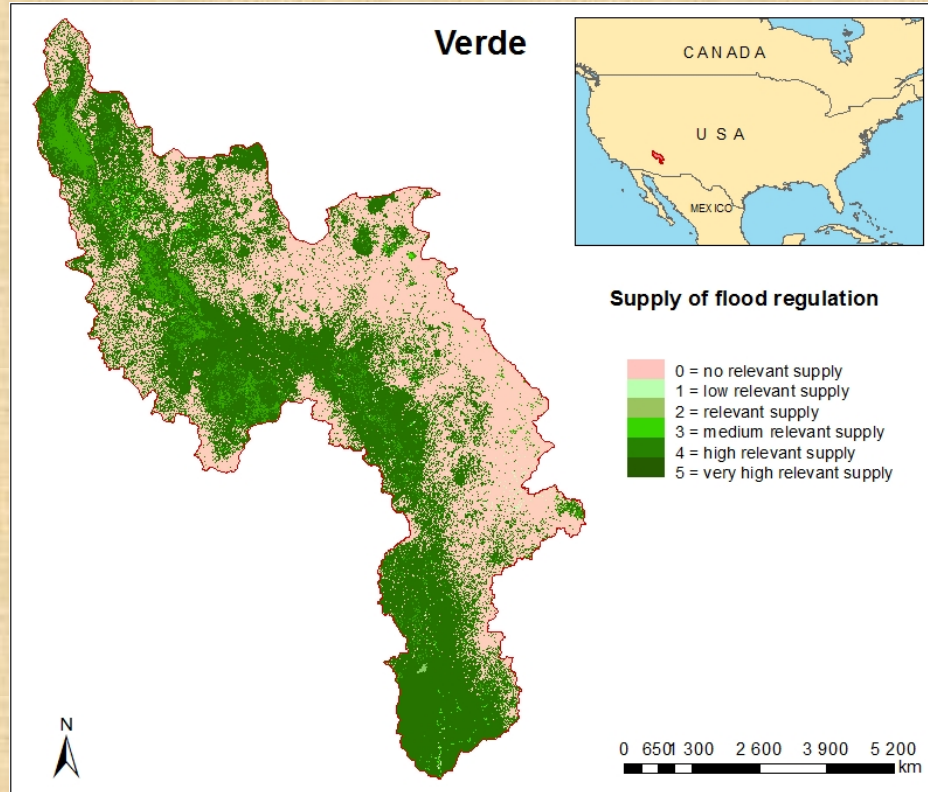
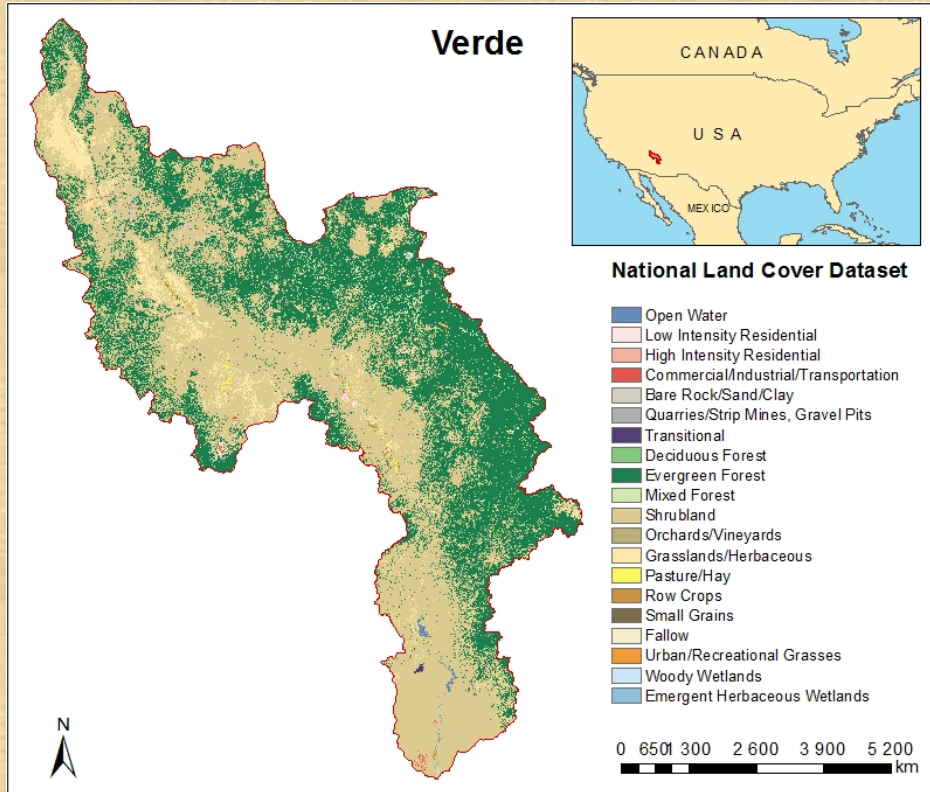
- General objectives of your research
- Where are you on your research? (background information, fieldwork, completer paper, etc.)
- Key research questions
- Map/define the scale of research: challenges, opportunities
- *Stakeholder map (overlaps redundancies)*
- Methodological approaches/theoretical frameworks
- What information do you need (geophysical, socioeconomic, institutional, etc.)

General objectives

- Assessment of the **capacity** of different land cover types to **regulate floods** in semi-arid areas
- Application of the **VIC hydrological model** for quantification of those capacities
- **Mapping** the capacities of different land cover types to regulate floods
- Informing **stakeholders and decision-makers** on the risks that different land use practices carry in relation to floods.

Where are you on your research?

- Preliminary results are available – gaps in the methodology. Working on it.
- No paper is been prepared yet



NLCD National Land Cover Dataset	Verde
11 Open Water	5
21 Low Intensity Residential	5
22 High Intensity Residential	3
23 Commercial/Industrial/Transportation	5
31 Bare Rocks/Sand/Clay	3
32 Quarries/Strip Mines, Gravel Pits	4
33 Transitional	2
41 Deciduous Forest	1
42 Evergreen Forest	0
43 Mixed Forest	0
51 Shrubland	5
61 Orchards/Vineyards	4
71 Grasslands/Herbaceous	4
81 Pasture/Hay	5
82 Row Crops	5
83 Small Grains	4
84 Fallow	4
85 Urban/Recreational Grass	3
91 Woody Wetlands	5
92 Emergent Herbaceous Wetlands	3

Key research questions

- How to choose the **appropriate output variables** from VIC in order to quantify flood regulating capacities?
- How to analyze those variables in order to receive **optimal results**?
- How to prepare the outputs in a way that is **informative and useful** for decision-makers and suggests appropriate land management practices in semi-arid the area (in relation to floods)?

Map/define the scale of research: challenges, opportunities

- A **methodology** for the application of the VIC hydrological model for quantification of flood regulation **does not exist** and its development demands **deep understanding** of the model and ecosystem services analyses principles
- The **interpretation** of the results is **challenging**, but a successful methodology will supplement significantly the field of ES quantification.
- **Flash floods** are significant **issue in Arizona**, but it has often been **neglected** due to the bigger magnitude of drought events
- It is important to communicate the **connection between land management and floods** to decision-makers
- The analyses can be applied with **climate and land cover change future scenarios**

Methodological approaches/theoretical frameworks

- Hydrological modeling (VIC)
- Ecosystem services analysis
- Mapping of ecosystem services (ArcGIS, the Matrix)

What information do you need?

- We wait for the final outputs of the model
- **Which are the stakeholders to which such results should be reported? How?**

Thank you!

Gracias!

Merci!

Dank u!

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Благодаря!

