

CLIMATE RESILIENCE APPLIED IN HTS

GLORIA LEÓN ARISTIZÁBAL – Climate Expert (Canal Clima)
JAIME ARISTIZÁBAL – Geohazards Management (CENIT)

"We must not wait for the future we
want; we can create it right now"
United Nations



1

Climate change is a serious
and growing threat to our
well-being and planet health



CLIMATE
CHANGE

12/11/2022
Santa Ana
Bogotá

Fuente: El Tiempo

25/02/2022
Manizales –
Bogotá Road

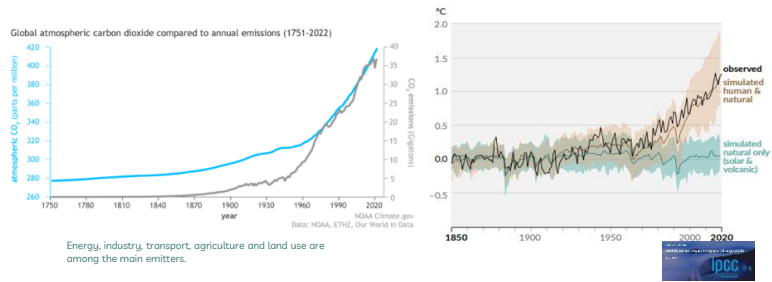


Fuente: CENIT

With global warming of 1.5°C, world
will face multiple unavoidable
climate hazards over the next two
decades

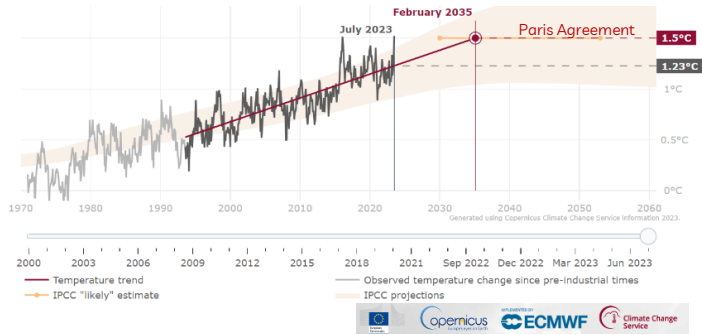
2

CURRENT

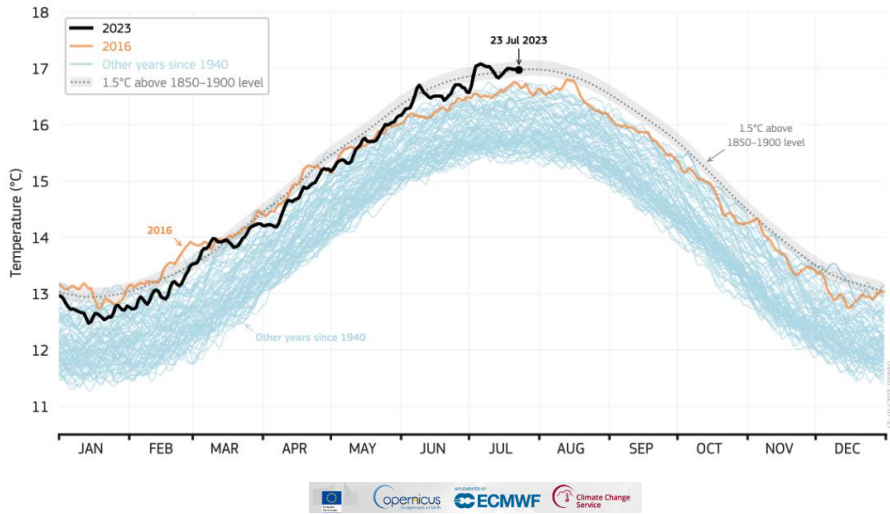


GLOBAL
WARMING

FUTURE



3



GLOBAL
WARMING

4

ISSUE

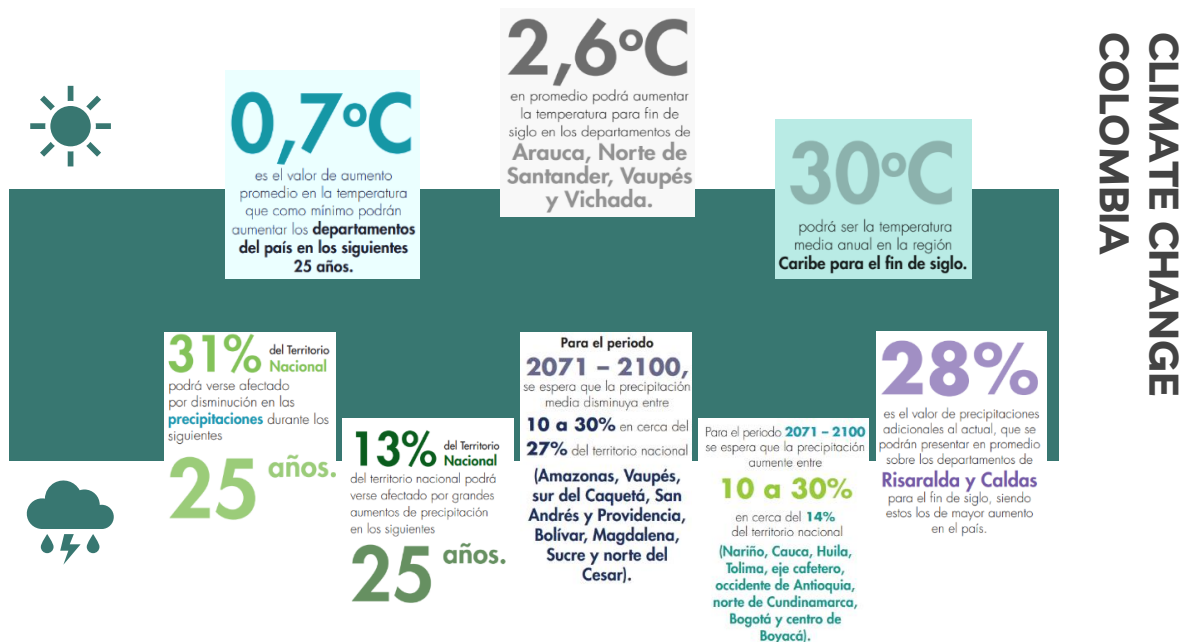
1. A warmer atmosphere contains more moisture.
2. Intensifies the hydrological cycle.
3. Increasing thaw and melting of many frozen parts of the world

EVIDENCE

1. Lag of dry and rainy periods. Increase in frequency and intensity of rainfall.
2. Widespread retreat of glaciers since 1950.
3. Sea level has risen globally by about 20 centimeters since 1900.
4. Increased coastal flooding, snowmelt, catastrophic storms and declining biodiversity

WATER CYCLE CHANGES

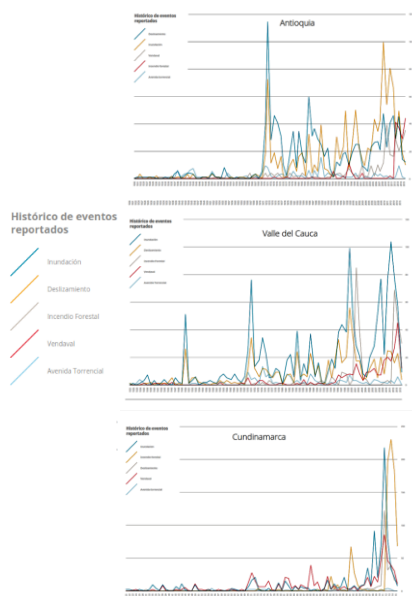
5



Source: Tercera Comunicación Nacional de Cambio Climático – Ideam et al.

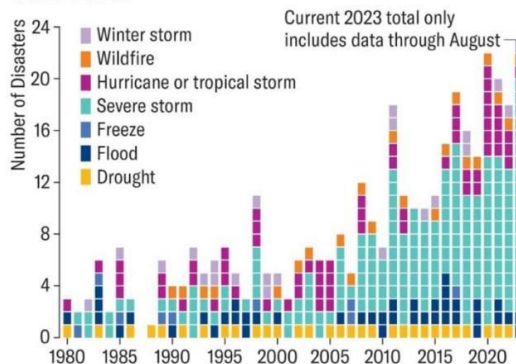
6

EVIDENCE EXTREME EVENTS



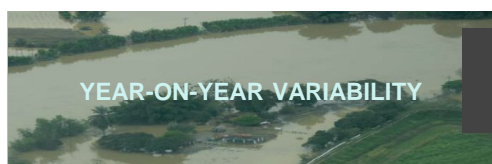
Source: Tercera Comunicación Nacional de Cambio Climático
Ideam et al.

Annual Number of Billion-Dollar Disasters, 1980–2023



Source: Billion-Dollar Weather and Climate Disasters
National Centers for Environmental Information, National Oceanic and Atmospheric Administration (NOAA)
Credit: Amanda Montañez

7



EL NIÑO/LA NIÑA



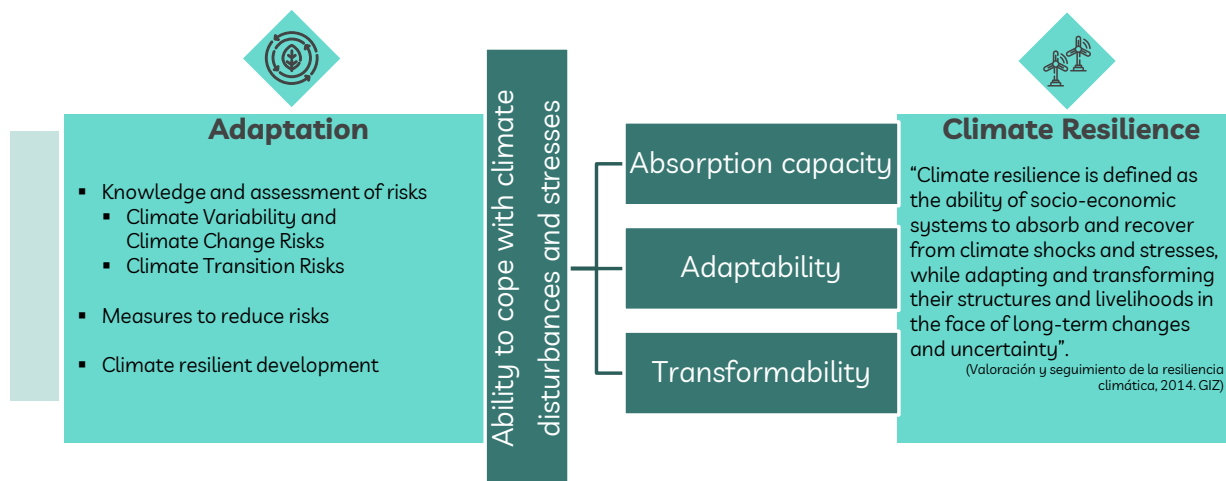
ANNUAL CYCLE



MADEN & JULIAN OSCILATION

CLIMATE VARIABILITY

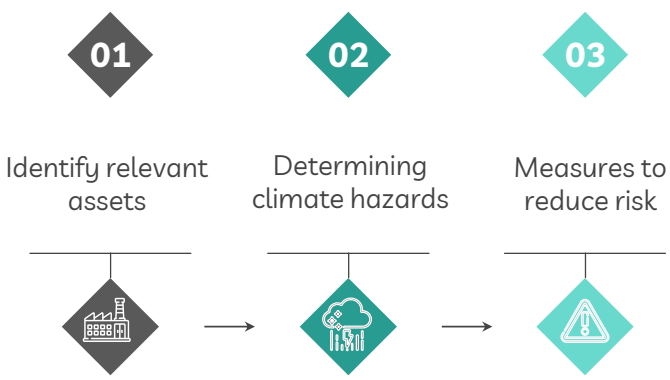
8



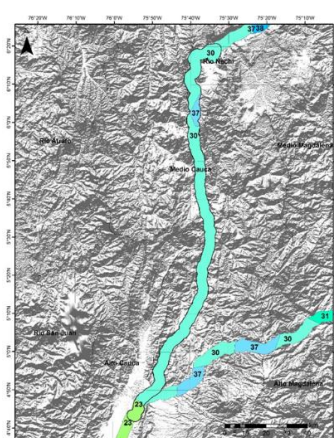
9

CLIMATE RESILIENCE

Ability of
a community, business, or
natural environment
to
prevent, resist, respond to,
and recover
from
weather-related disruption
or extreme weather

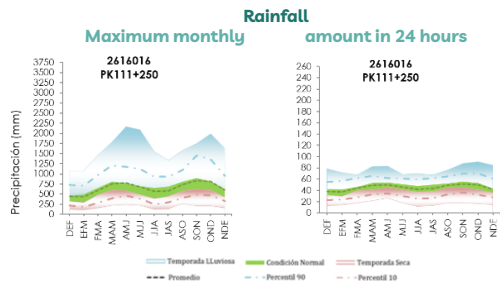


10

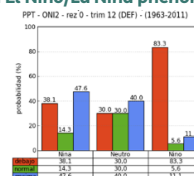
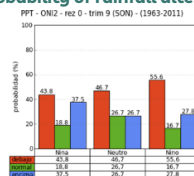


Climite Zoning

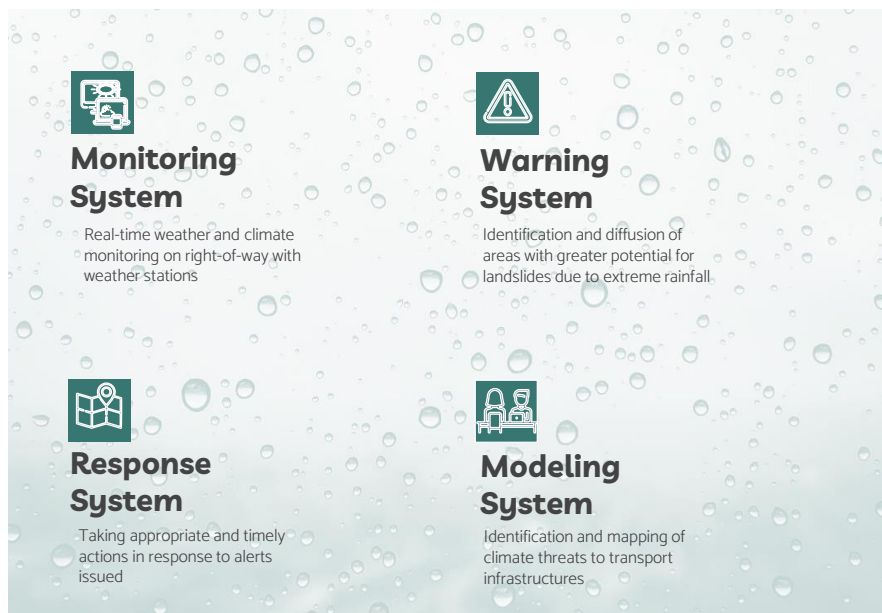
IRLL	Precipitación (mm/día)	IFM	Días con Lluvia (anual)	FLL	PK
23	4	BAJA	180	MODERADA	PK221+000 - PK230+000
30	4	BAJA	229	MODERADA A ALTA	PK0+000 - PK49+000; PK57+000 - PK221+000
37	4	BAJA	277	ALTA	PK49+000 - PK57+000



Probability of rainfall alteration in El Niño/La Niña phenomena



11

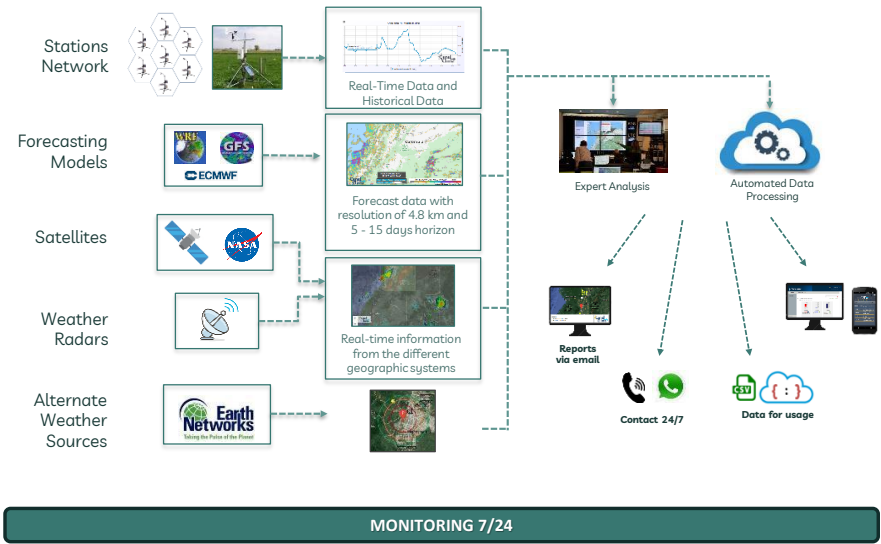


12

RESILIENCE PROGRAM Background

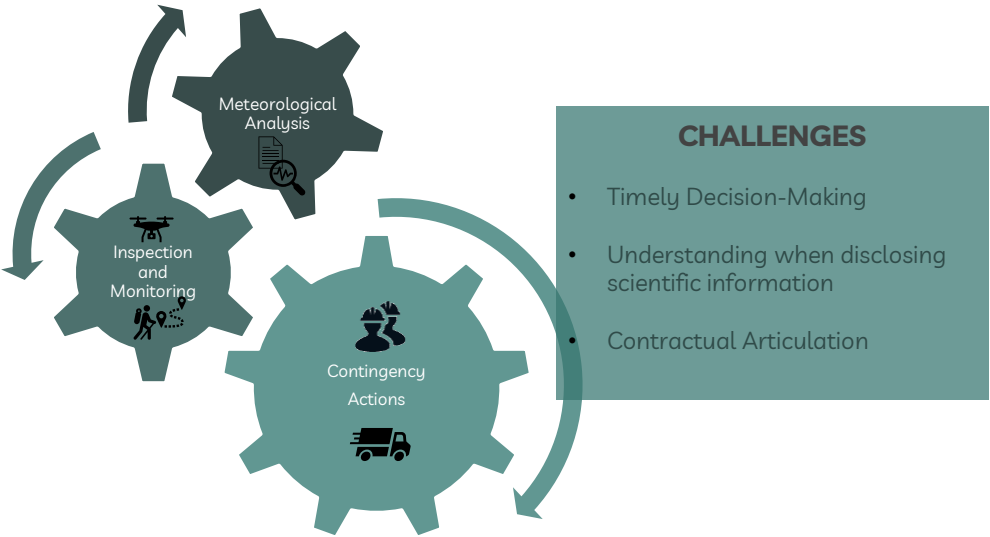
RESILIENCE PROGRAM

RESILIENCE
PROGRAM
Monitoring and Warning



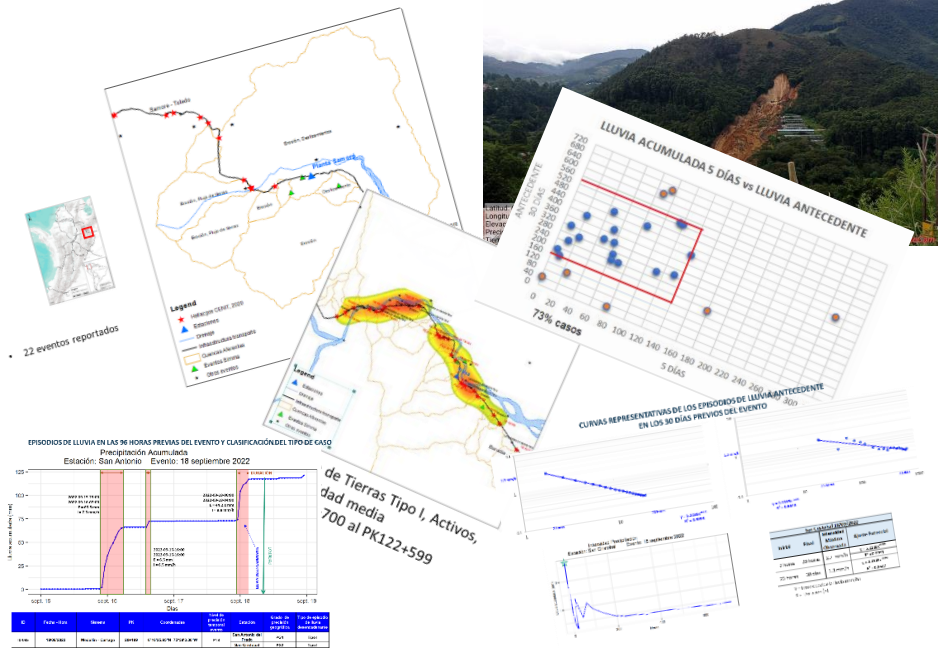
13

RESILIENCE
PROGRAM
Response



14

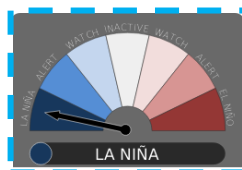
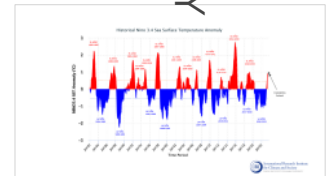
RESILIENCE PROGRAM Modeling



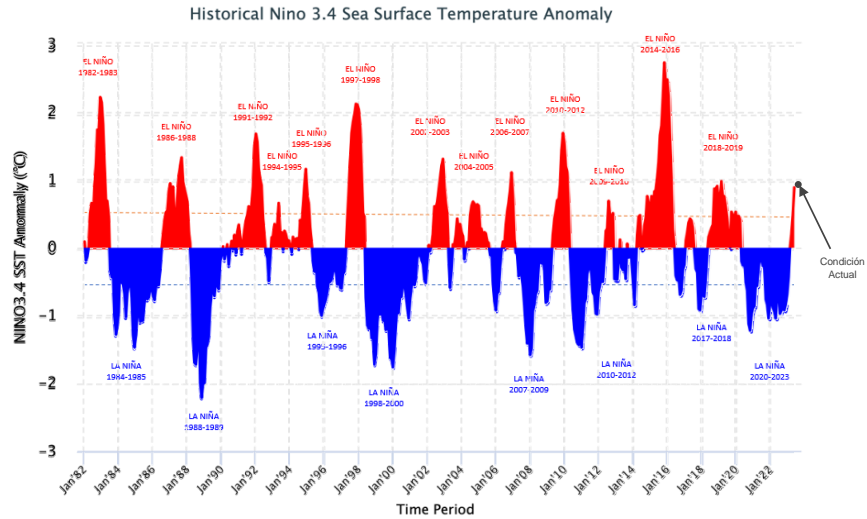
15

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2011	-1.4	-1.2	-0.9	-0.7	-0.6	-0.4	-0.5	-0.6	-0.8	-1.0	-1.1	-1.0
2012	-0.9	-0.7	-0.6	-0.5	-0.3	0.0	0.2	0.4	0.4	0.3	0.1	-0.2
2013	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.5	-0.3	0.0	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.7
2015	0.5	0.5	0.5	0.7	0.9	1.2	1.5	1.9	2.2	2.4	2.6	2.6
2016	2.5	2.1	1.6	0.9	0.4	-0.1	-0.4	-0.5	-0.6	-0.7	-0.7	-0.6
2017	-0.3	-0.2	0.1	0.2	0.3	0.3	0.1	-0.1	-0.4	-0.7	-0.8	-1.0
2018	-0.9	-0.9	-0.7	-0.5	-0.2	0.0	0.1	0.2	0.5	0.8	0.9	0.8
2019	0.7	0.7	0.7	0.7	0.5	0.5	0.3	0.1	0.2	0.3	0.5	0.5
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1					

CLIMATE VARIABILITY

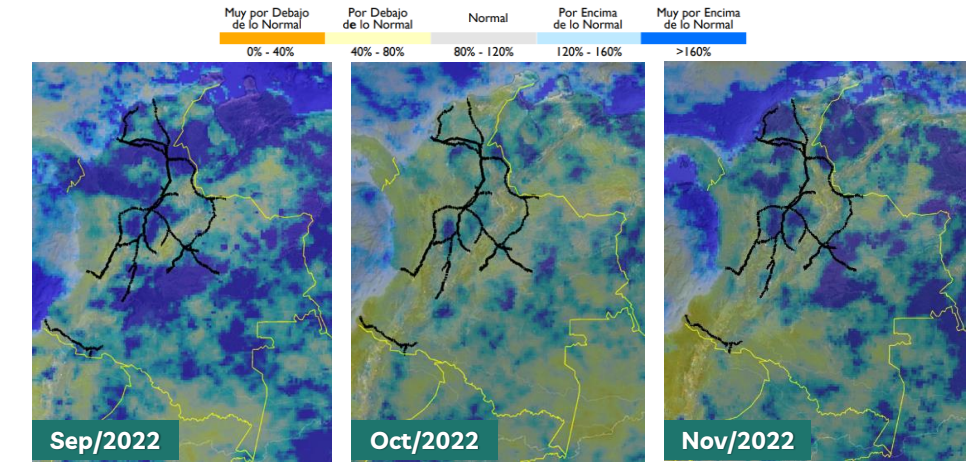


16



International Research Institute
for Climate and Society
EARTH INSTITUTE | COLUMBIA UNIVERSITY

17

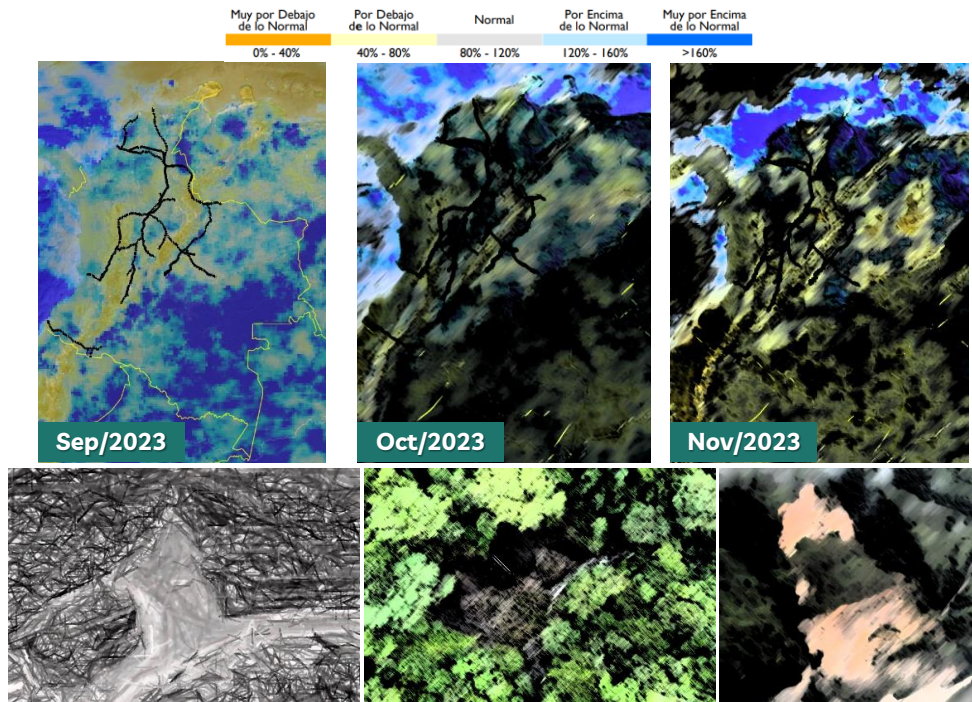


ROW
RESILIENCE
La Niña

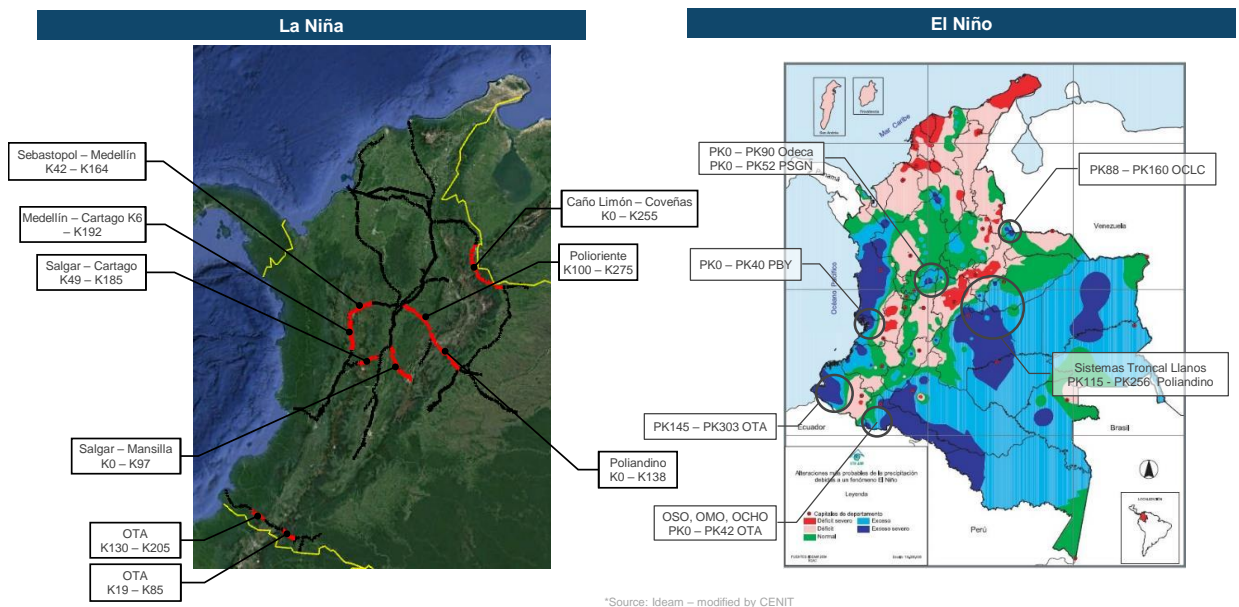


18

ROW RESILIENCE El Niño



19



20

Thank you

