COLOMBIA MI PRONÓSTICO FLOOD APPLICATION

Updating and improving the Mi Pronóstico Flood Web Application to Include an Assessment of Flood risk

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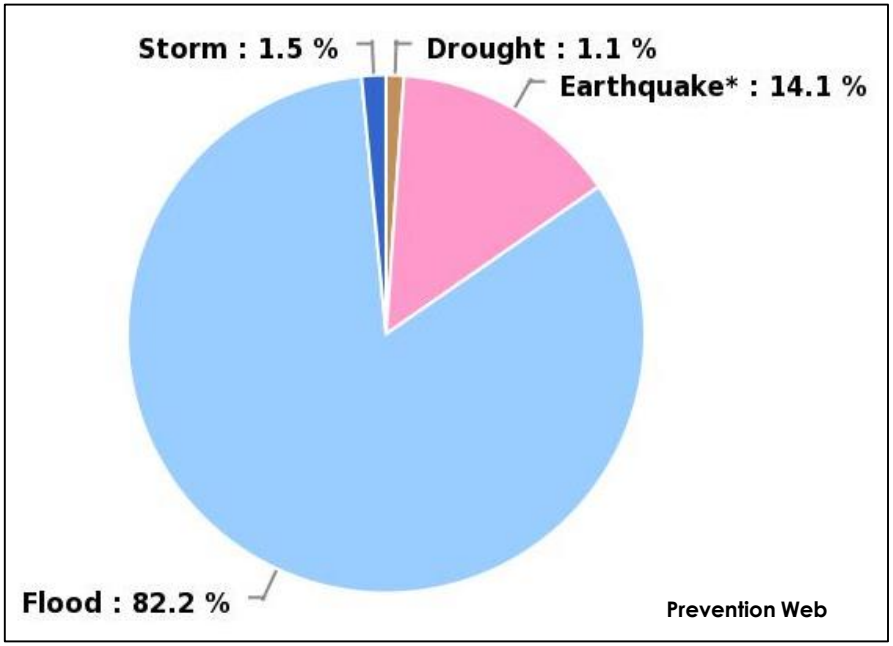
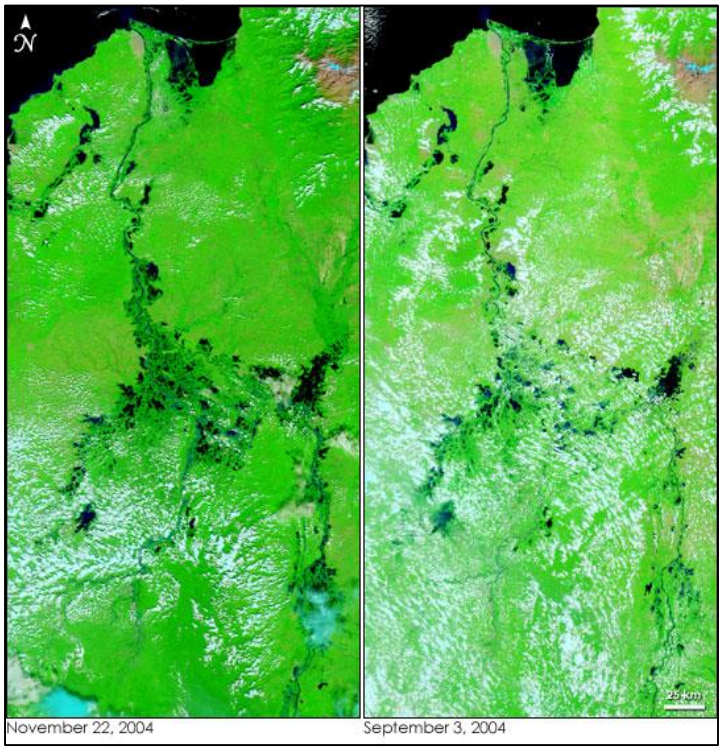
Community Concerns

- Mountainous regions are highly vulnerable to flooding
- Flood warnings and weather predictions are sent to users through IDEAM's Mi Pronóstico Web Application

Percentage of Reported People Affected





NASA

Project Partners

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IDEAM

Objective

- Flood Risk Assessment
- Update existing Mi Pronóstico web application to include flood risk analysis and flood warnings

Study Area

La Mosca River Basin

Study Area

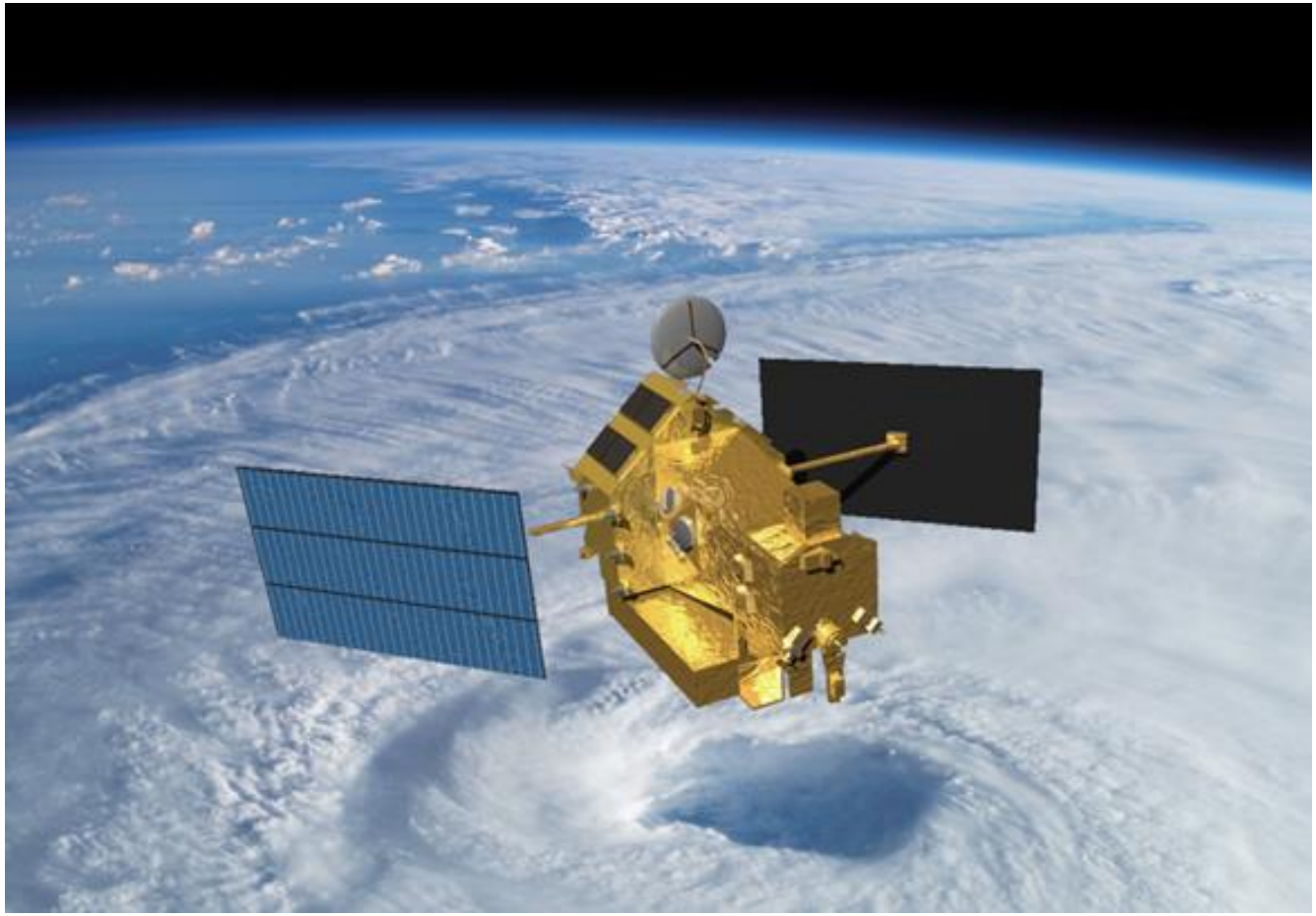
La Mosca River Basin

ASTER

- Advanced Spaceborne Thermal Emission and Reflection Radiometer
  - Terra Satellite
  - Infrared Cameras
  - 30-m grid

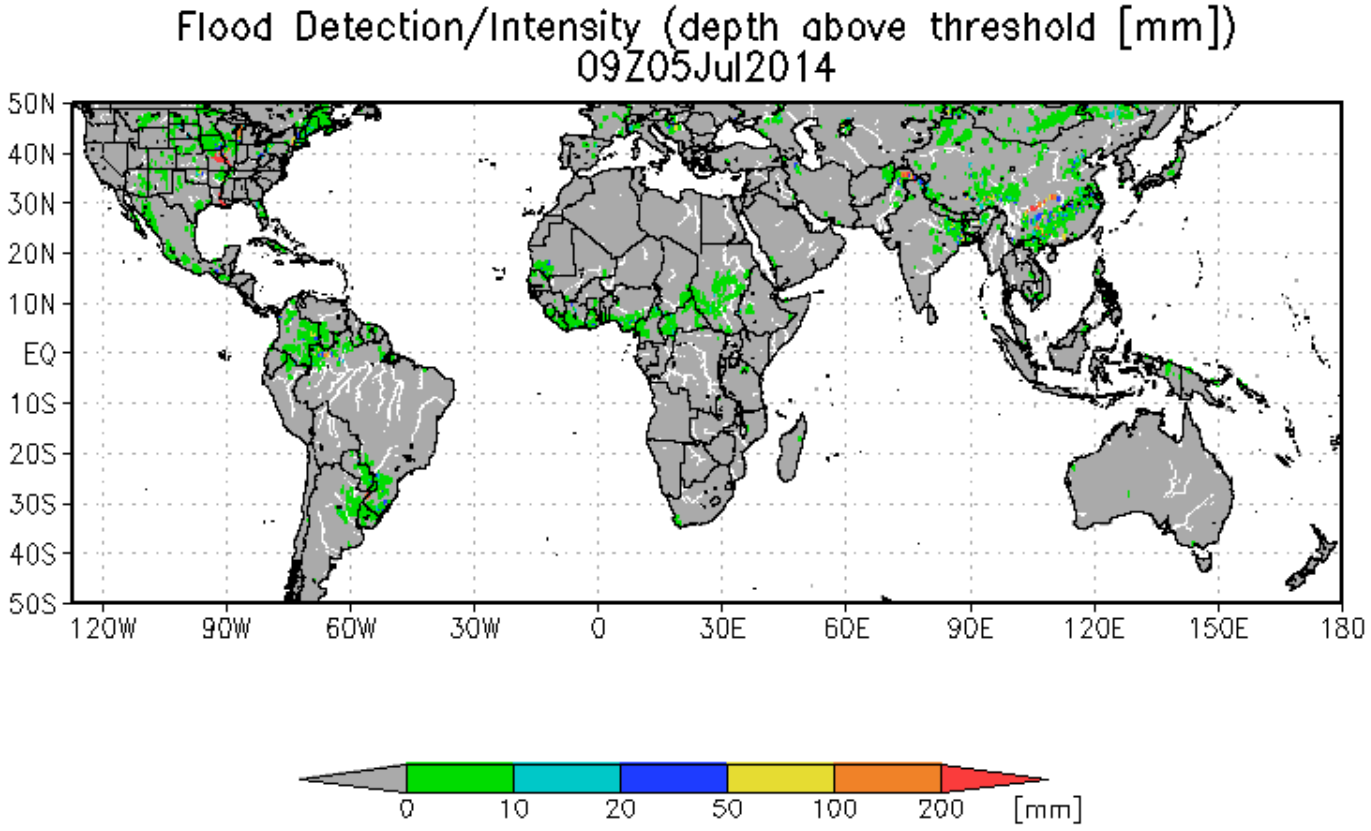
TRMM

- Tropical Rainfall Measuring Mission
  - Near-real-time dataset
  - Precipitation Radar
  - 0.25° grid



Other Data

- Streamflow and precipitation (IDEAM)
- Global Flood Monitoring System and DRIVE model (Dr. Huan Wu, University of Maryland)



Methods

Data

- Slope developed using the ASTER DEM
- Precipitation and streamflow from in situ data

Analysis

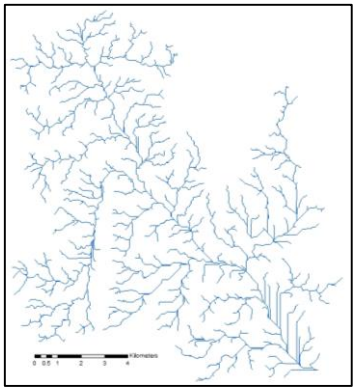
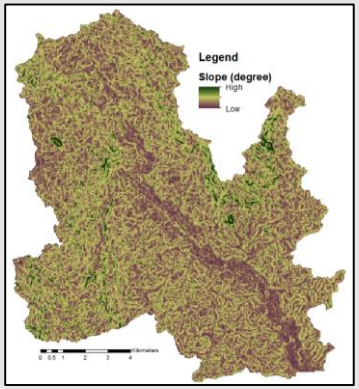
- Calculate watershed area
- Calculate flood indices

Application

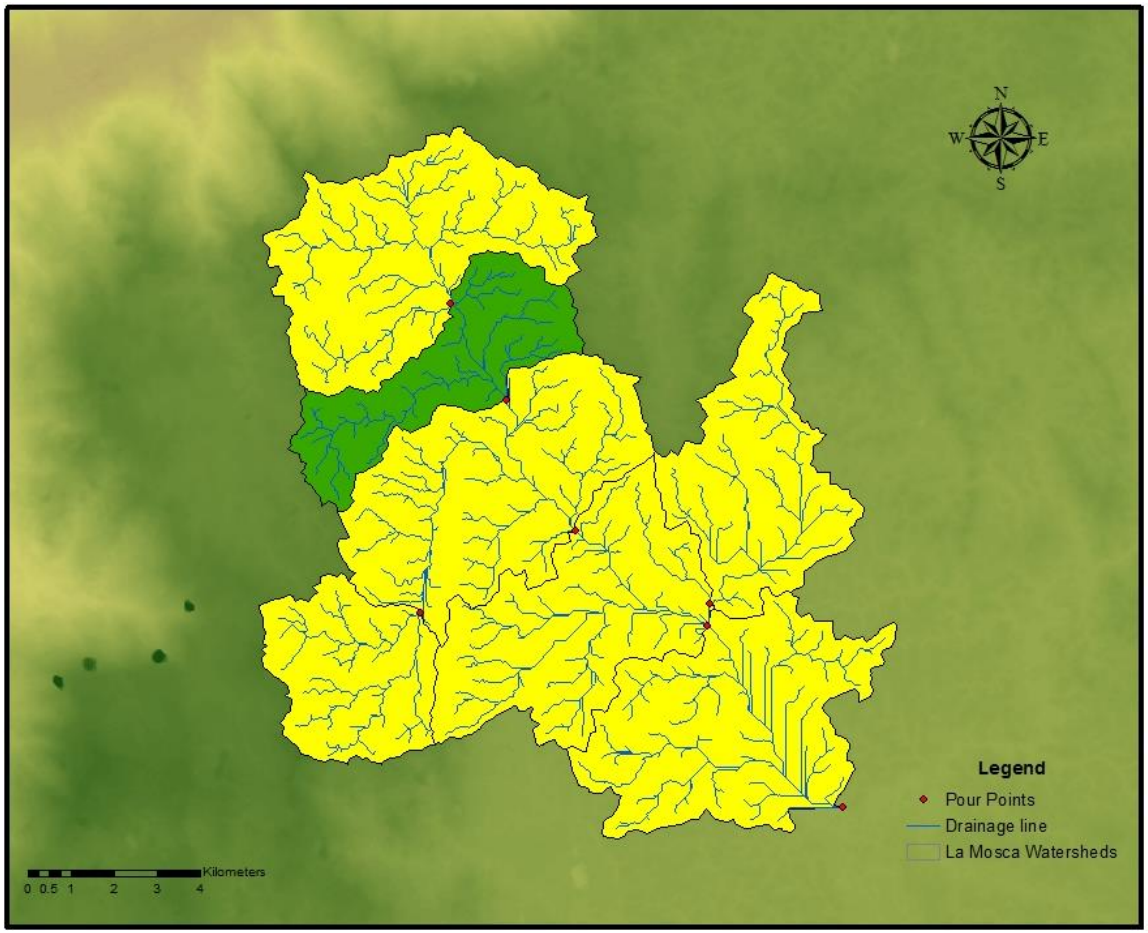
- Flood Risk Map
- Update Mi Pronóstico web application
- Create visualization of flood indices for users in Colombia

Flood Indices:

Morphometric Classification Torrential Index

Drainage Density (km/km^2)	Total length of all streams and rivers in a drainage basin divided by the total area of the drainage basin	
Mean Basin Slope (degree)	Average slope of the drainage basin	
Coefficient of shape	The coefficient of the shape of the drainage basin. Shape values range from round to oval to rectangular	

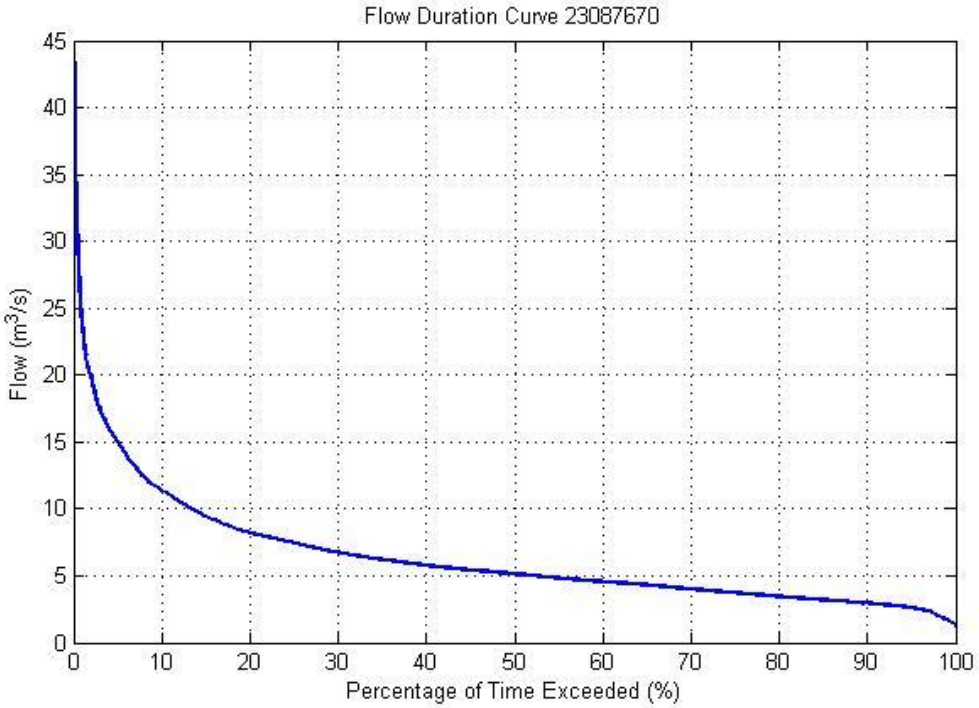
Morphometric Classification
Torrential Index



Drainage Density	Mean Basin Slope 1	2	3	4	5	Coefficient of Shape
1	111	121	131	141	151	1
	112	122	132	142	152	2
	113	123	133	143	153	3
	114	124	134	144	154	4
	115	125	135	145	155	5
2	211	221	231	241	251	1
	212	222	232	242	252	2
	213	223	233	243	253	3
	214	224	234	244	254	4
	215	225	235	245	255	5
3	311	321	331	341	351	1
	312	322	332	342	352	2
	313	323	333	343	353	3
	314	324	334	344	354	4
	315	325	335	345	355	5
4	411	421	431	441	451	1
	412	422	432	442	452	2
	413	423	433	443	453	3
	414	424	434	444	454	4
	415	425	435	445	455	5
5	511	521	531	541	551	1
	512	522	532	542	552	2
	513	523	533	543	553	3
	514	524	534	544	554	4
	515	525	535	545	555	5

Very High
High
Moderate
Low
Very Low

Index of Variability



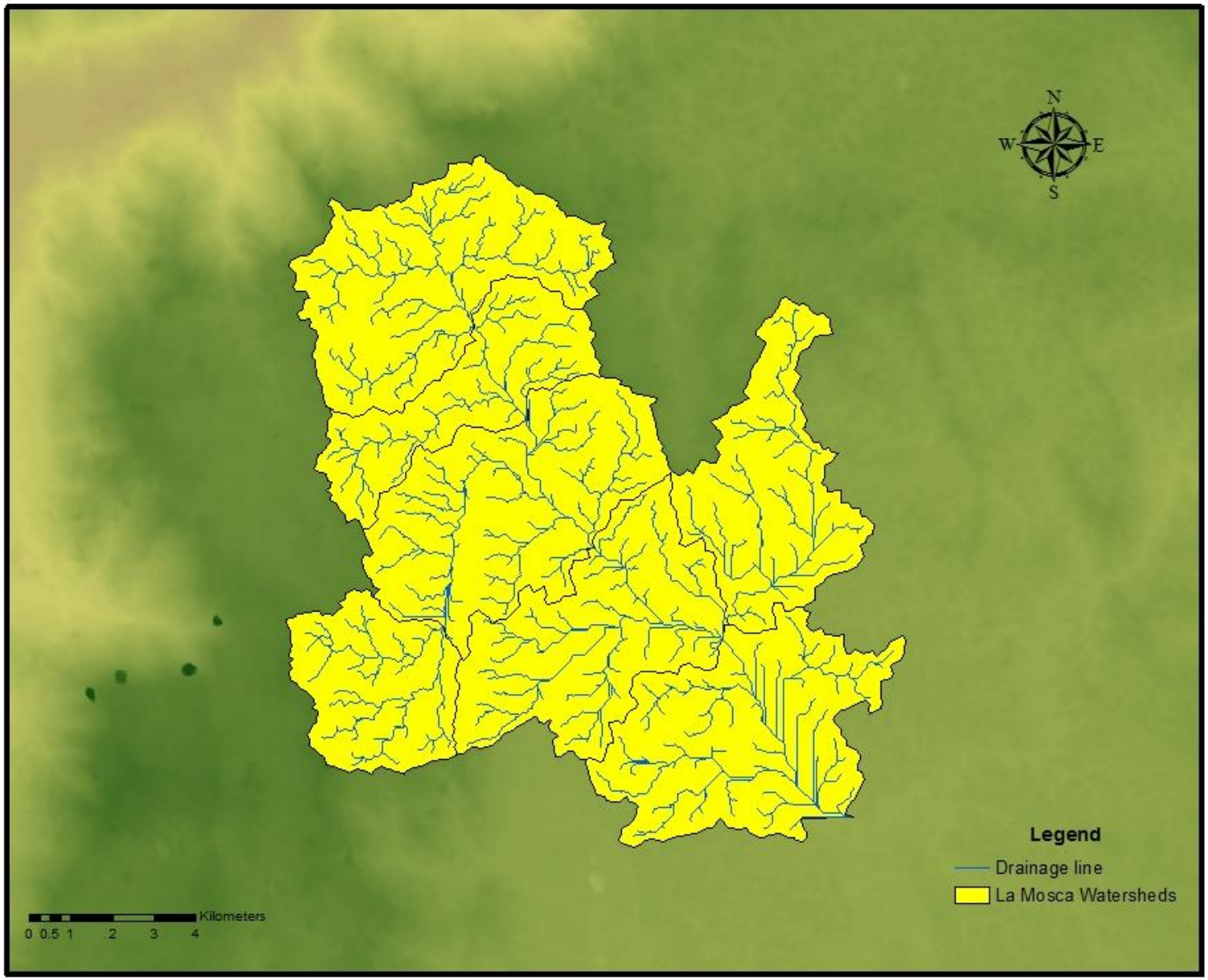
Variability Index	Vulnerability
<10°	Very Low
10.1° - 37°	Low
37.1° - 47°	Average
47.1° - 55°	High
>55°	Very High

Variability Index	Station 23087670	Station 23087860	Station 23087170	Station 23087030
40%-60%	30.2022°	38.9326°	30.4553°	38.2458°
30%-70%	31.7183°	35.2720°	29.2970°	38.0296°
20%-80%	32.0733°	32.8636°	27.3563°	36.2351°
10%-90%	31.5347°	31.0470°	26.5651°	34.7007°

Vulnerability Index for Torrential Events

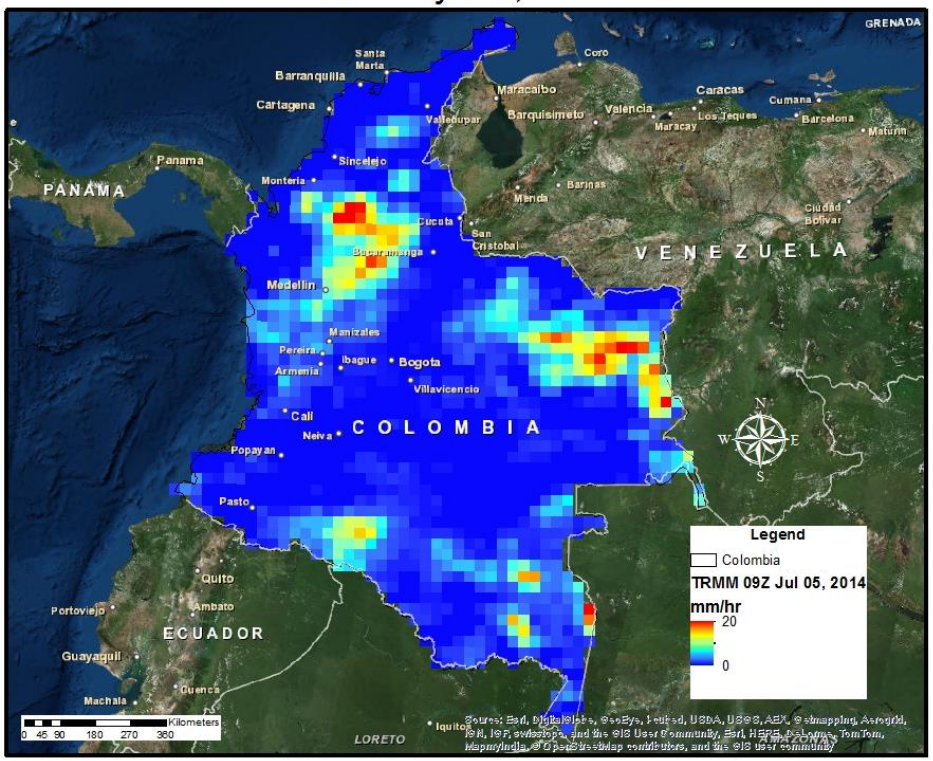
Variability Index	Morphometric Classification Torrential Index				
	Very Low	Low	Medium	High	Very High
Very low	Very Low	Very Low	Medium	High	High
Low	Low	Medium	Medium	High	Very High
Medium	Low	Medium	High	High	Very High
High	Medium	Medium	High	Very High	Very High
Very high	Medium	High	High	Very High	Very High

Vulnerability Index of Torrential Events



TRMM and DRIVE

TRMM Near-Real-Time Precipitaiton
09Z July 05, 2014



DRIVE Model
09Z July 05, 2014
Data Source: Dr. Huan Wu et al., University of Maryland, flood.umd.edu

TRMM and DRIVE

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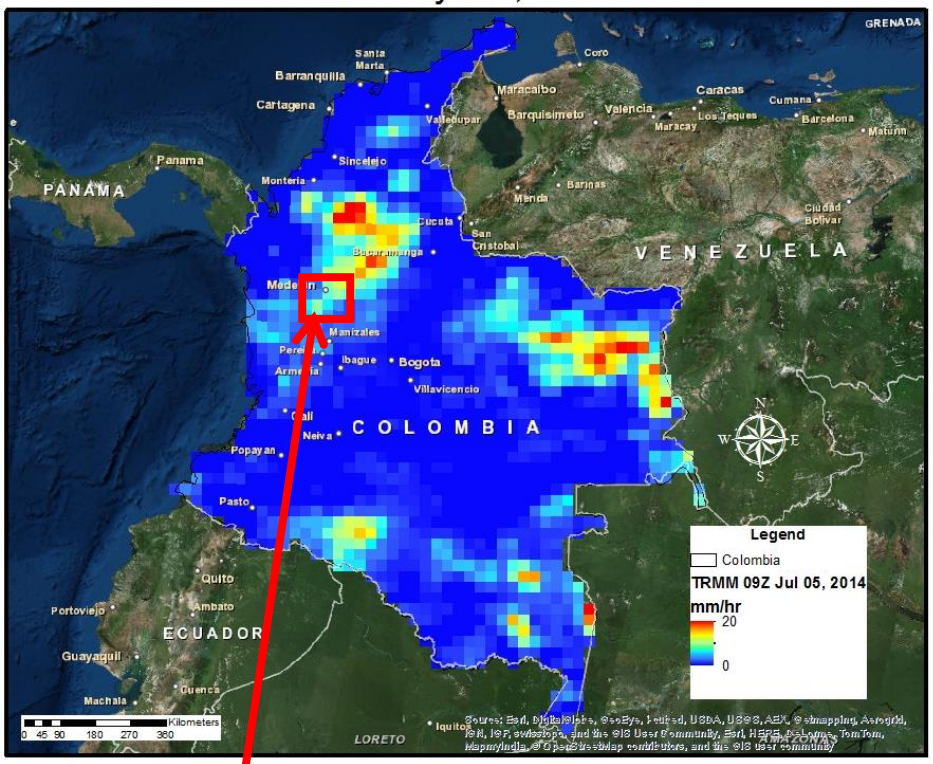

La Mosca
Watershed

DRIVE Model
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Data Source: Dr. Huan Wu et al., University of Maryland, flood.umd.edu

TRMM and DRIVE

TRMM Near-Real-Time Precipitaiton
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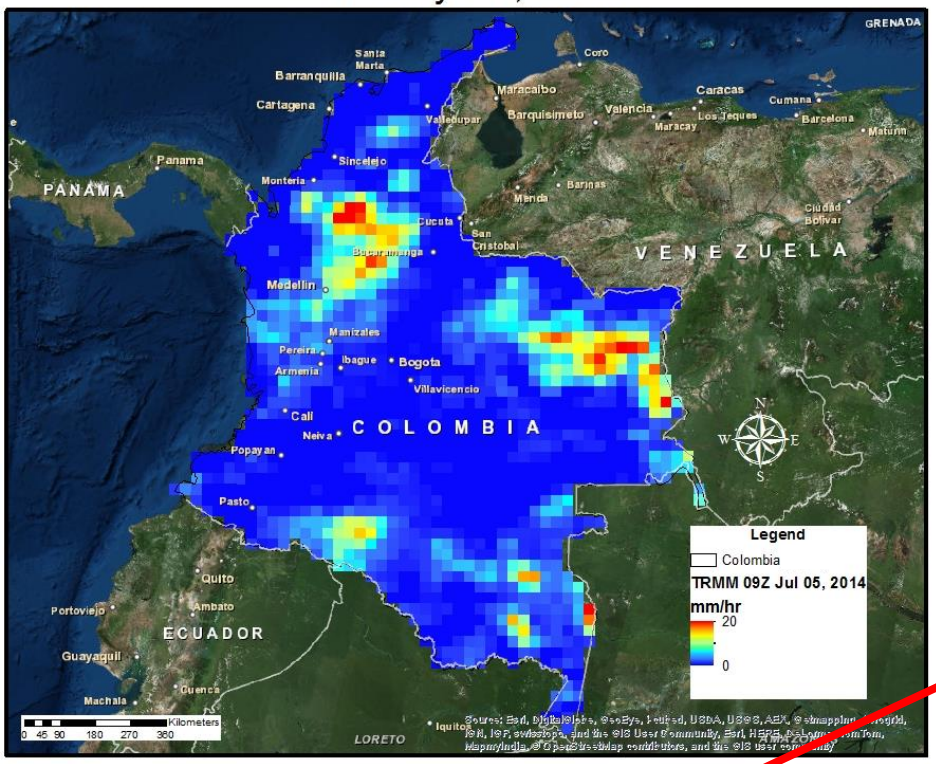

DRIVE Model
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Data Source: Dr. Huan Wu et al., University of Maryland, flood.umd.edu

La Mosca
Watershed

Future Work

- Streamline use of DRIVE and TRMM in the application
- Expand Pilot Study area to watersheds and sub basins across Colombia
- Update the Mi Pronóstico Web and mobile Application

Acknowledgements

Dr. Kenton Ross

NASA DEVELOP National Science Advisor

Lauren Childs

NASA DEVELOP Operations Lead