

Evaluación de riesgos ambientales y a la salud humana por metales pesados en sedimentos de escorrentía urbana.

María Alejandra Pimiento



Bogotá - Colombia



<https://commons.wikimedia.org/w/index.php?curid=15453765>

4°45'0"N

4°40'0"N

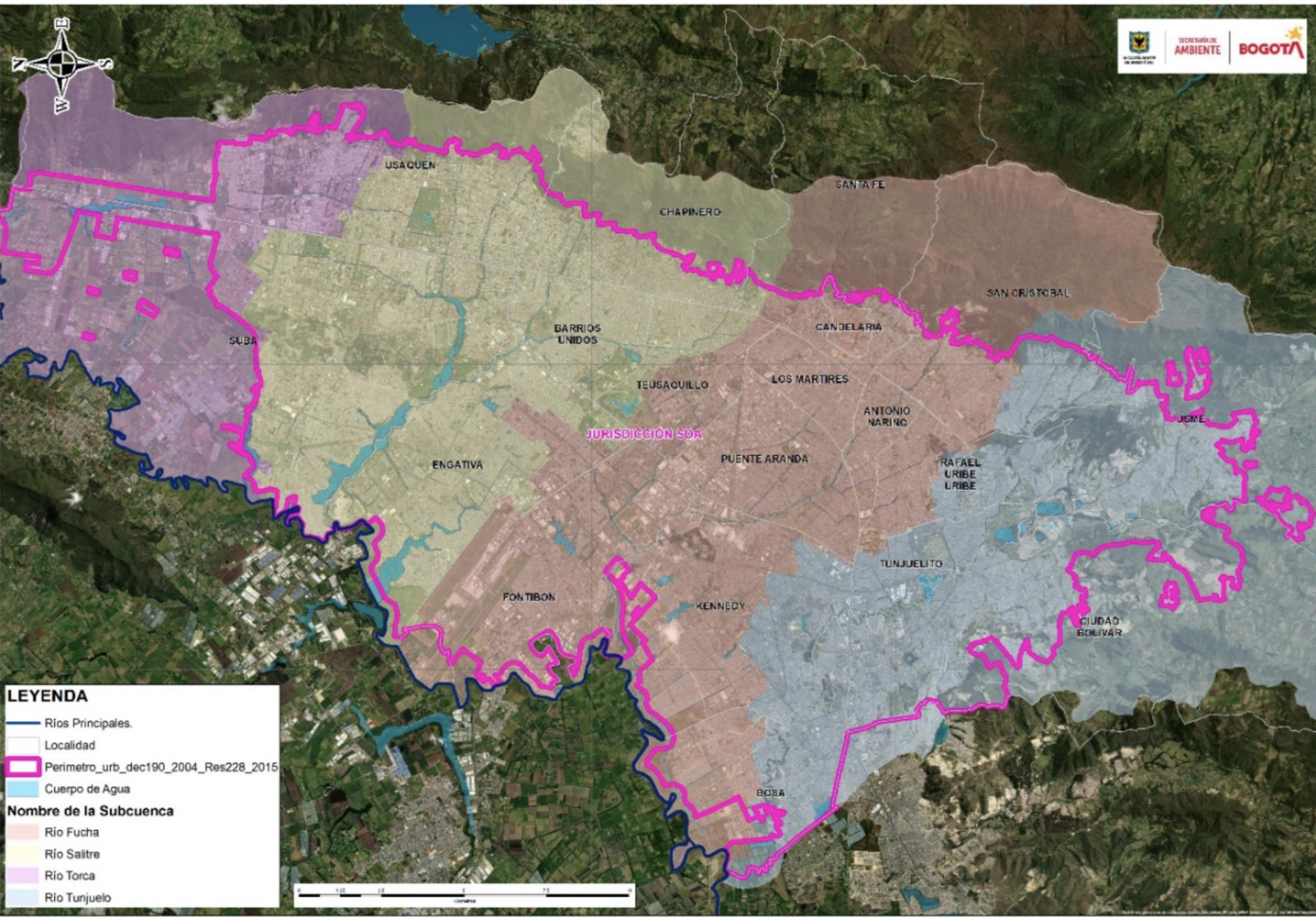
4°35'0"N

4°30'0"N

74°0'0"W

74°5'0"W

74°10'0"W



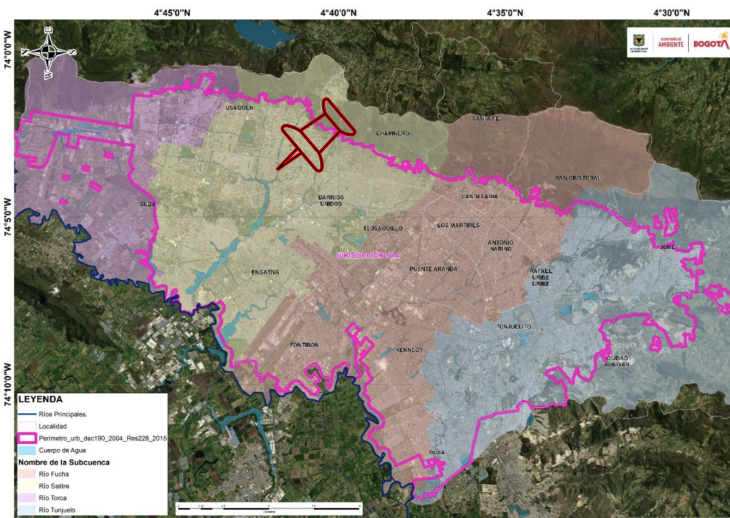
LEYENDA

- Ríos Principales.
- Localidad
- Perimetro_urb_dec190_2004_Res228_2015
- Cuerpo de Agua

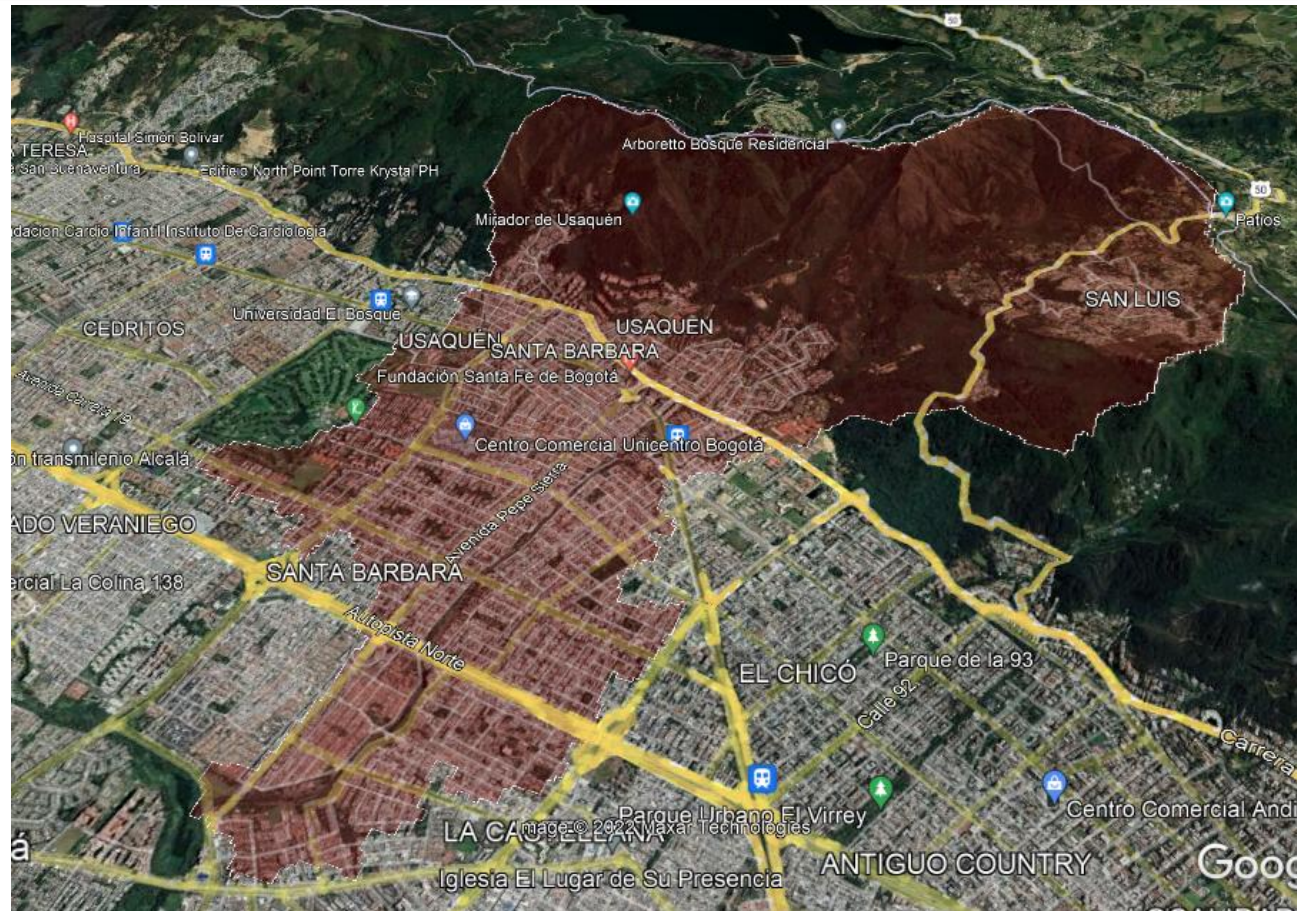
Nombre de la Subcuenca

- Río Fucha
- Río Salitre
- Río Torca
- Río Tunjuelo

Río Molinos



Uso del suelo:
Residencial



Río Molinos

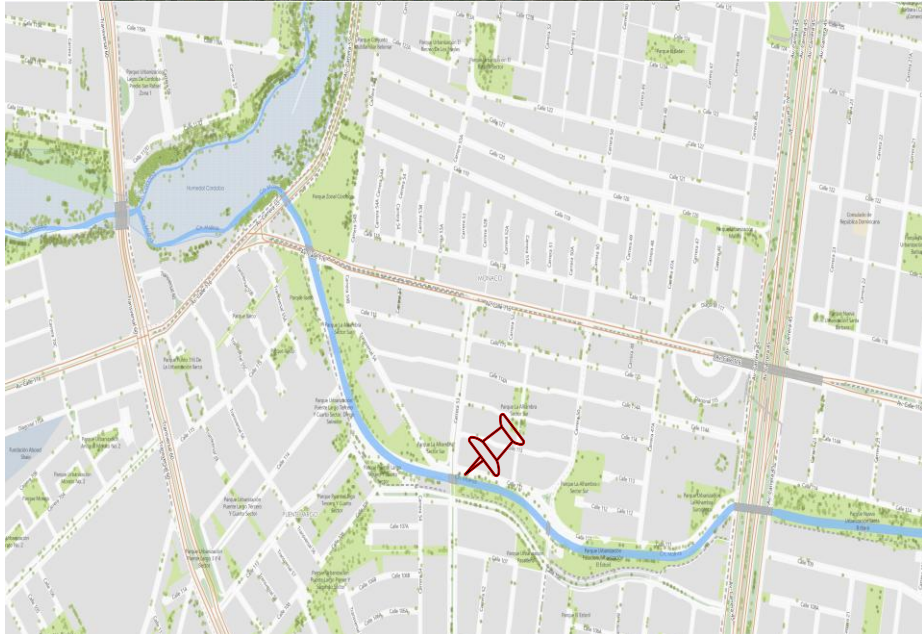
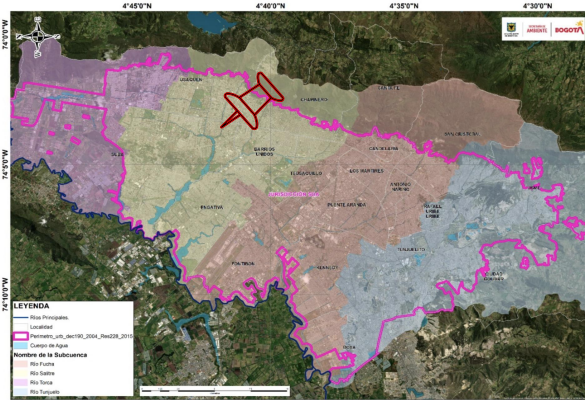
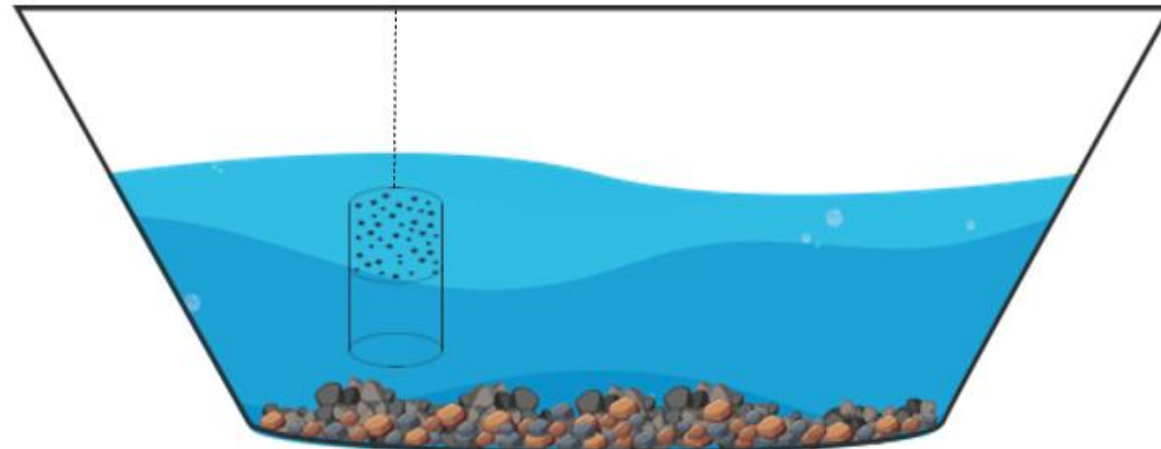


FOTO: Felipe Restrepo Acosta/ EL TIEMPO

Recolección de sedimentos

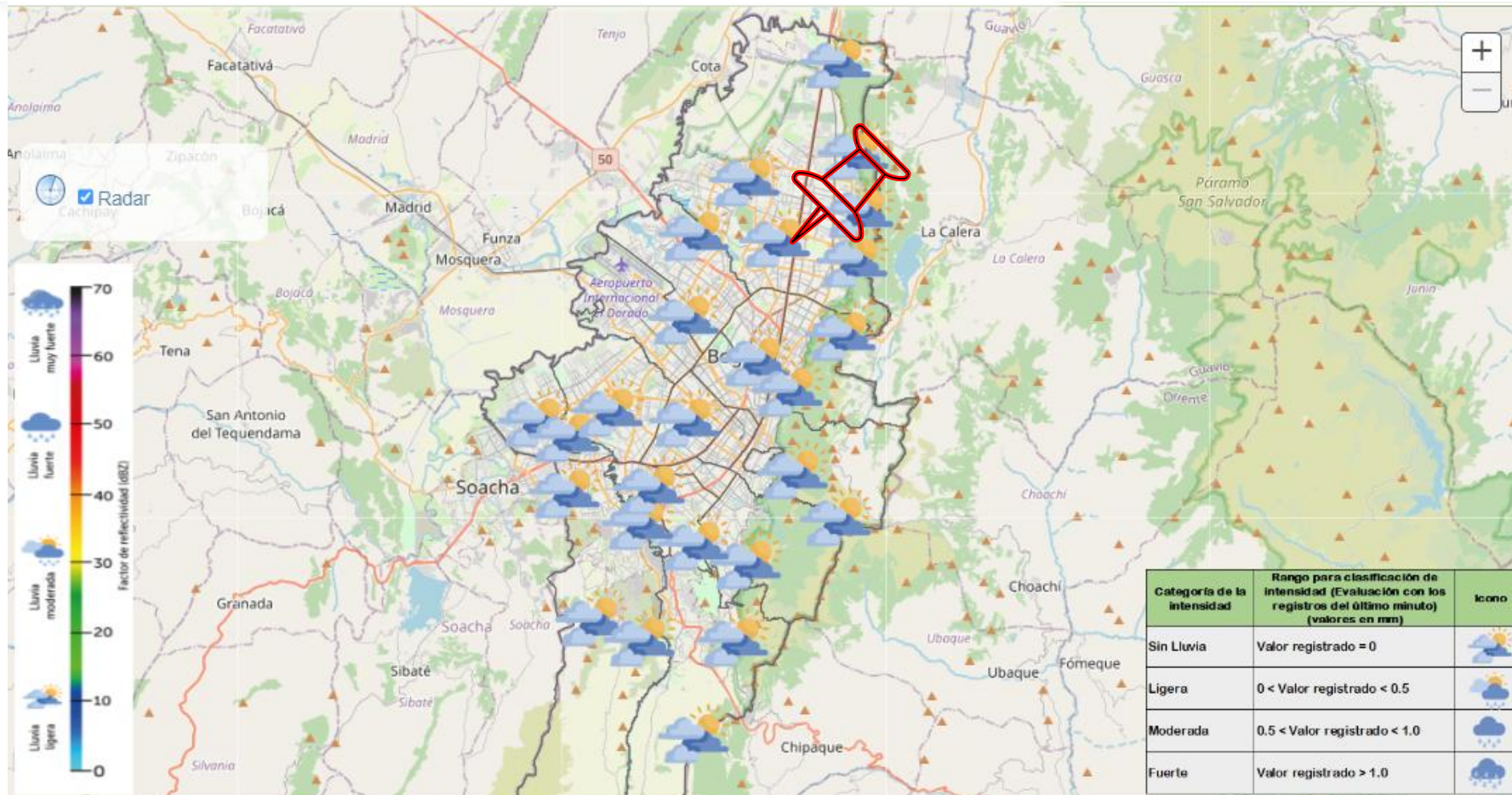


FOTO: Felipe Restrepo Acosta/ EL TIEMPO ZONA



Precipitaciones

Pluviometric station: "Gustavo Morales Morales"

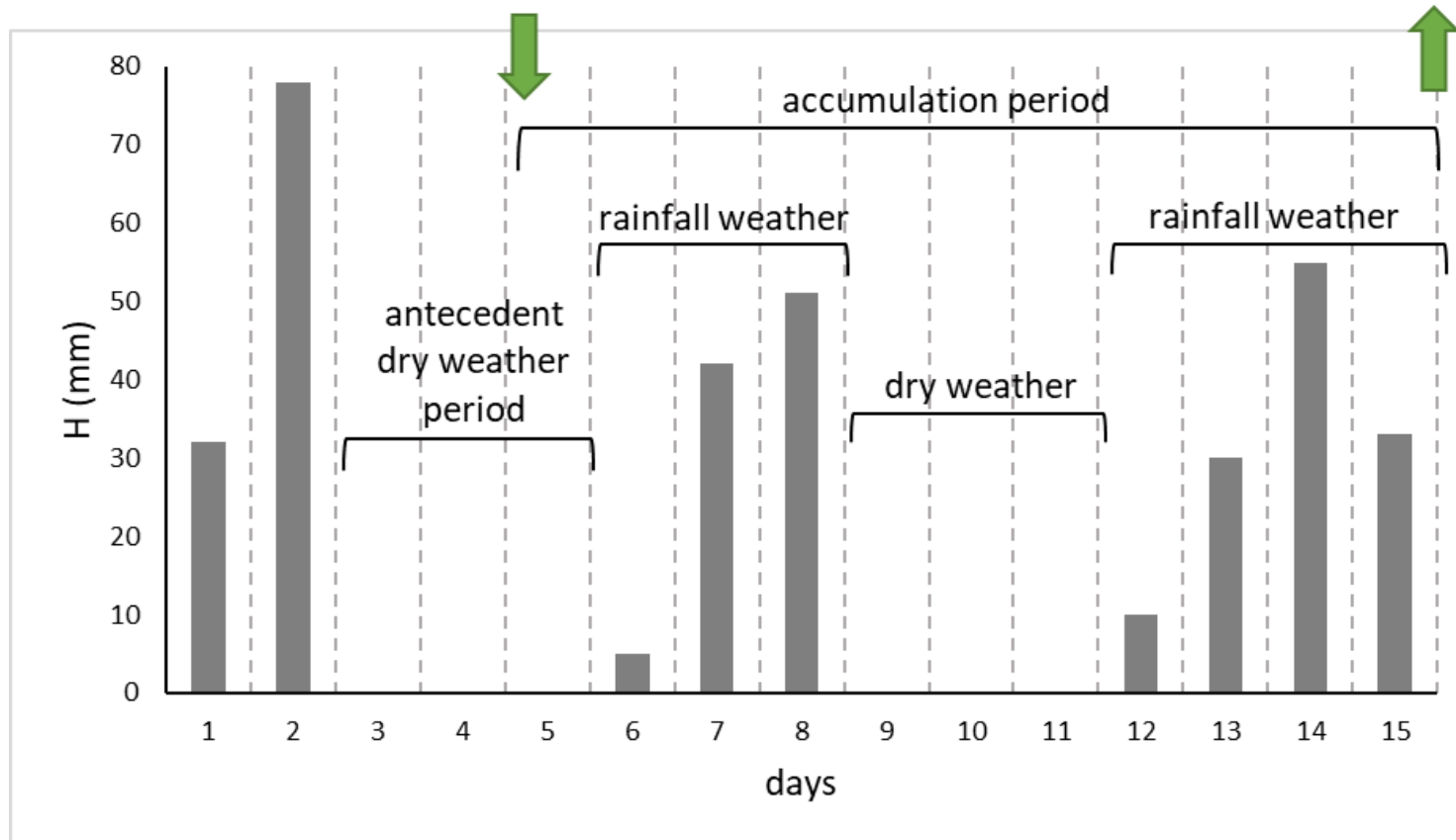


Sistema de Alerta Bogotá
SAB

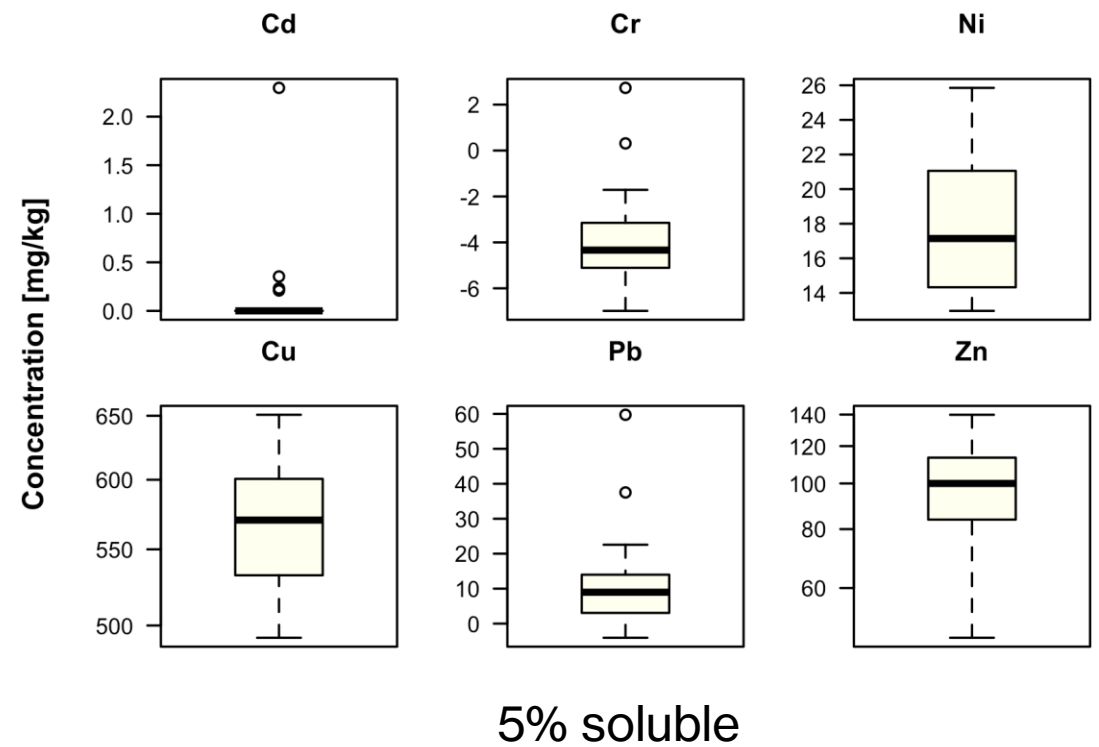
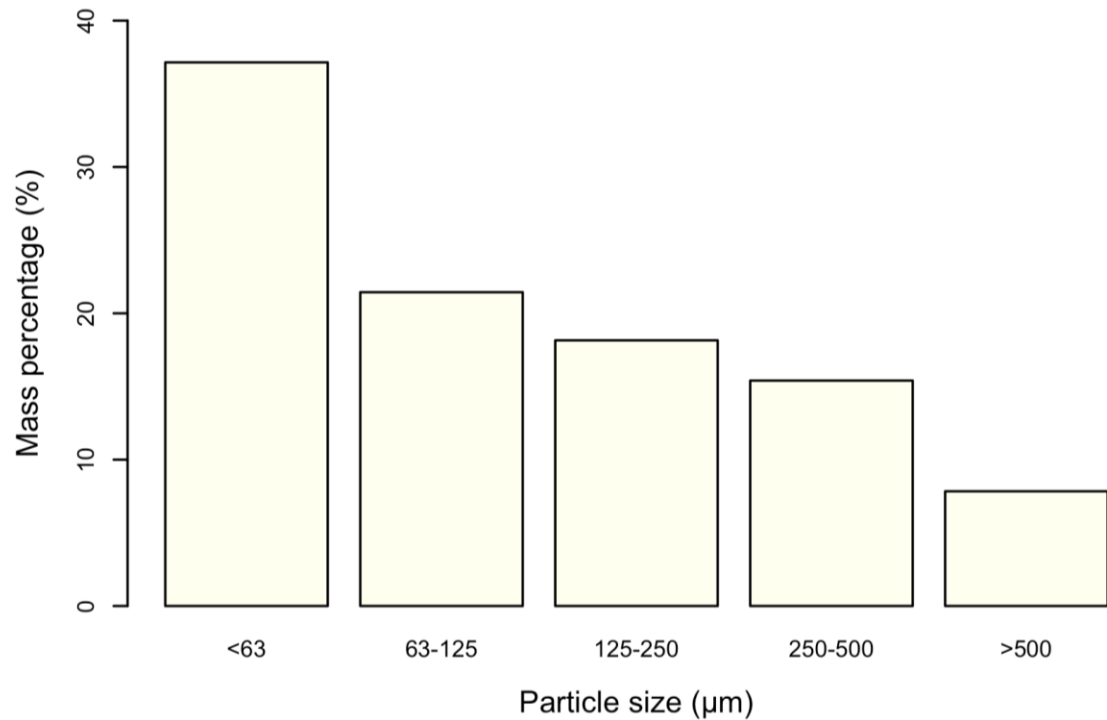


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GESTIÓN DE RIESGOS
Y CAMBIO CLIMÁTICO

Precipitaciones



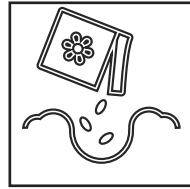
Caracterización de sedimentos



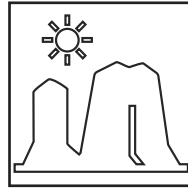
Alternativas de reutilización



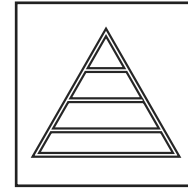
Agriculture



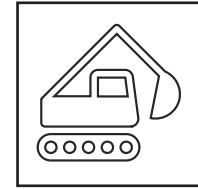
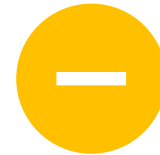
Soil
restoration



Slopes
stabilization



Embankments

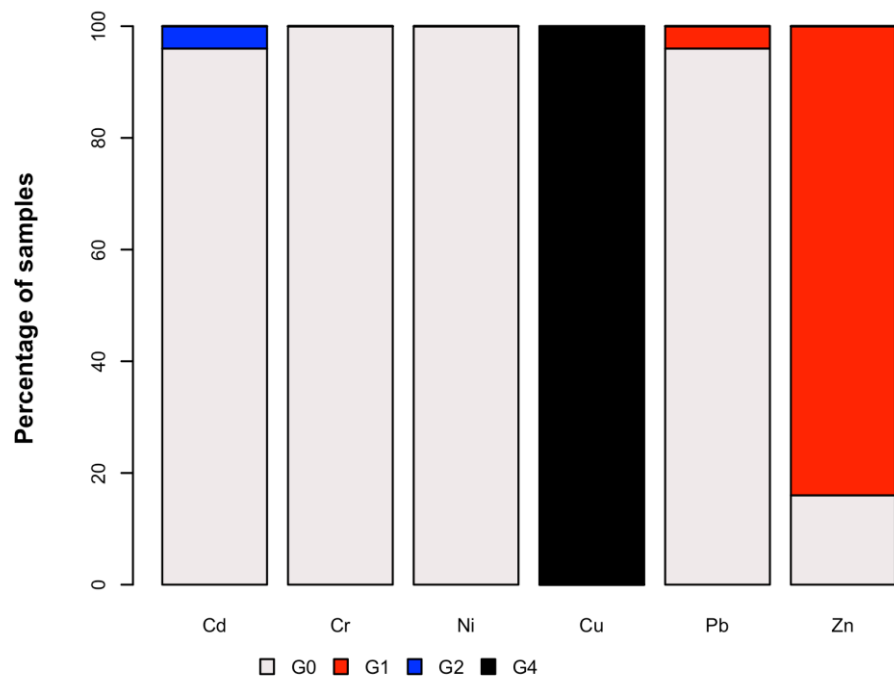


Construction
material



Evaluación riesgo ambiental

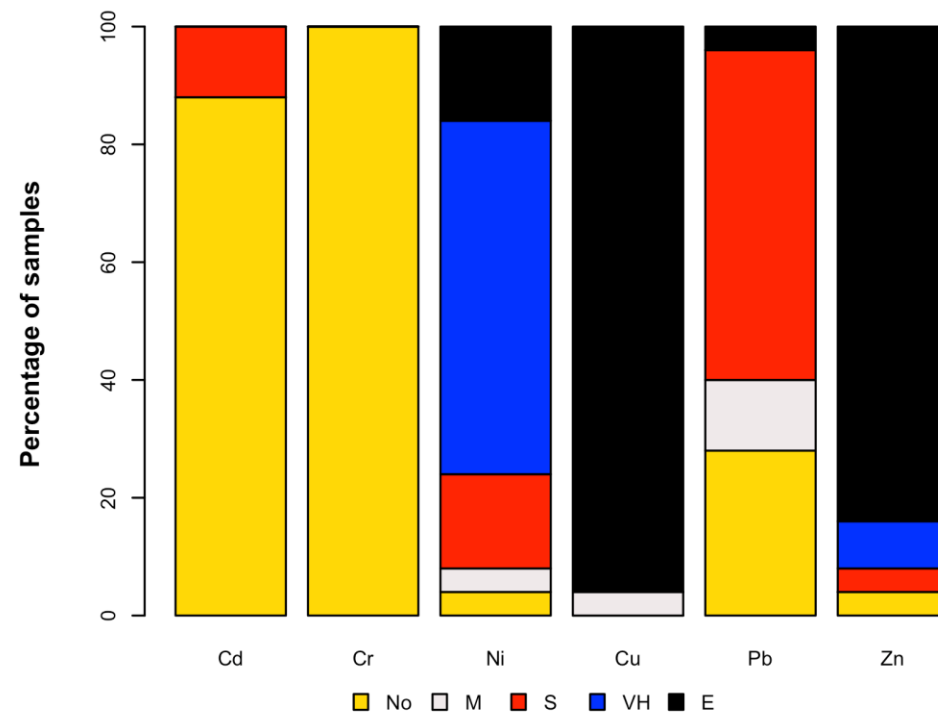
Índice de geoacumulación



G0	unpolluted environment
G1	weakly polluted
G2	moderately polluted
G3	moderately to heavily polluted
G4	heavily polluted
G5	heavily to extremely polluted
G6	extremely polluted

Source: (Laxmi Mohanta et al., 2020)

Factor de enriquecimiento

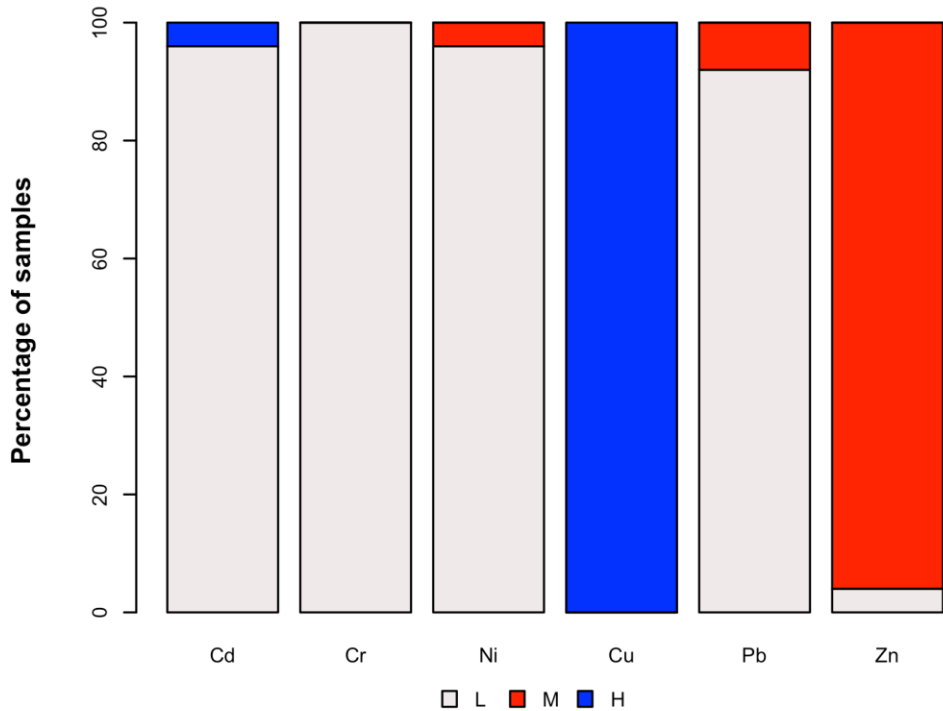


No	deficiency to minimal enrichment
M	moderate enrichment
S	significant enrichment
VH	very high enrichment
E	extreme enrichment

Source: (Choi et al., 2020)

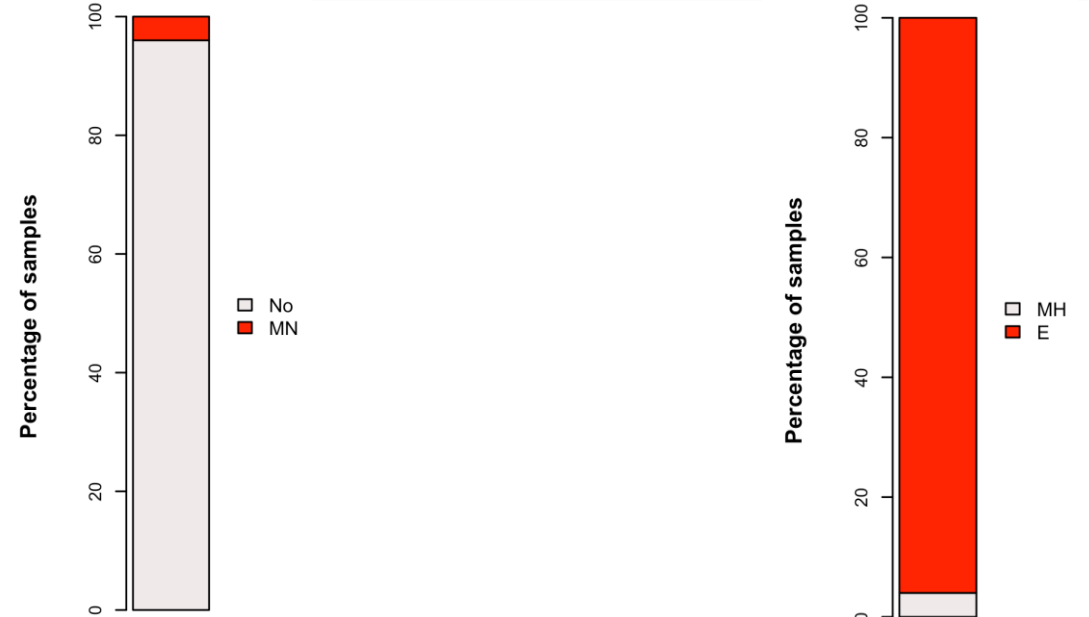
Evaluación riesgo ambiental

Pollution index



L	low level of pollution
M	medium level of pollution
H	high level of pollution

Source: (Laxmi Mohanta et al., 2020)



Bn	background concentration
No	unpolluted
MN	moderately to unpolluted
MP	moderately to polluted
MH	moderately to highly polluted
H	highly polluted
VH	very highly polluted

Source: (Choi et al., 2020)

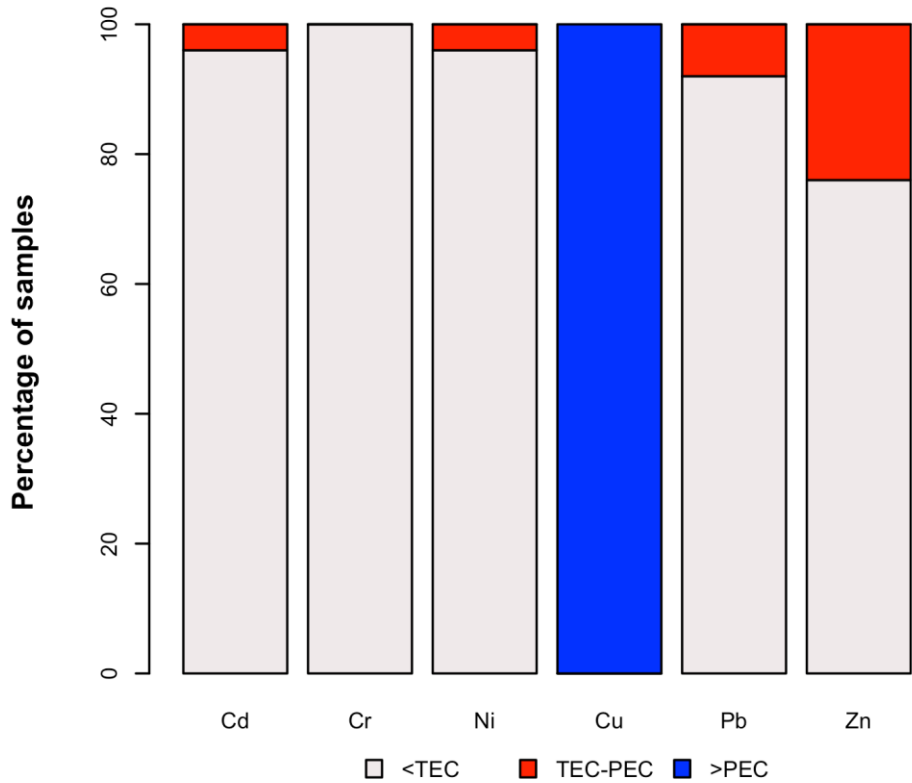
Modificado

No	unpolluted
S	slightly polluted
M	moderately unpolluted
MH	moderately to heavy polluted
H	heavily polluted
E	severely polluted

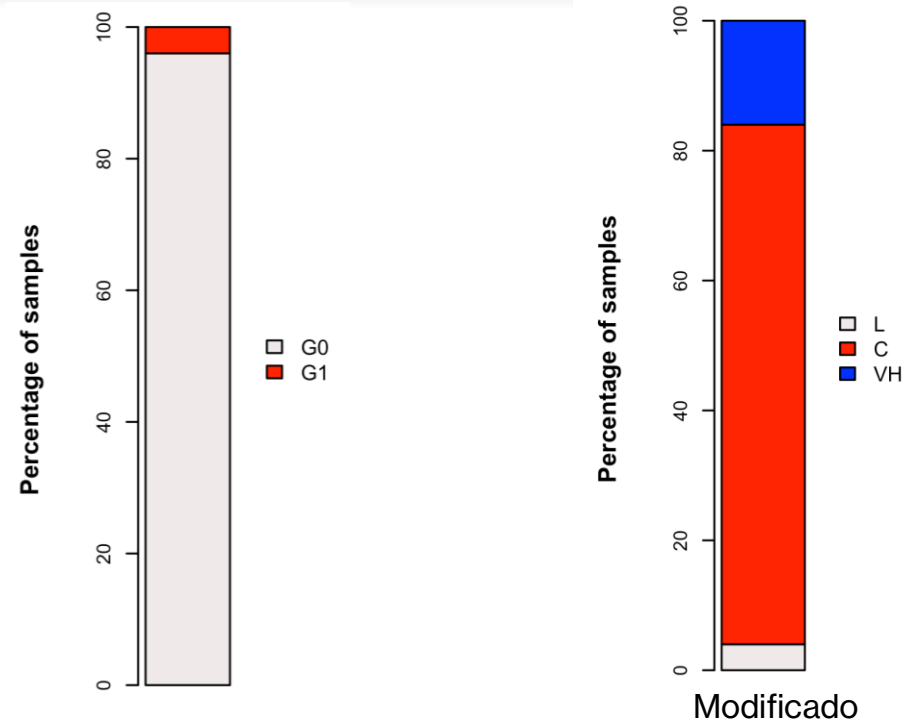
Source: (Brady et al., 2015)

Evaluación riesgo ambiental

Sediment quality guidelines



Riesgo ecológico



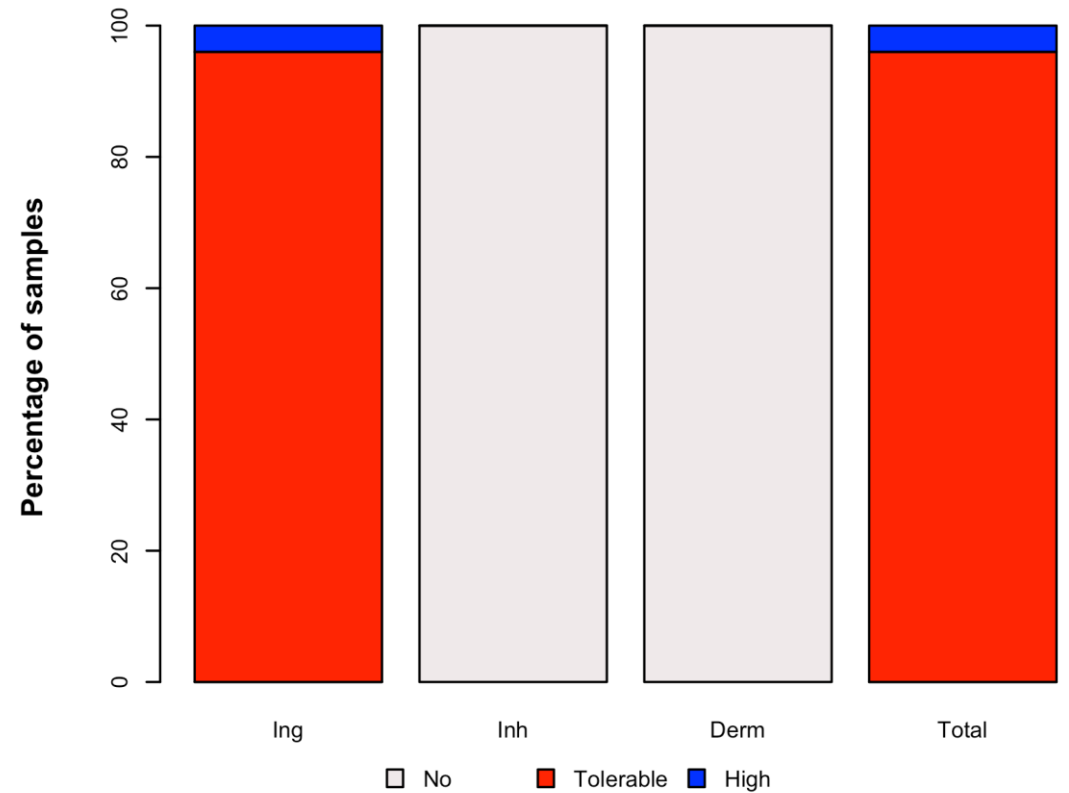
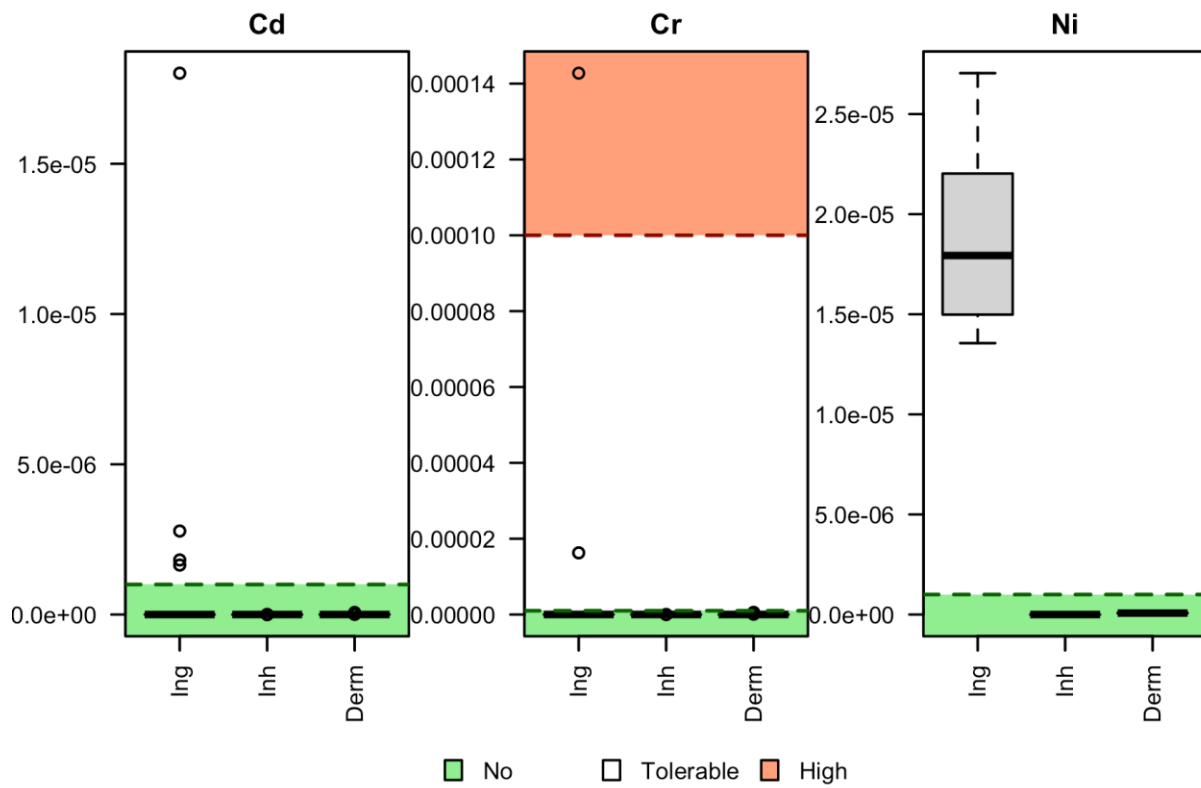
G0	Low ER
G1	Moderate ER
G2	Considerable ER
G3	Very high ER

Source: (Nawrot et al., 2020)

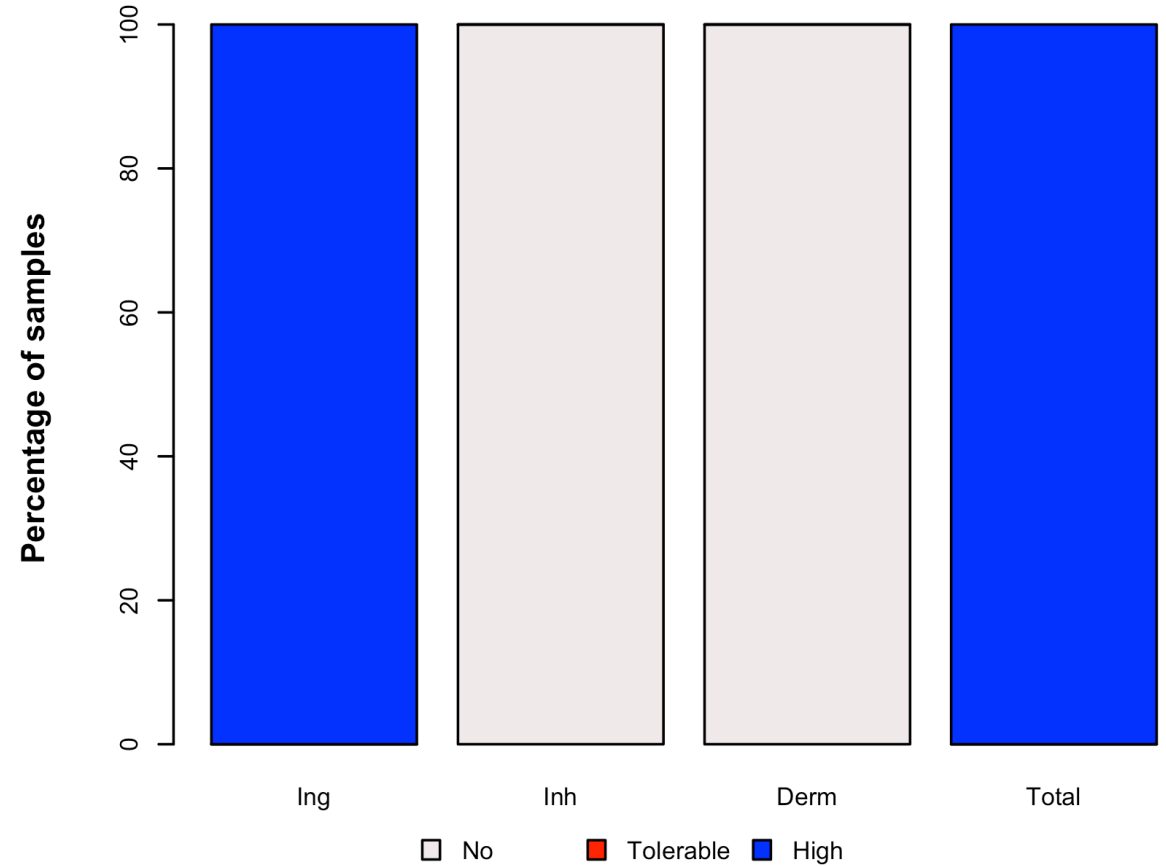
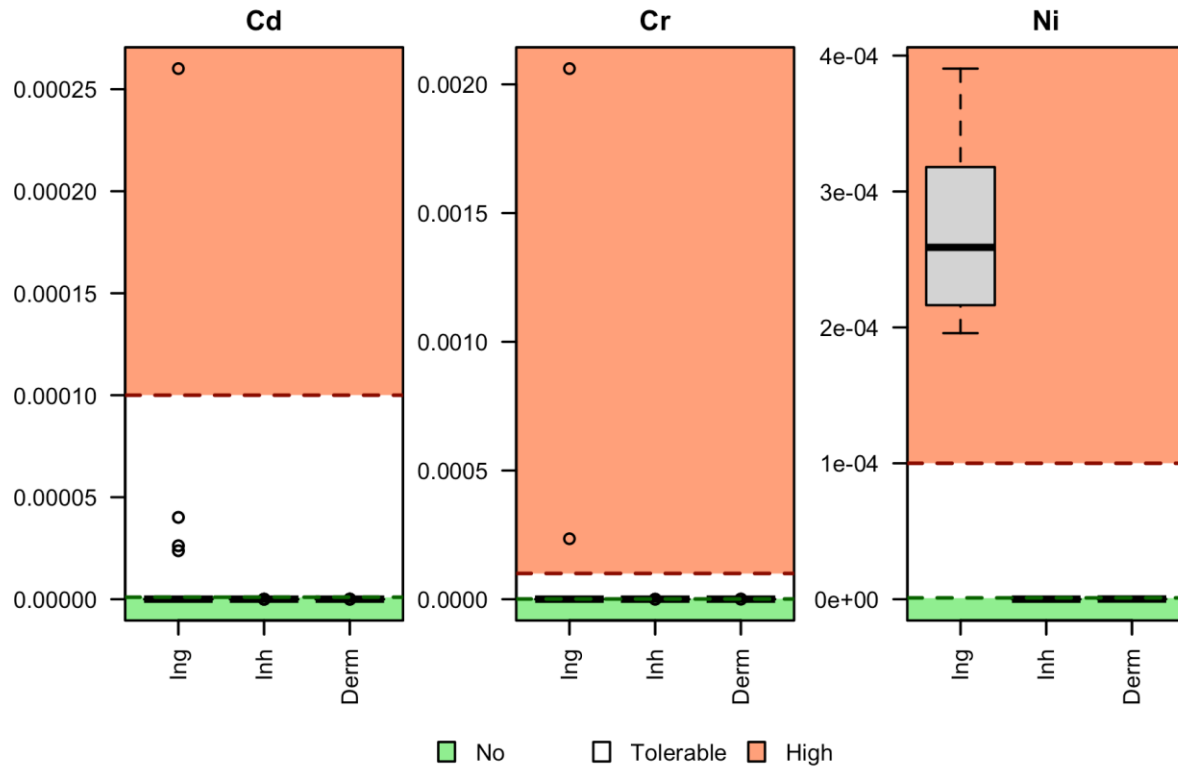
L	Low ER
M	Moderate ER
C	Considerable ER
VH	Very high ER

Source: (Jahromi et al., 2021)

Riesgo en adultos



Riesgo en niños



Elementos de gestión



Opciones de eliminación

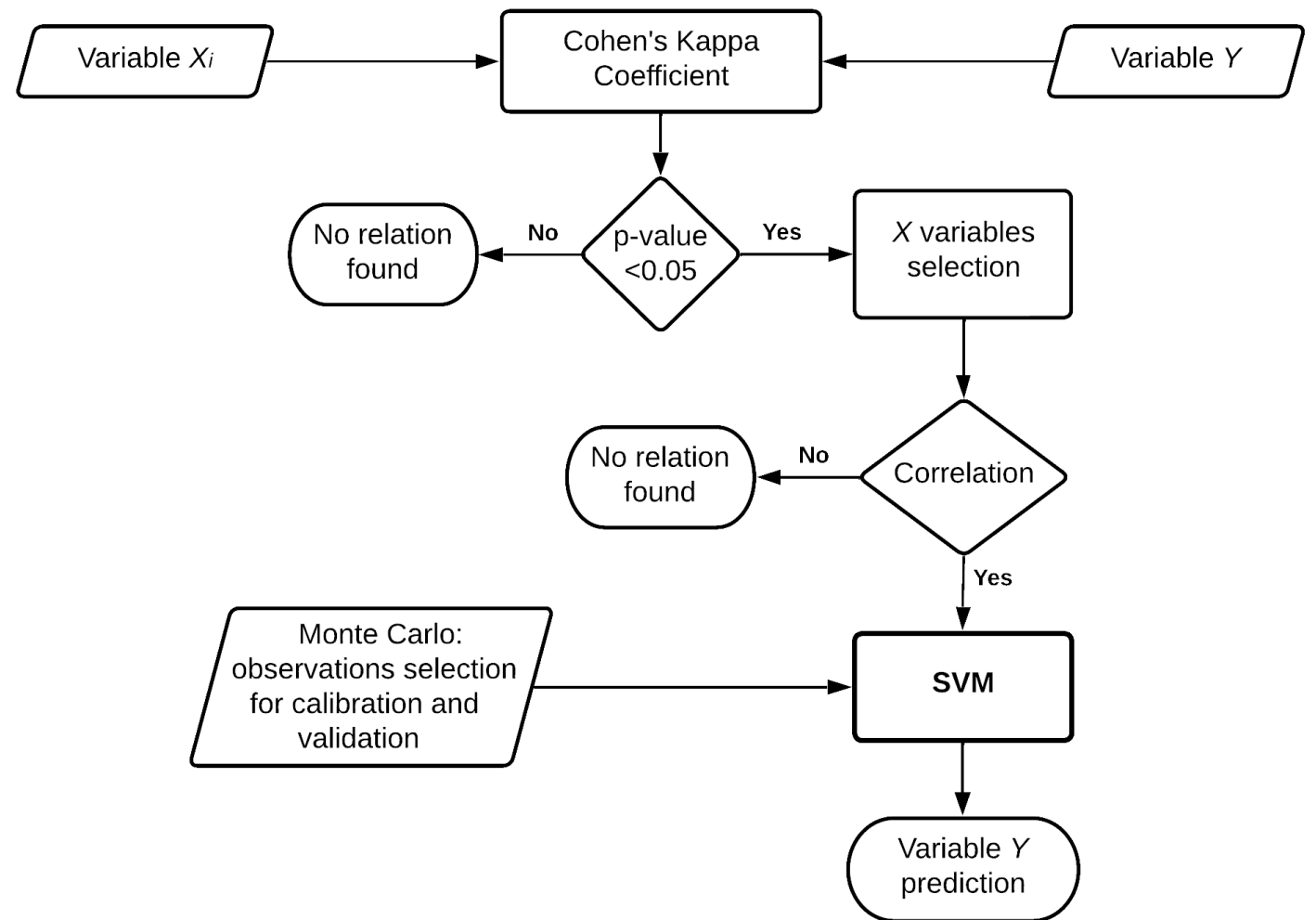


Local SQG



Protocolos de seguridad

Predicción de riesgo



Resultados de modelación

