Interchange of Atmospheric Moisture among South America Catchment Basins

Dr. Isabel Hoyos
isabel.hoyos@udea.edu.co
Universidad de Antioquia
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Aug 22, 2019

Outline

1. An integrative framework
2. Atmospheric features
3. Quantifying atmospheric moisture transference
4. Remarks

1. An integrative framework

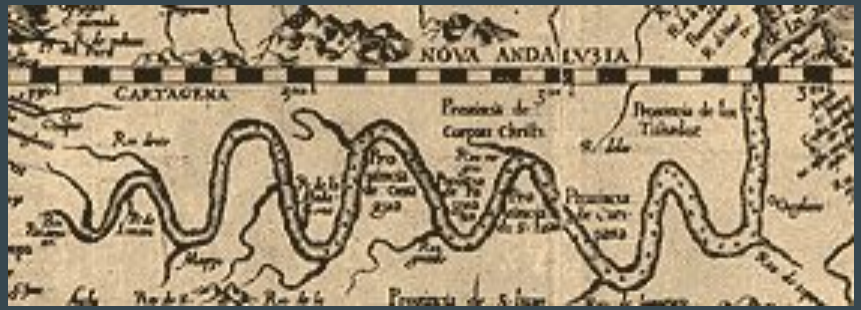


Plate 148
Diego Gutiérrez (1562)

1. An integrative framework

Declaran la Amazonia sujeto de derechos para atacar la deforestación

Este fenómeno creció 44 % en la región entre 2015 y 2016, pasando de 56.952 a 70.074 hectáreas.

Compartir
14 Comentar
Guardar
Reportar
Portada

Declaran la Amazonia su
la deforestación

Este fenómeno creció 44 % en la región entre 2015 y 2016, p

Compartir
14 Comentar
Guardar
Reportar
Portada

EL ESPECTADOR Martes 20 De Agosto

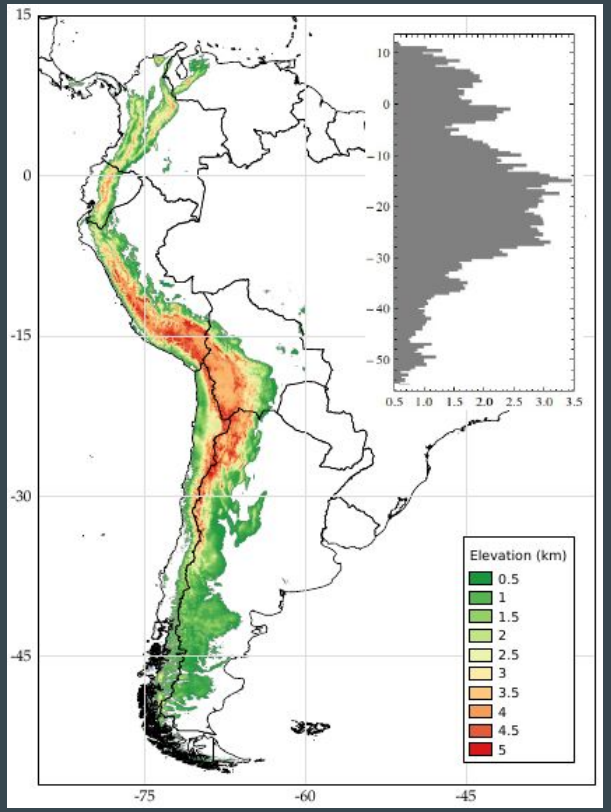
La deforestación se duplicó en el Amazonas

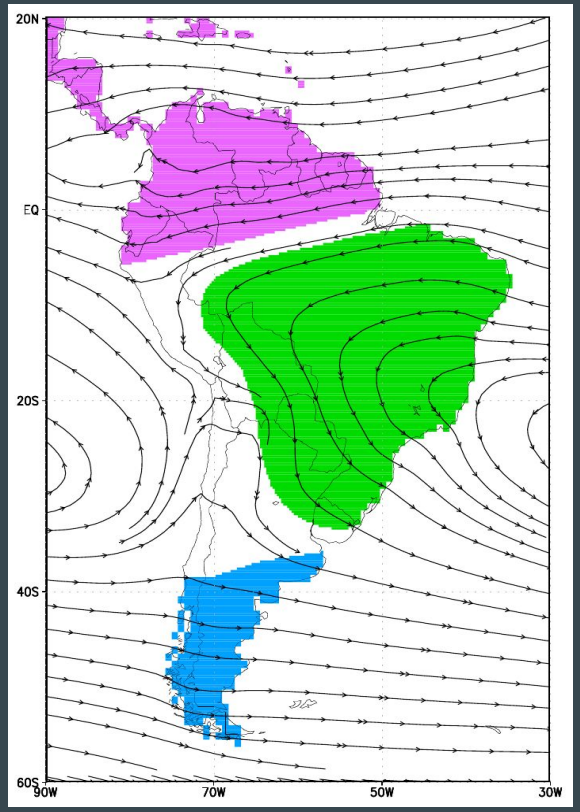
Medio Ambiente 14 Jun 2018 - 9:00 PM
Por: María Mónica Monsalve S. / @mariamonic91

Mientras en 2016 se deforestaron 70.074 hectáreas de selva amazónica, en 2017 la cifra aumentó a 144.147 hectáreas. Se esfumó la posibilidad de reducir a cero la tasa neta de deforestación en la Amazonia para el 2020.

Imagen aérea de la trocha que une Calamar con Miraflores y se convertiría en una vía pavimentada. / Cortesía

1. An integrative framework





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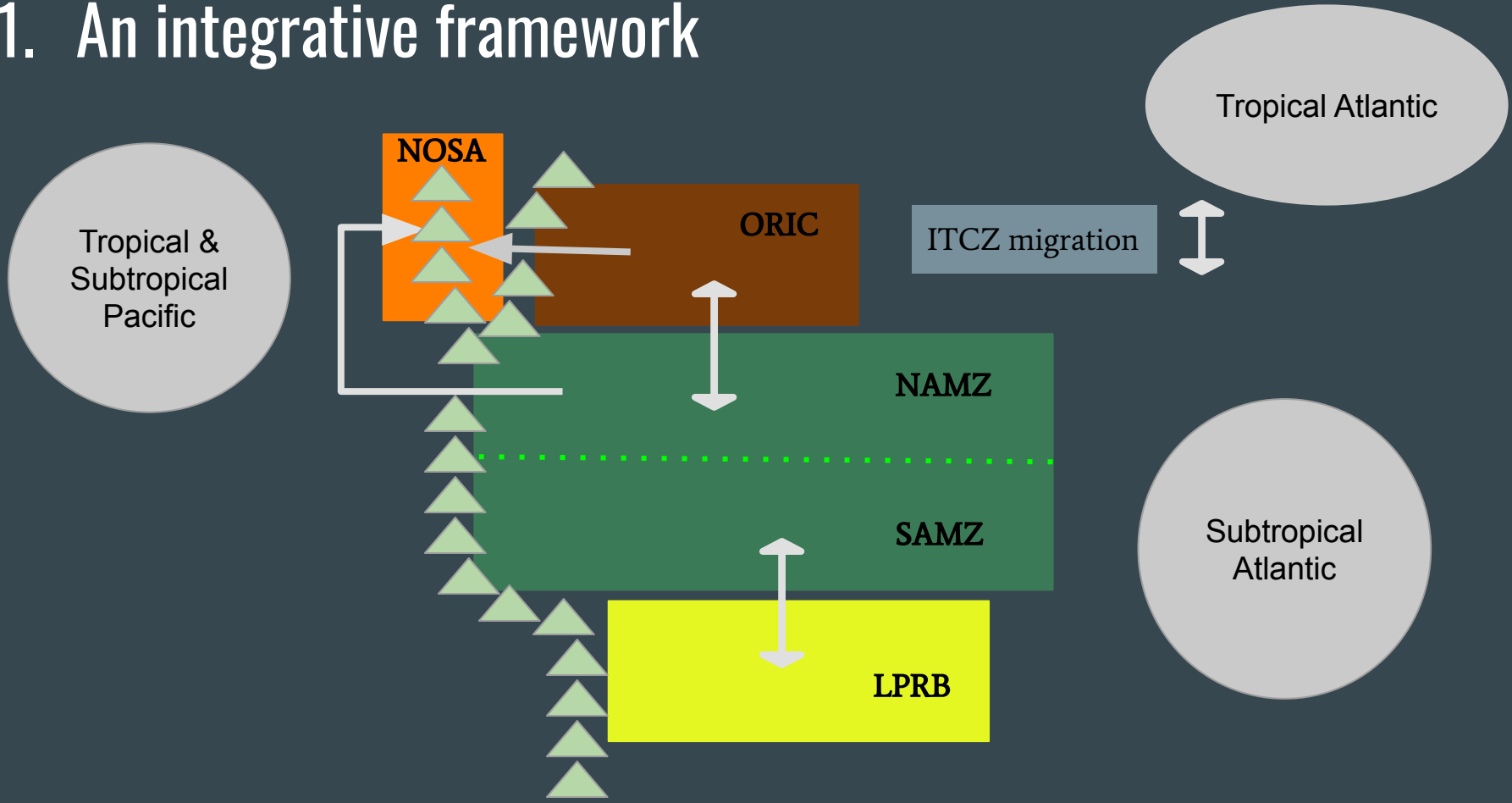


3. Quantifying atmospheric moisture transference

Flexpart - 3D Lagrangian model

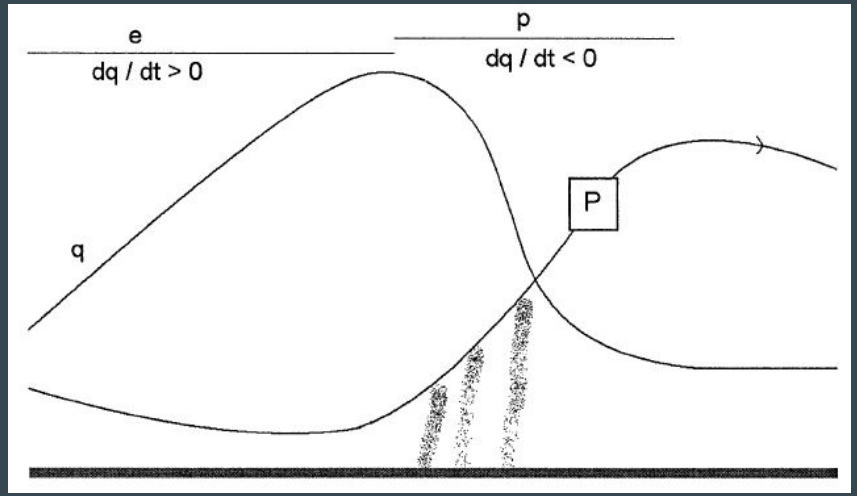
E − P < 0 : moisture loss
E − P > 0 : moisture gain

Forward, optimum day (max 10 d)

ERA- Interim (1980 - 2014; Dee et Al, 2011)

Thanks to:

Environmental | Physics | Laboratory
EPhysLab



Stohl and James (2004)

3. Quantifying atmospheric moisture transference

The 10-day is the traditional estimate for the global mean residence time.

Gimeno et Al., 2010.
Gimeno et Al., 2013.
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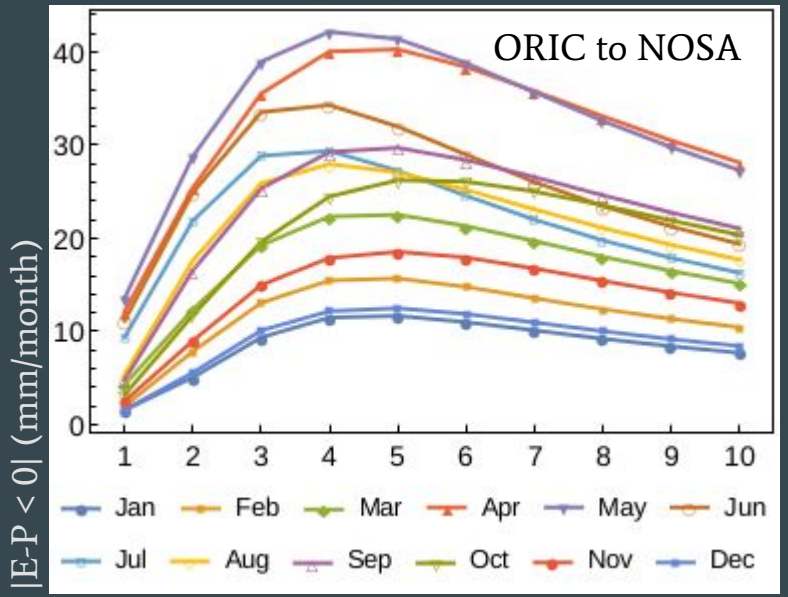

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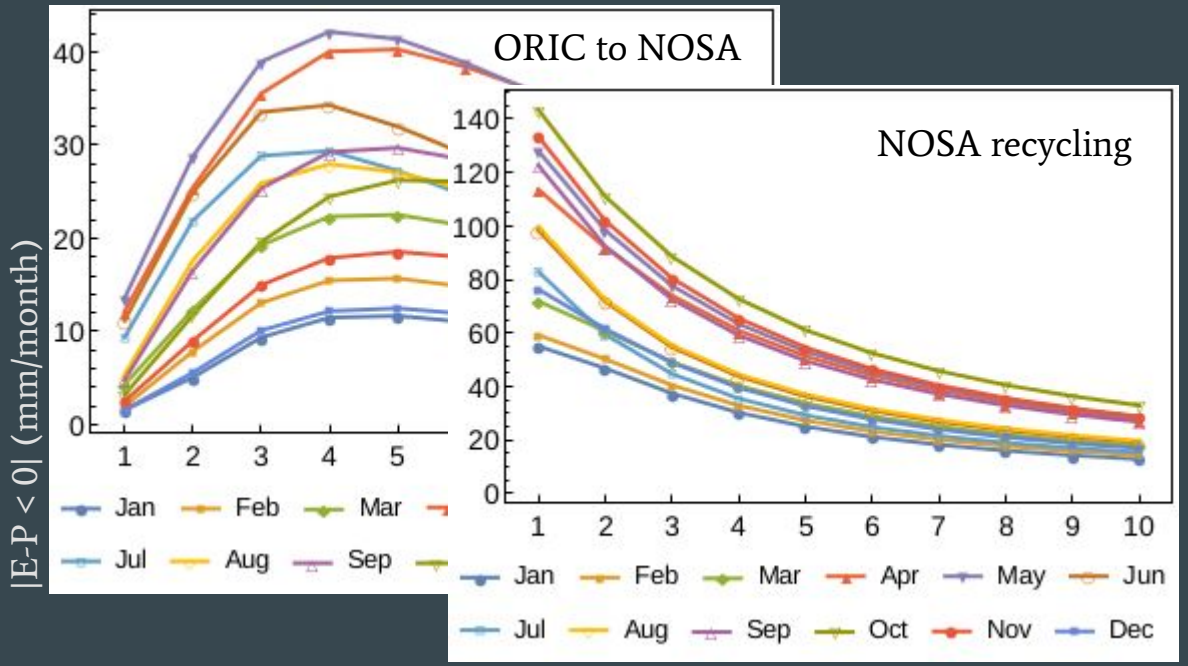

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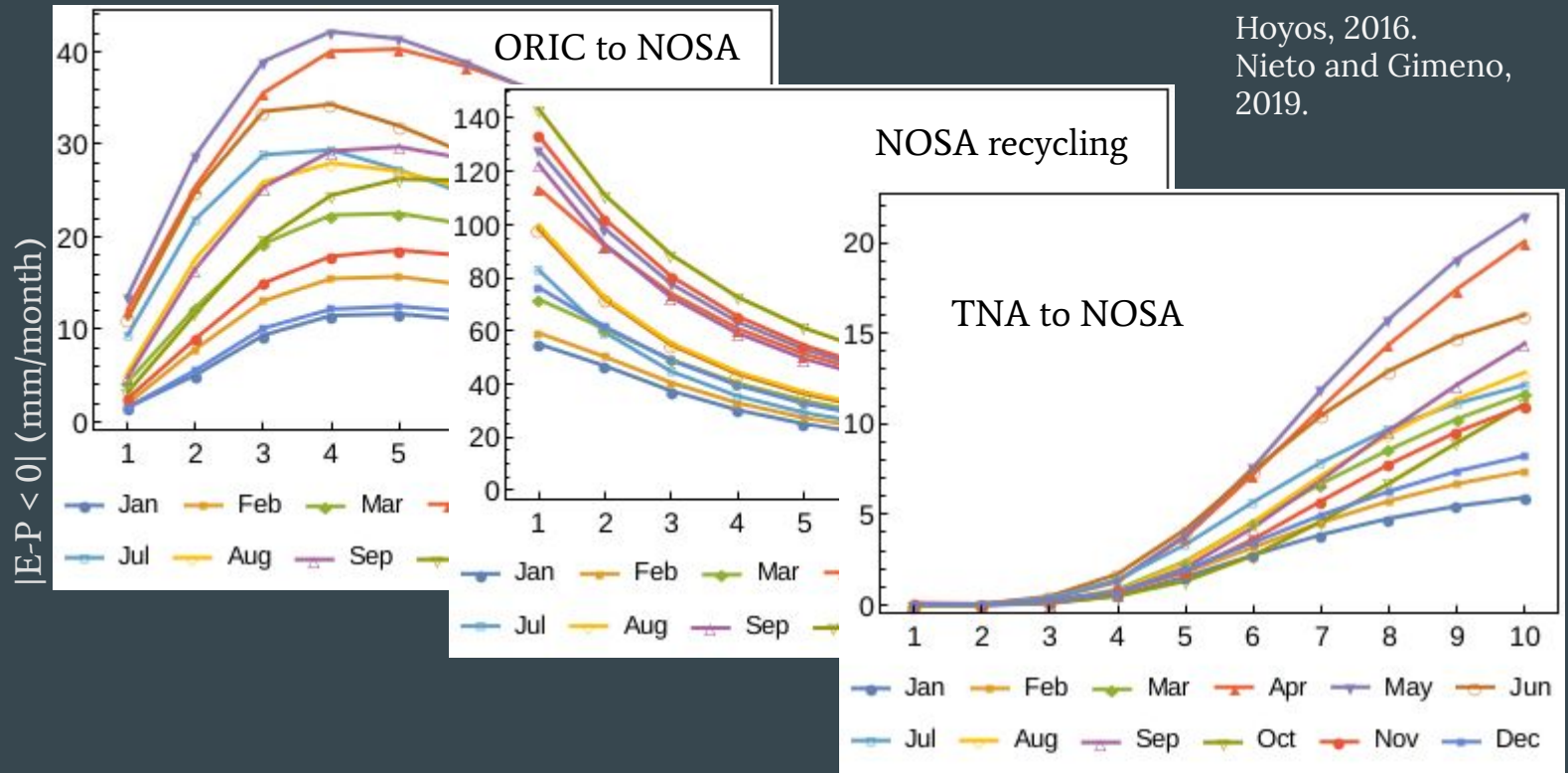
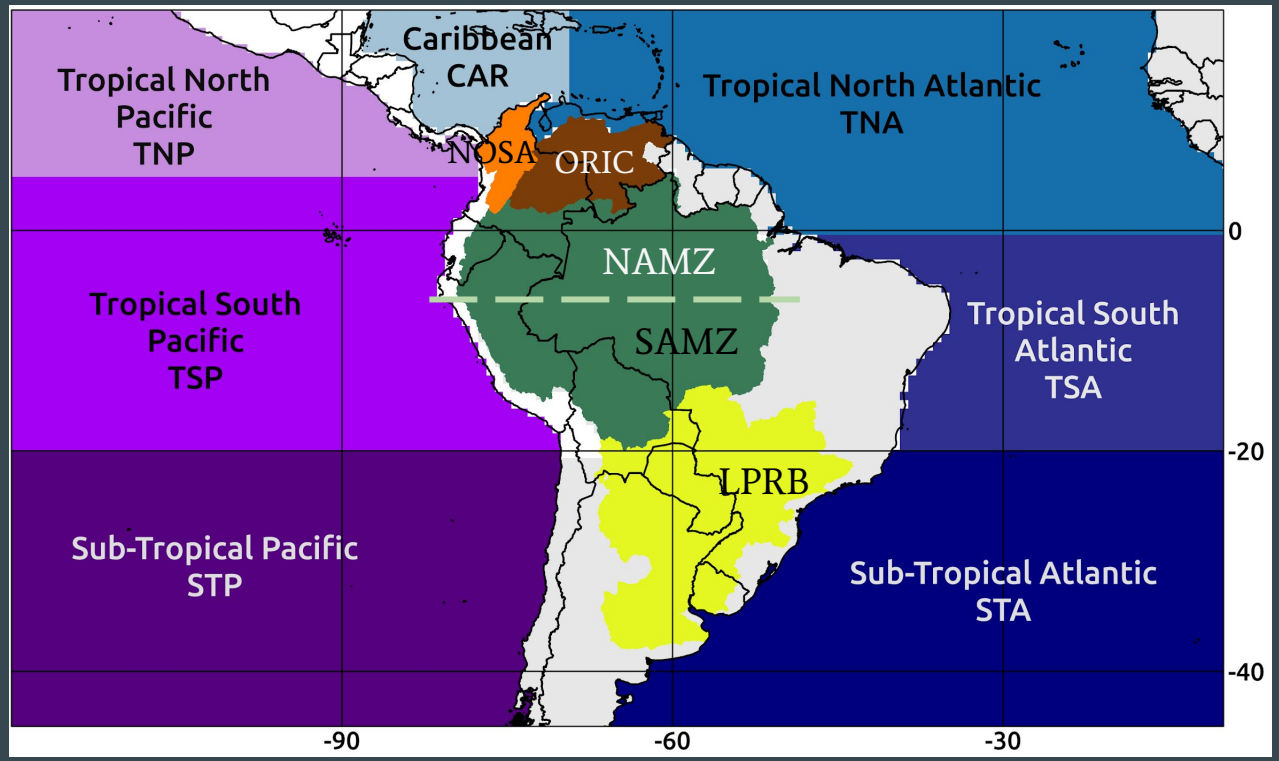


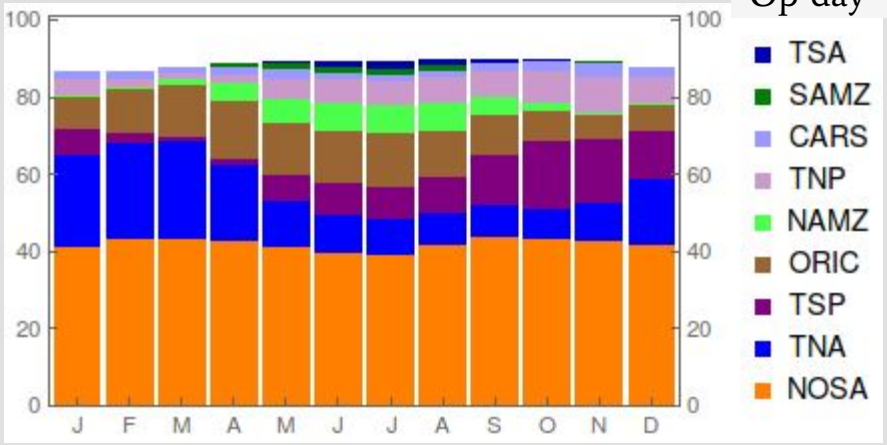
Hoyos, 2016.
Nieto and Gimeno, 2019.

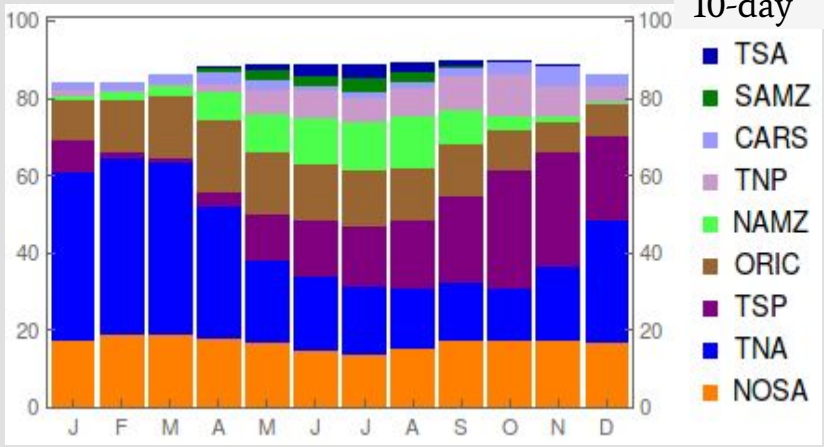
3. Quantifying atmospheric moisture transference



Regional Sources of Moisture

3. Quantifying atmospheric moisture transference (%)



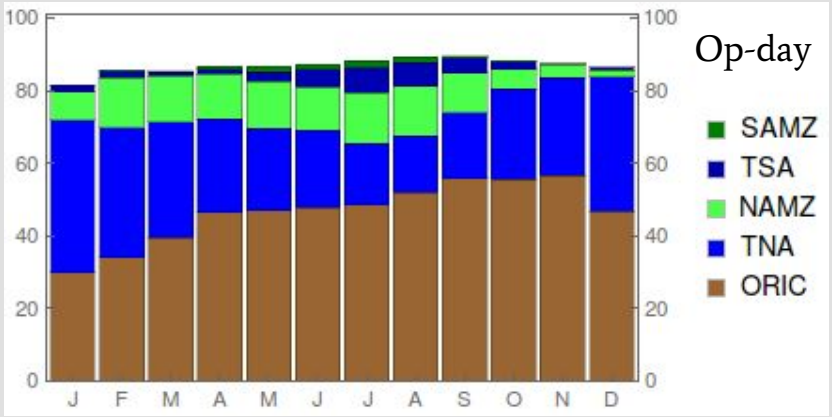


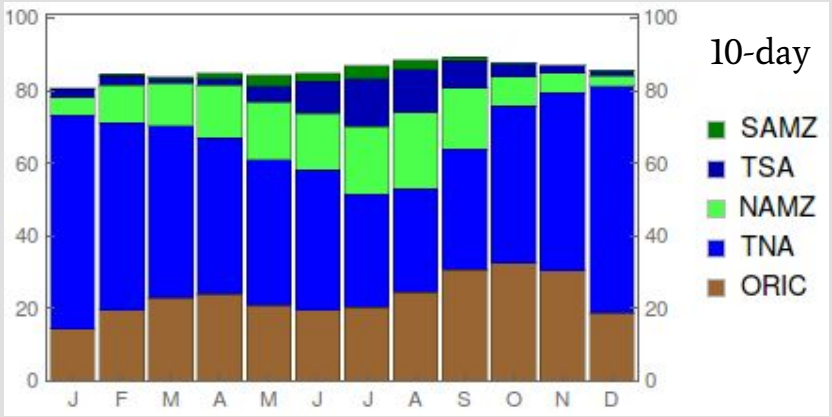
Hoyos et Al., 2017; 2018

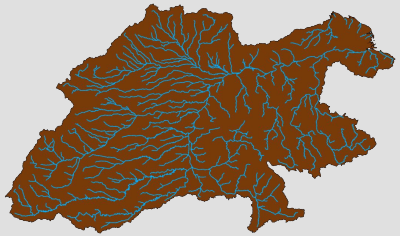
	NOSA	TNA	TSP	ORIC	NAMZ	TNP	CARS	SAMZ	TSA
Op-day	46.51	14.83	10.59	12.16	4.37	6.54	2.44	0.73	0.73
10-day	16.72	24.18	16.52	13.13	6.75	5.91	2.60	1.20	1.18

Magdalena (NOSA)

3. Quantifying atmospheric moisture transference (%)



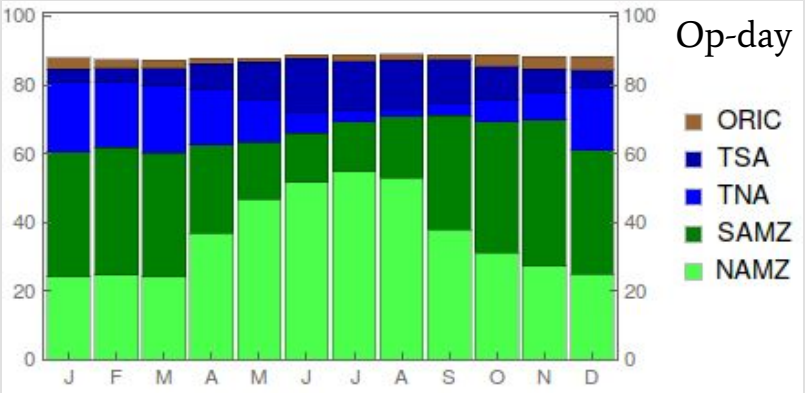


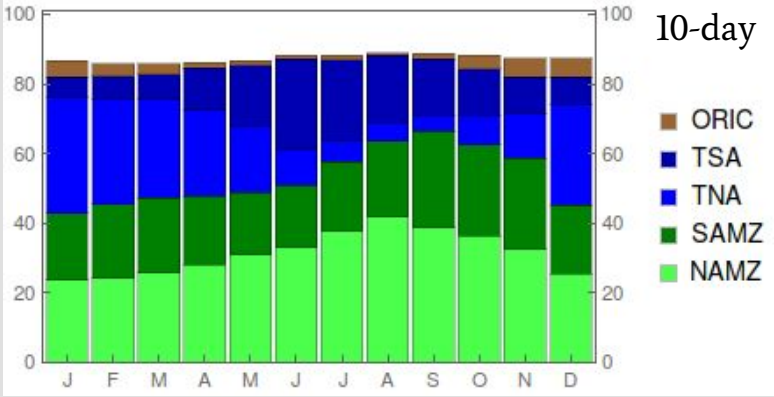


Orinoco (ORIC)

	ORIC	TNA	NAMZ	TSA	SAMZ
Op-day	54.24	25.01	12.72	3.99	1.19
10-day	23.33	39.72	14.53	6.45	1.89

3. Quantifying atmospheric moisture transference (%)

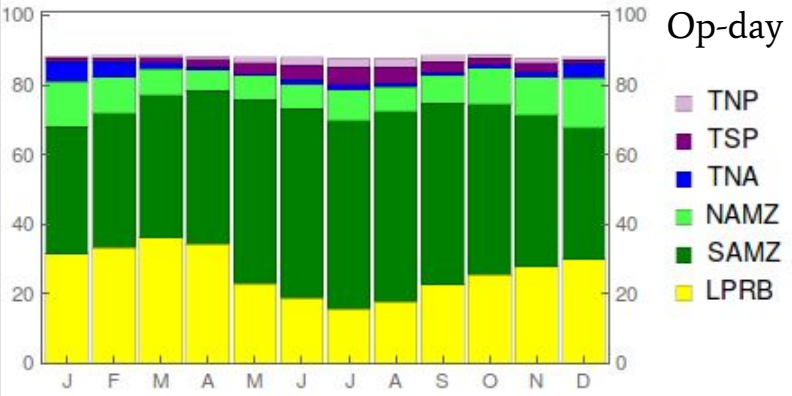


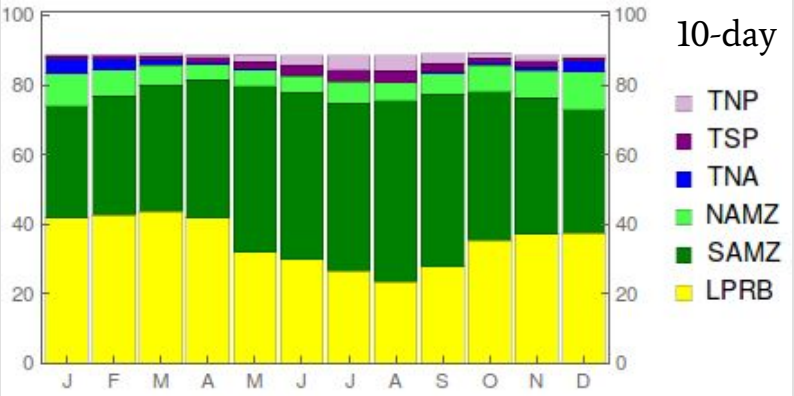


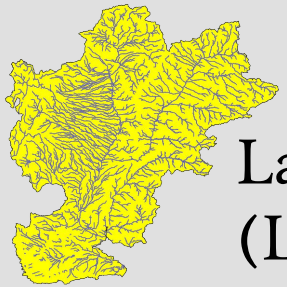
	NAMZ	SAMZ	ORIC	TSA	TNA
Op-day	35.75	35.04	2.81	11.07	5.86
10-day	28.94	21.24	3.22	15.45	8.13

Amazonas

3. Quantifying atmospheric moisture transference (%)







La Plata (LPRB)

	LPRB	SAMZ	NAMZ	TNA	TSA	TSP	TNP
Op-day	28.28	44.07	10.00	2.53	1.3	2.16	1.11
10-day	36.91	39.78	7.29	1.75	0.95	1.57	1.35

4. Remarks

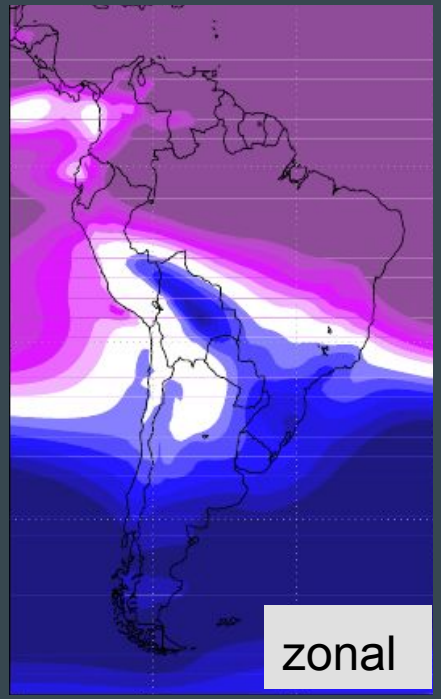
We have the picture of how South American Catchments are linked through the interchange of atmospheric moisture. However, different integration time leads to different moisture source contributions.

Amazon basin is a common source of moisture in the South American Catchments.

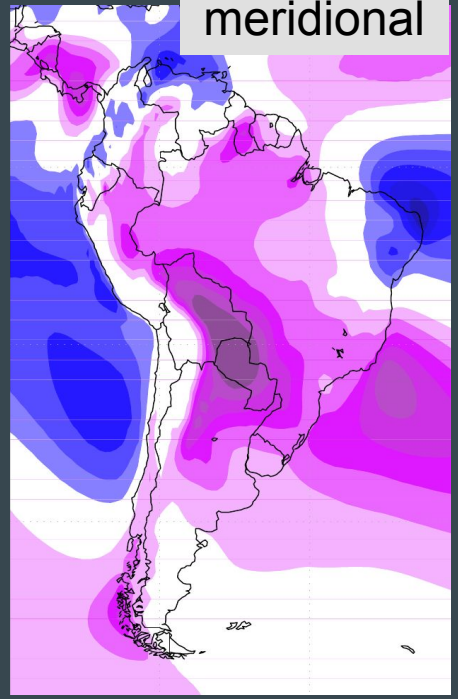
Further work: extend the integration time for the Atlantic sources in order to well capture the Op-day beyond the classical 10-day.

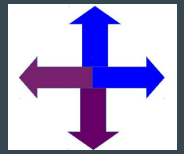
2. Atmospheric features

ERA-Interim



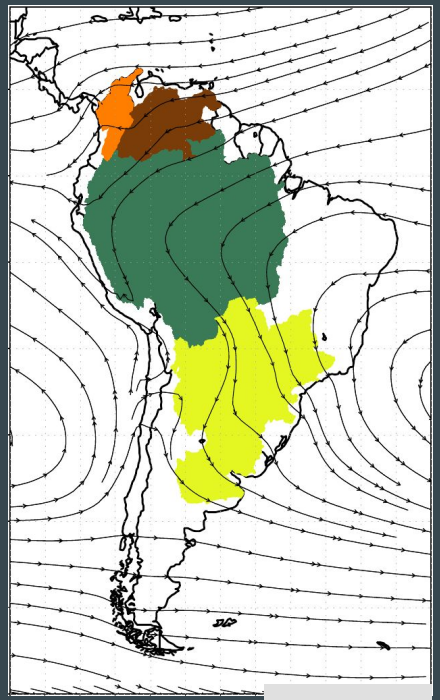
meridional



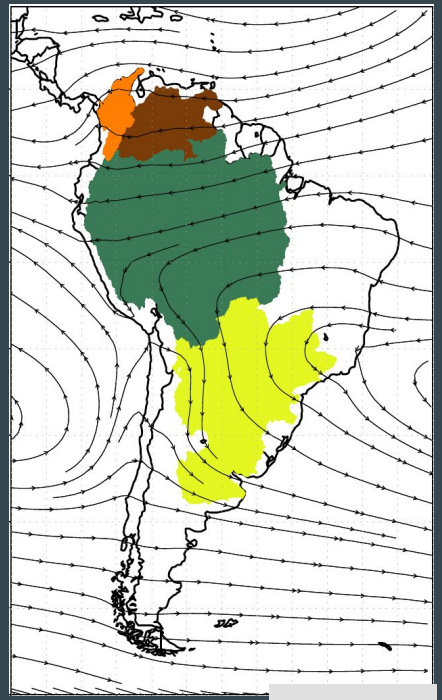


WVF
(kg m^{-1} s^{-1})

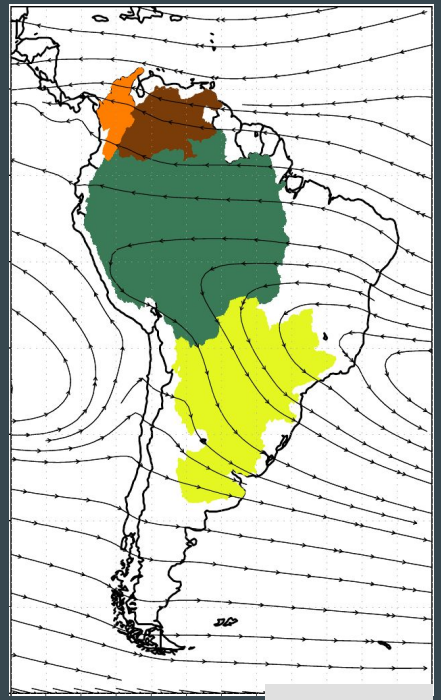
2. Atmospheric features: wvf



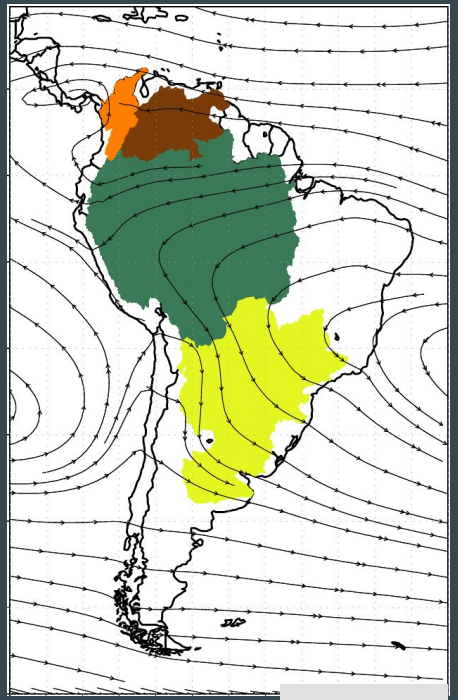
DJF



MAM



JJA



SON