

A group of women, likely participants in the DHIS2 Climate & Health Academy, are working in a banana field. They are wearing green shirts, some with logos. One woman in the foreground is wearing a patterned headscarf and a colorful skirt. They are surrounded by large banana leaves and trees. The background shows a clear blue sky and more banana plants.

DHIS2 Climate & Health Academy

Oslo 16 - 18 June 2026

Country adoption: DHIS2 for Climate & Health



	Country	HISP group	CH Technology Adoption			Country priority areas					
			DHIS2 Climate App	DHIS2 Climate Tools	Chap & DHIS2 modeling app	Early warning (EWS) for climate sensitive diseases	Malaria, dengue & VBDs	Nutrition & food security	Heat health & air quality	Extreme weather events & health impact	Climate resilient health infrastructure & service delivery
1	Rwanda	HISP Rwanda	2	1	2						
2	Togo	HISP WCA	2	1	2						
3	Uganda	HISP Uganda	3	1	2						
4	Ethiopia	HISP Ethiopia	2	1	1						
5	Mozambique	Saudigitus	2	2	2						
6	Malawi	HISP UNIMA	3	2	2						
7	Tanzania	HISP Tanzania	2	1	1						
8	Laos	HISP Vietnam	2	1	2						
9	Nepal	PHRC + HISP As	2	2	2						
10	Sri Lanka	HISP Sri Lanka	3	2	2						
11	DRC	HISP DRC	1								
12	Ghana	HISP Ghana	2	1	2						
13	Guinea Bissau	Saudigitus	1	1	1						
14	Niger	HISP WCA	1	1							
15	Nigeria	HISP Nigeria	1	1							
16	Senegal	HISP WCA	1	1							
17	Comoros	HISP Rwanda	1	1	1						
18	South Sudan	HISP Tanzania	2	2	2						

Implementation Status

	Concept development
	Piloting
	Operating at scale

Technology adoption status

1	Testing/development (dev environment)
2	Piloting (production at sub-nat'l scale)
3	In production - at scale



UiO : HISP Centre
University of Oslo

Open Climate Service

Climate & Health Academy
Oslo 16 June 2026



Photo by Akil Mazumder

Agenda



- Preview of Open Climate Service (Bjørn and Abyot)
- Using WorldPop data (Andy)
- Country use cases:
 - Sri Lanka: Population exposure to air pollution (Pamod)
 - Malawi: National climate portal (Yambanso)
 - Rwanda: Identifying mosquito hotspots (Knut and Yambanso)
 - Nepal: Temperature and NDVI data from satellites (Bipin)
- Automation with CAPS (Tuzo)
- Wrapping up and questions

Open Climate Service



Open Climate Service is an open-source platform that integrates data from many different sources to produce *tailored climate services* — to help make informed decisions, manage risks, and adapt to climate change.

How can Open Climate Service be tailored for your use case?

The screenshot displays the Open Climate Service web application. The main header shows the service name and a description: "An open-source platform that integrates data from many different sources to produce tailored climate help make informed decisions, manage risks climate change." Below this are "Get started" and "GitHub" buttons.

The "How it works" section illustrates the data flow: DATA (Climate & weather, Environment, Population & society, Local & national sources) feeds into the OPEN CLIMATE SERVICE, which then provides Download and Keep current options.

The "Nepal Climate Service" instance is shown with the following details:

- INSTANCE: Nepal
- Bounding box: 88.85, 26.35, 88.2, 30.45
- Country code: NPL

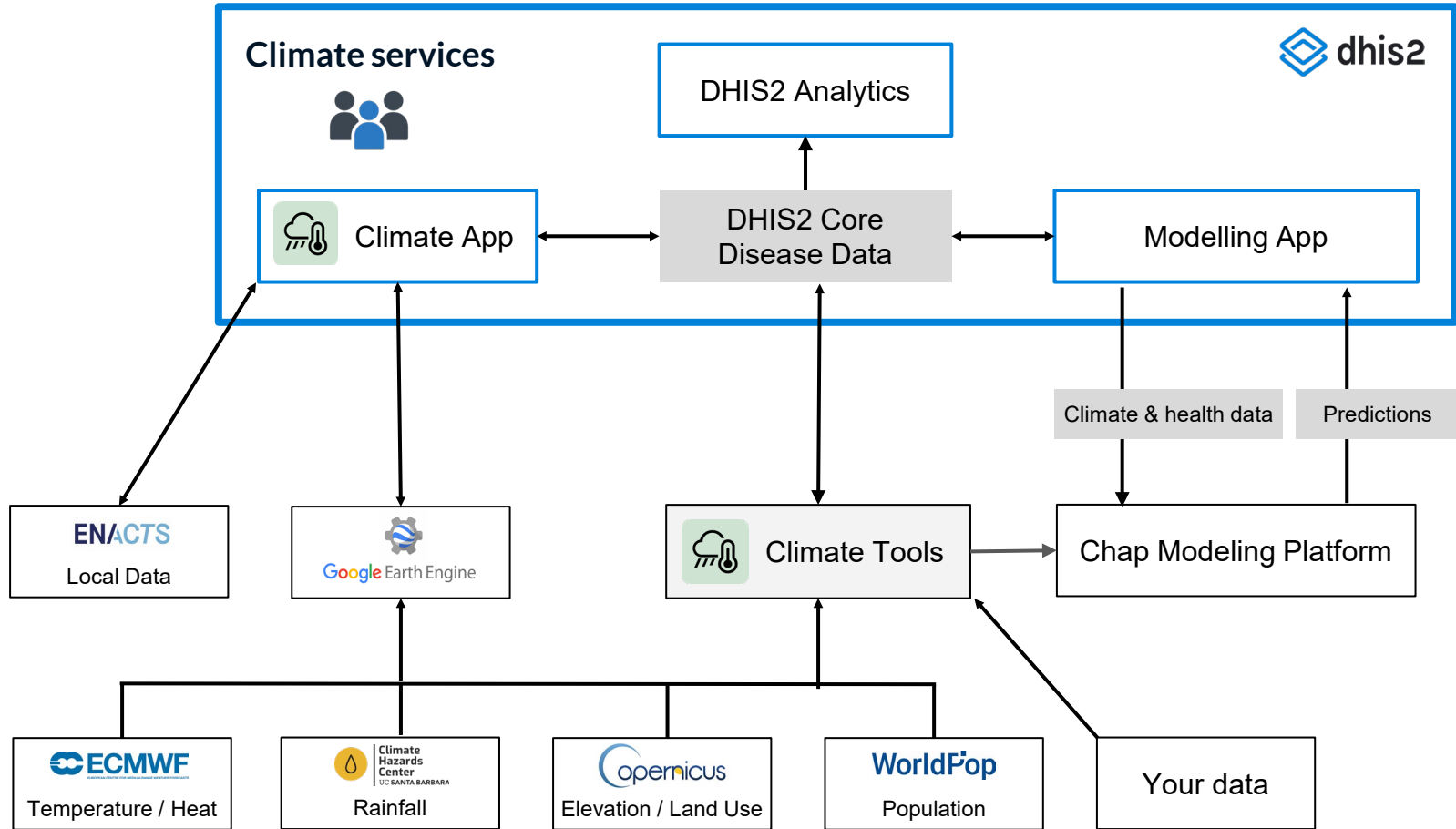
The DATASETS table lists the following data sources:

Name	Variable	Period	Temporal coverage	Status
Elevation (Copernicus DEM GLO-30)	elevation	yearly	None - None	published
2m temperature (ERA5-Land)	t2m	hourly	2026-01-01T00 - 2026-01-07T23	published
Land Cover (ESA CCI)	lccls_class	yearly	1992 - 1992	published
Total population (WorldPop Global2)	pop_total	yearly	2015 - 2030	published

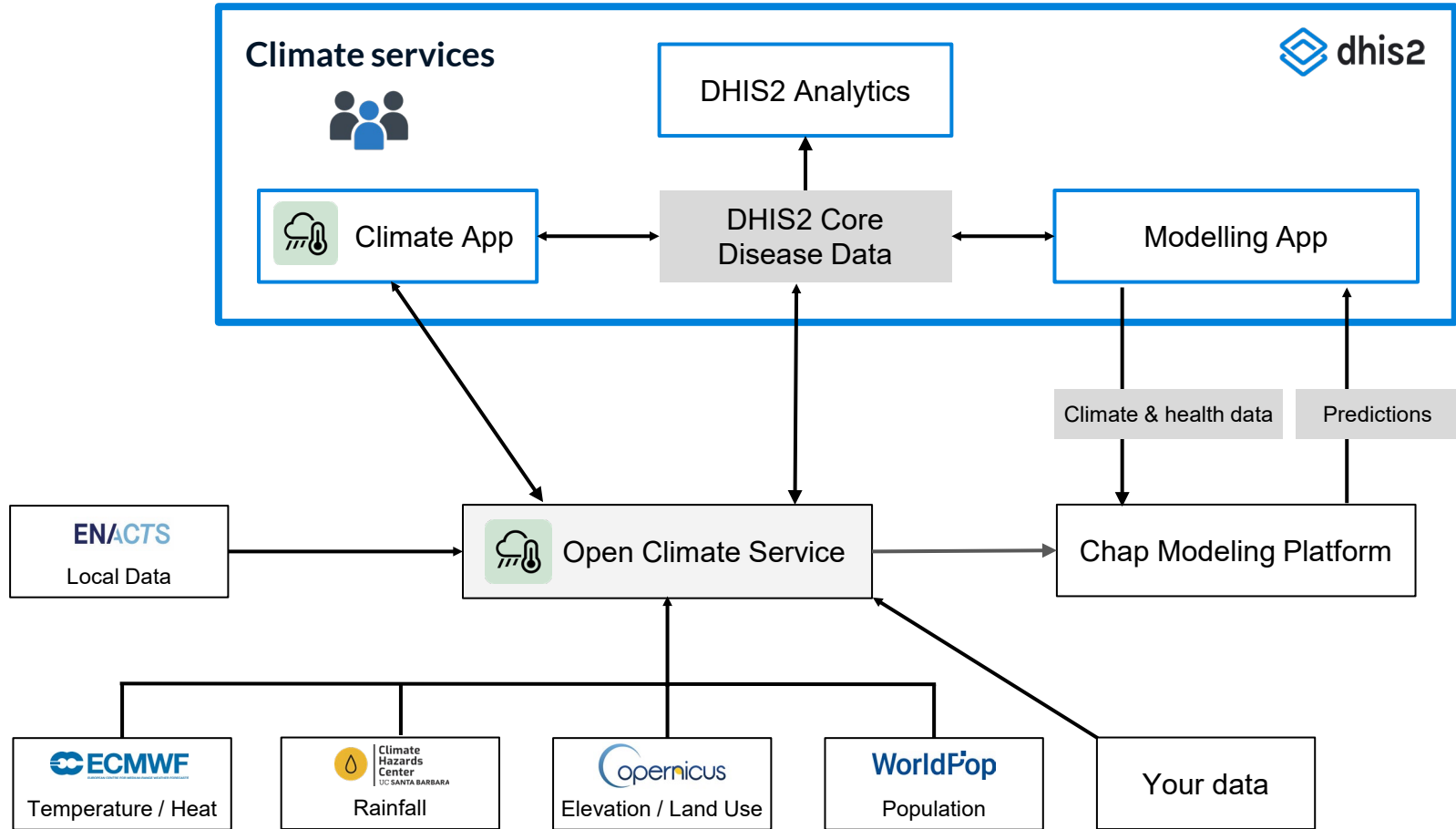
The AVAILABLE DATASET TEMPLATES section shows a table with columns: Name, Variable, Period, Source.

The bottom part of the interface features a map viewer displaying a topographic map of Nepal, with a legend indicating elevation in meters (0 to 4000).

Building Blocks for Climate Services



Building Blocks for Climate Services



Digital Sovereignty

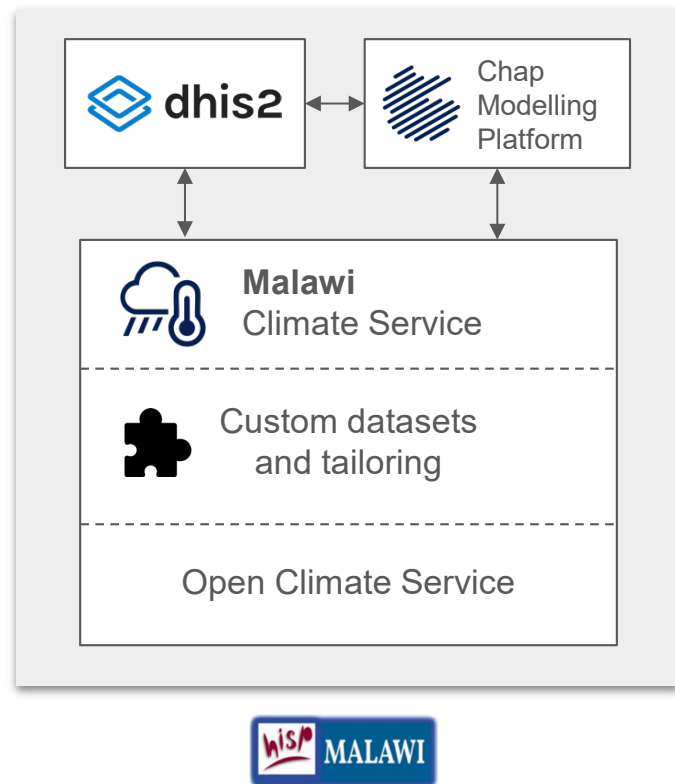
Your data, your infrastructure:

Deploy on your own servers, or any other infrastructure you control.

No dependency on proprietary platforms.

Countries retain full ownership of their data and can operate the service independently.

Where should it be hosted?



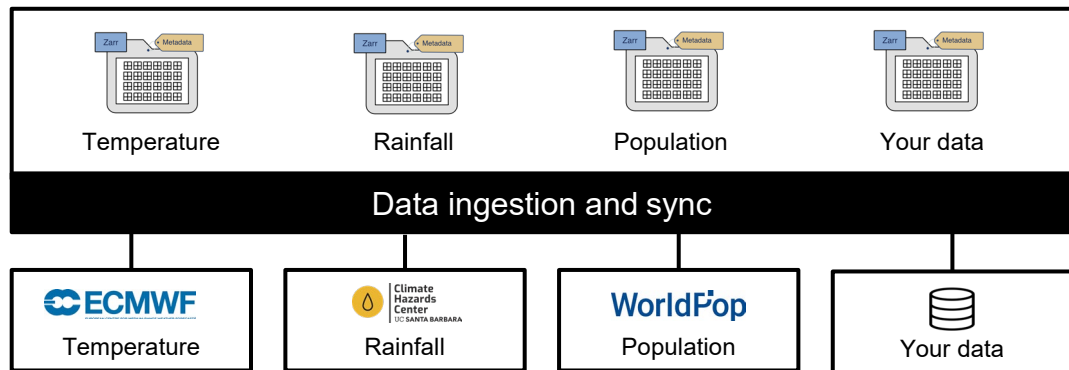
Bringing data into Open Climate Service

Open Climate Service contains no data when you install it.

What data to include is up to you and the use cases you want to solve.

We have made it easy to ingest global data (satellite, climate reanalysis, population) - and keeping the data up to date.

Open Climate Service can easily be extended to ingest the data you need.



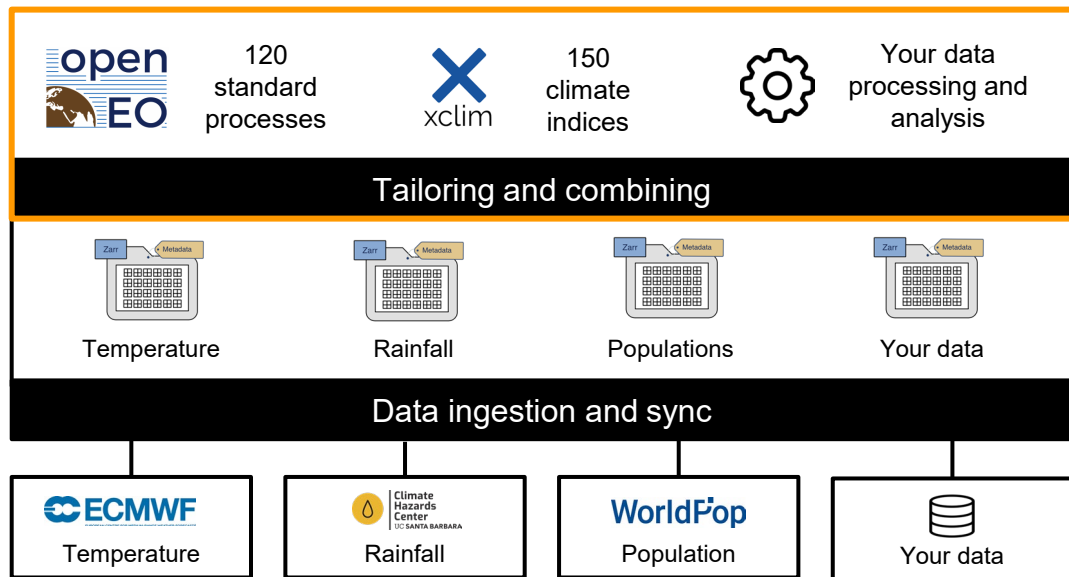
Tailoring data in Open Climate Service

Climate and environmental data needs to be tailored to specific use cases.

Open Climate Service includes 120 standard processes allowing you to combine and analyse your data.

We have also included 150 standardised climate indices widely used in the scientific community.

Add your own data processing and analysis if needed.



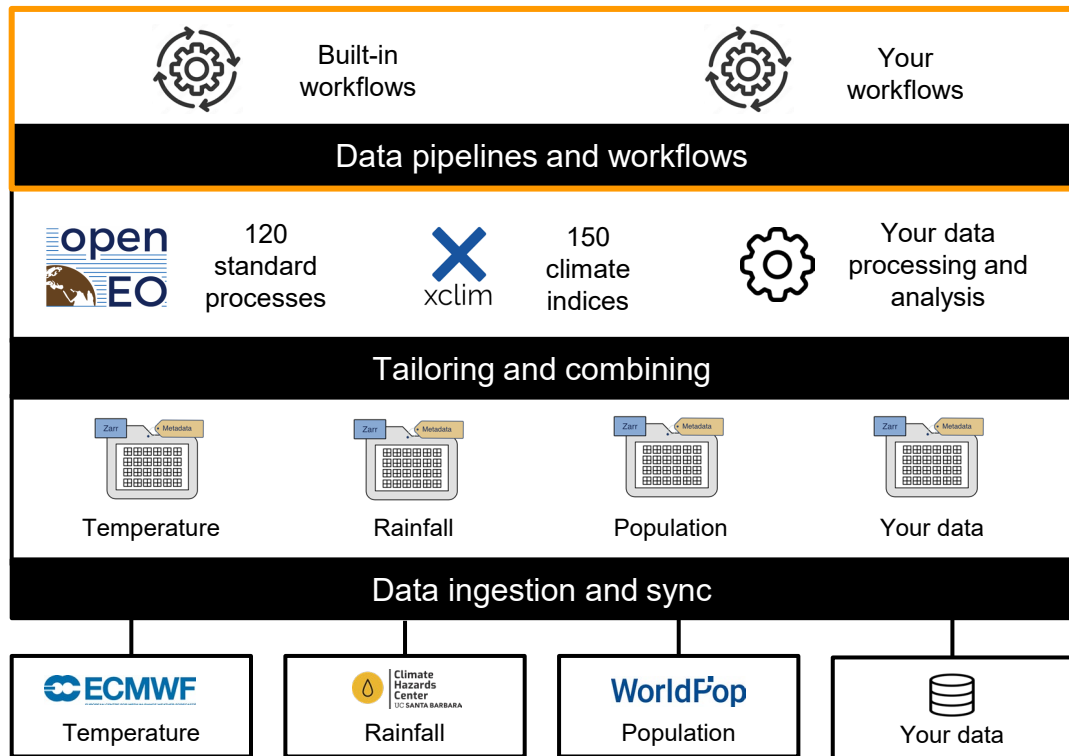
Building data pipelines and workflows

To get the data in the format you need, chain multiple processes together into a complete workflow.

Open Climate Service has built-in workflows allowing you to harmonise climate and population data to DHIS2 org units.

Add your workflows to meet the needs of your use case.

Both processes and workflows are based on the openEO standard.



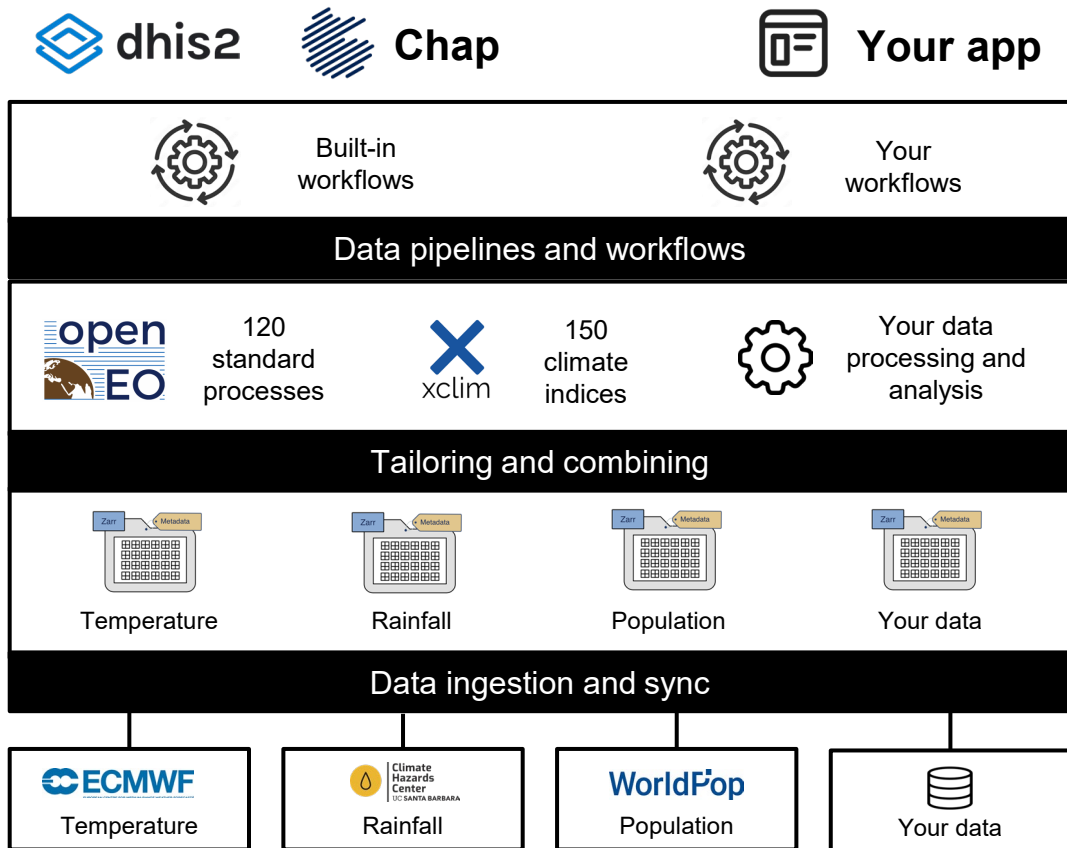
Bring tailored data into DHIS2 and Chap

Open Climate Service provides an open, standards based interface allowing you to access data and trigger workflows.

The results can be presented in DHIS2, or be further analysed in the Chap Modelling Platform.

You can also build your own custom app, within or outside DHIS2.

Open Climate Service can be used for different domains.

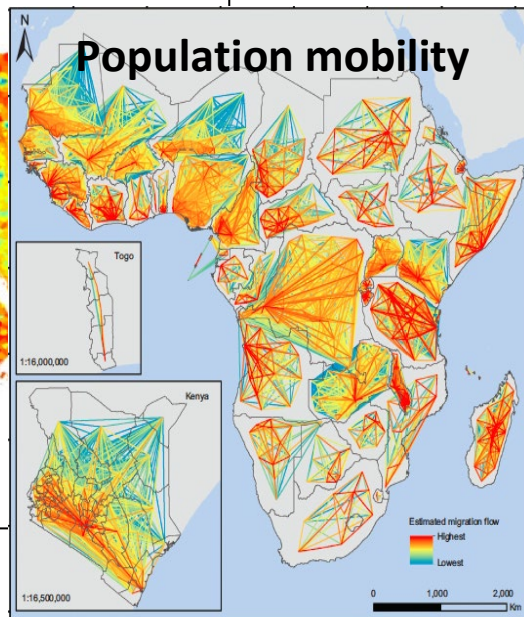
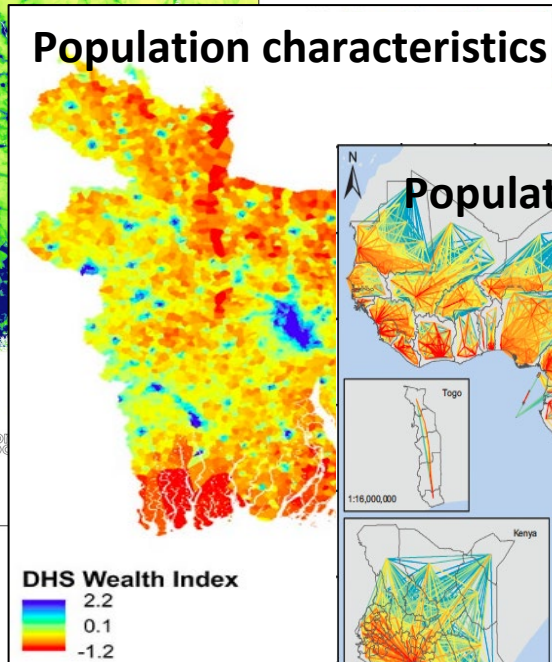
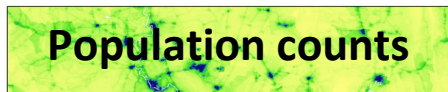




WorldPop data for Climate & Health

Andy Tatem

Founder and Director of WorldPop



WorldPop is an applied research and implementation group at the University of Southampton, UK

The group focuses on co-designing methods with stakeholders that use novel geospatial data for mapping small area demographics and dynamics

WorldPop also works with partners to apply these data in areas such as census support, maternal health, childhood vaccination, epidemiology

Outputs and methods are made openly available and are widely used by government, UN agencies, researchers

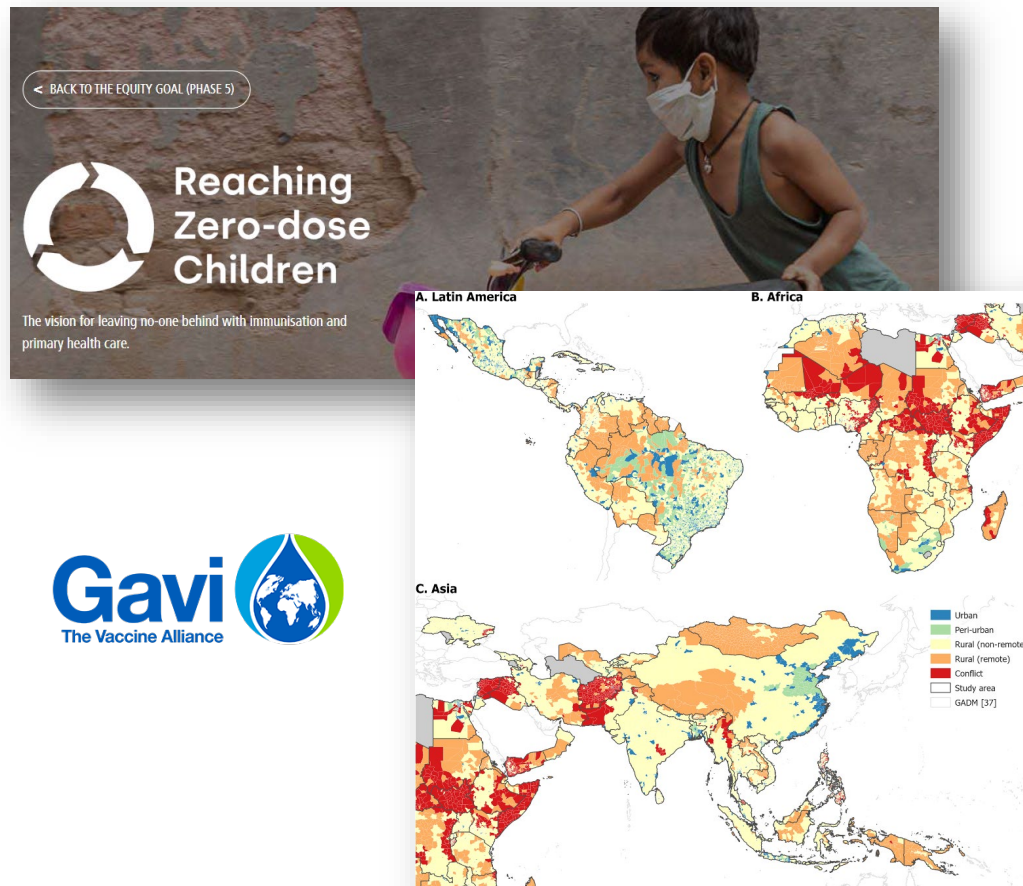
Examples of WorldPop Global data in use: Vaccination strategies

WorldPop

-Global strategies for reaching zero-dose children require evidence to guide them

-WorldPop global data are being routinely combined with vaccination coverage estimates to quantify numbers residing in different settings

-These estimates form part of GAVI's strategies on reaching zero-dose children

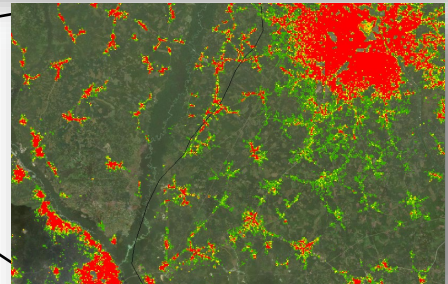
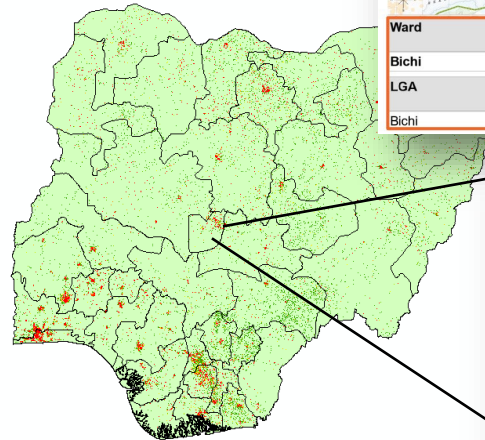
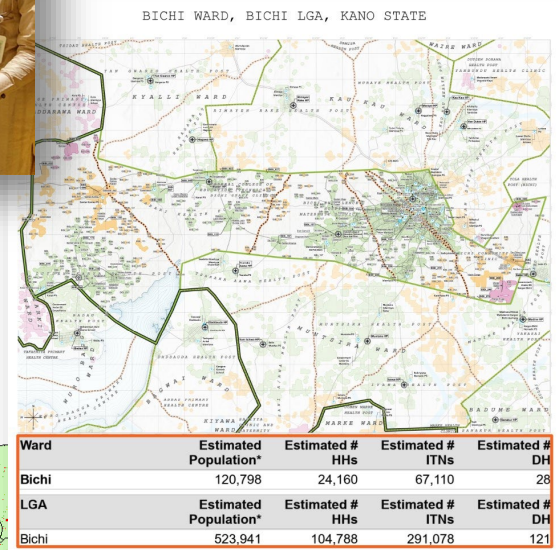


Nigeria

- The last census in Nigeria was in 2006 and projections have been found to be inaccurate at subnational scales
- The need for small area estimates for polio vaccination planning and implementation prompted the development of modelled estimates based on sample field enumerations
- Bottom-up modelled estimates were co-developed with the National Population Commission as part of GRID3 and used in multiple vaccination campaigns



NPHCDA
National Primary Health Care Development Agency



Examples of WorldPop Global data in use: Future scenarios

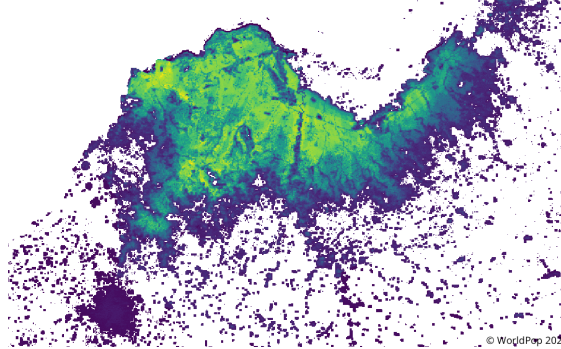
-Modelled scenarios of future demographic change exist up to 2100, but only at coarse spatial scales, presenting a barrier to integration with high resolution climate and hazard risk model outputs

-WorldPop constructed a set of 1km resolution gridded future population datasets from 2030 to 2100 aligned with the shared socioeconomic pathways scenarios

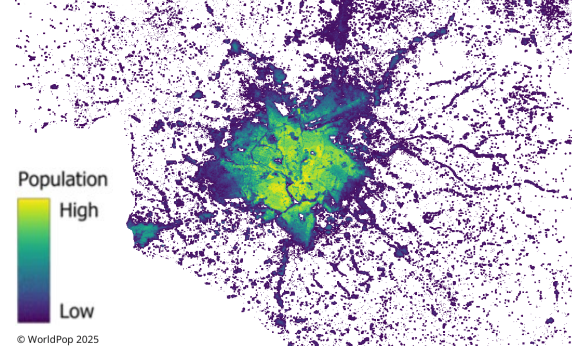
-These are now integrated in the IPCC coupled model intercomparison project standard datasets for modelling future impact scenarios

WorldPop FuturePop

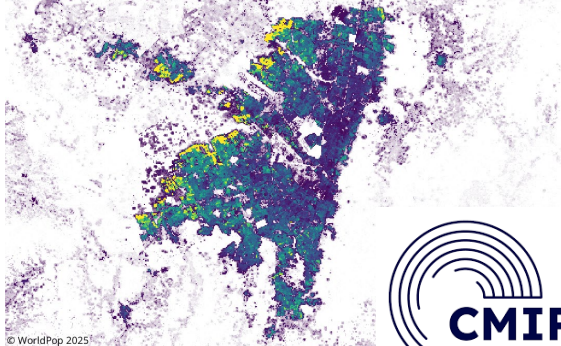
Population distribution of Kinshasa under SSP2 scenario, 2025



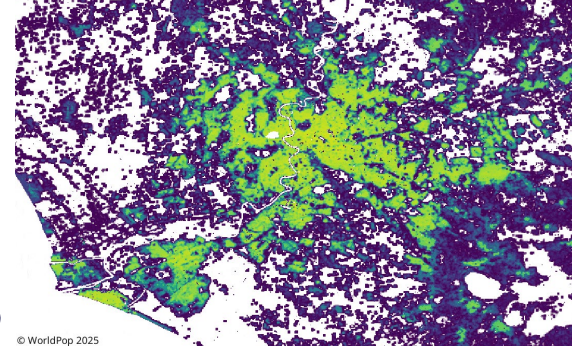
Population distribution of Lubumbashi under SSP2 scenario, 2025



Population distribution of Bogotá under SSP1 scenario, 2025



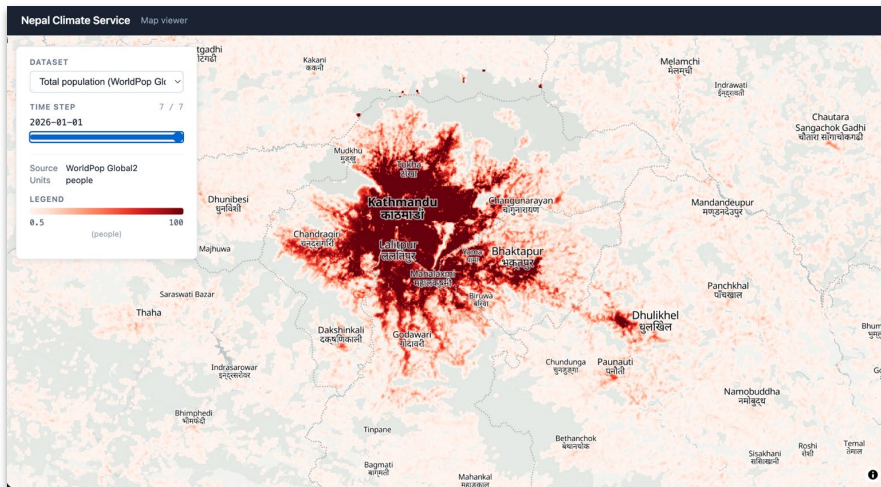
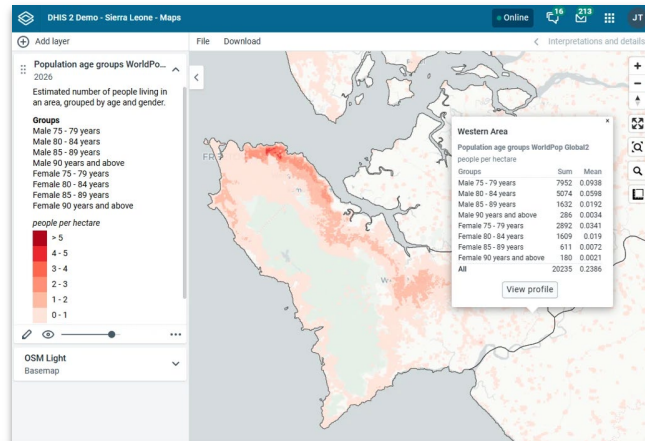
Population distribution of Rome under SSP4 scenario, 2025



WorldPop & DHIS2

WorldPop and DHIS2 are having a close collaboration.

WorldPop Global 2 is already available in Open Climate Service, DHIS2 Maps, DHIS2 Import/Export, and DHIS2 Climate Tools.



Sri Lanka

Climate Services



Inform
Decisions



Build
Resilience



Protect
Health

 dhis2

 Chap

calculate population exposure and
aggregate to org units

Workflows

population
exposure

aggregate
spatial

Processing



PM 2.5



Population



PM 2.5 exposure

Data ingestion

°CICERO
PM 2.5

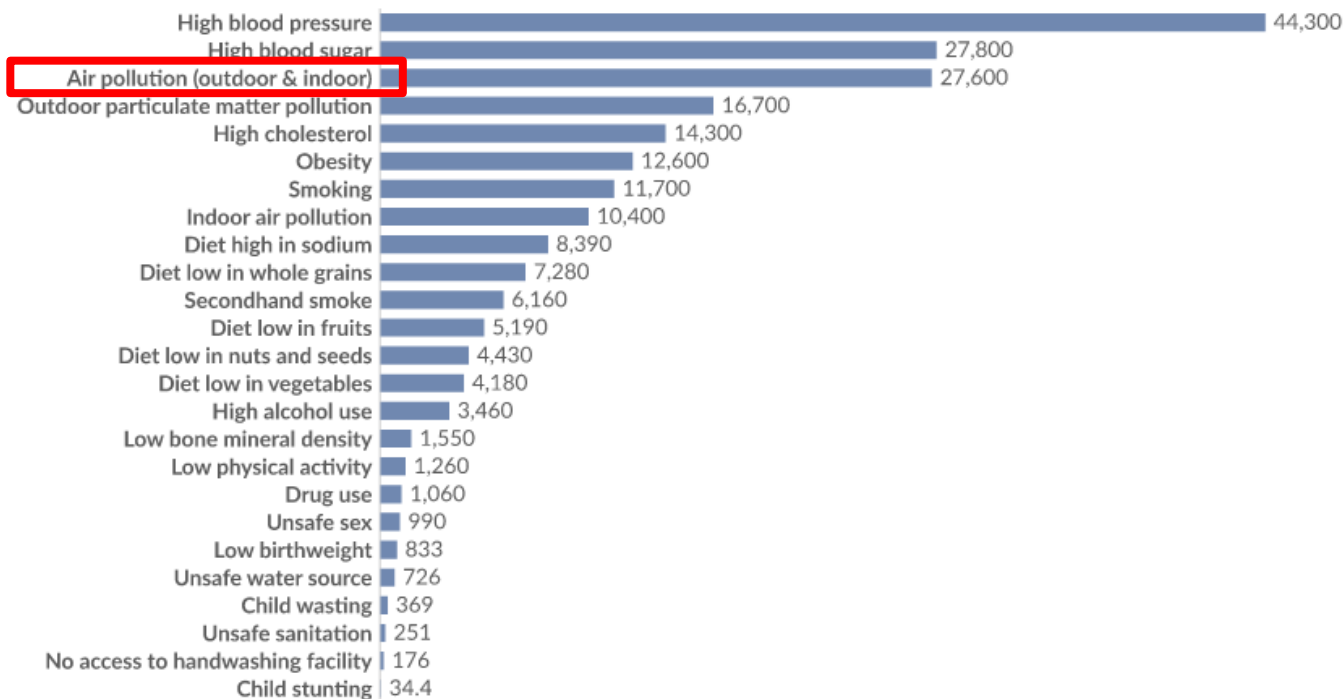
WorldPop
Population



Deaths by risk factor, Sri Lanka, 2023

Our World
in Data

The estimated annual number of deaths attributed to each risk factor. Estimates come with wide uncertainties, especially for countries with poor vital registration.



Data source: IHME, Global Burden of Disease (2025)

OurWorldinData.org/causes-of-death | CC BY

Note: Risk factors are not mutually exclusive. The sum of deaths attributed to each risk factor can exceed the total number of deaths.

Opportunity



Air quality data

Air quality data is available from NBRO and Environmental Authority in Sri Lanka.



ICD-10 health data

ICD-10 coded health data is available via eIMMR (Indoor Morbidity and Mortality Register).



EMR systems data

EMR systems across government hospitals capture OPD and inward patient data.



Morbidity and mortality analysis

There is potential to analyze morbidity and mortality linked to air quality patterns.

Strategic Collaboration Across Sectors

- **Ministry of Health Sri Lanka** - Health data ownership and approvals
- **CICERO** - Technical assistance and modelling
- **HISP Sri Lanka** – Coordination and Technical support
- **NBRO and Environmental Authority** - Daily resolution air quality data provision
- **HISP Center UIO** – Coordination and strategic planning

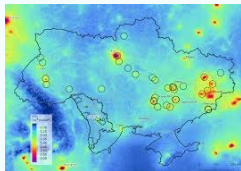


Data Sources

PM 2.5 data
from 22
weather
stations



Satellite data



Gridded
Air quality
data

NetCDF
file

°CICERO
Center for International
Climate Research

1. Retrieval
2. Processing
3. Spatial aggregation
4. Population weighting

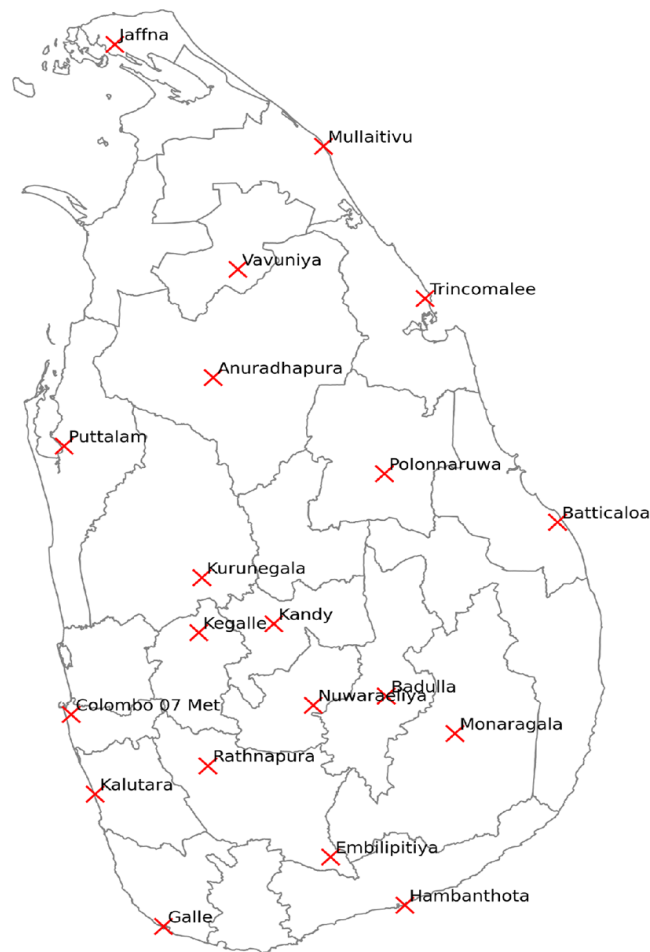


Population
Data

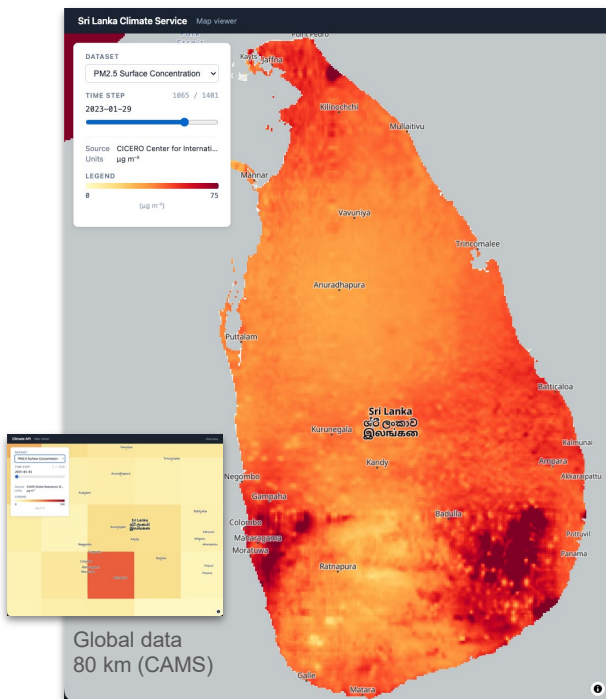
eIMMR

Indoor Morbidity and
Mortality Registry

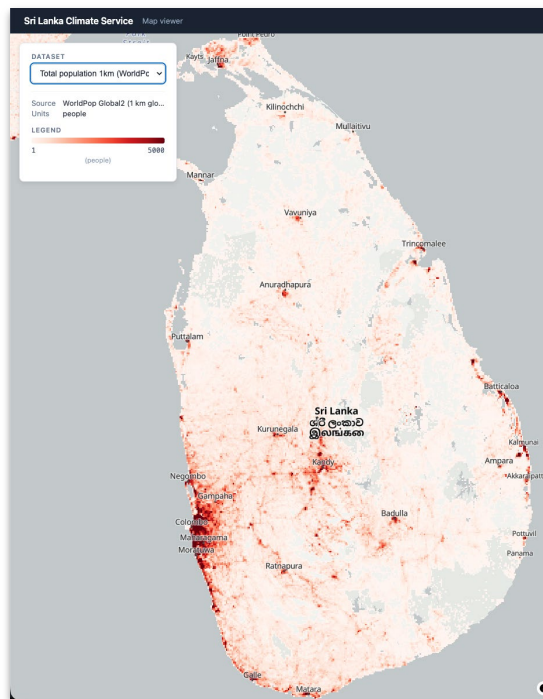
Locations of monitoring stations



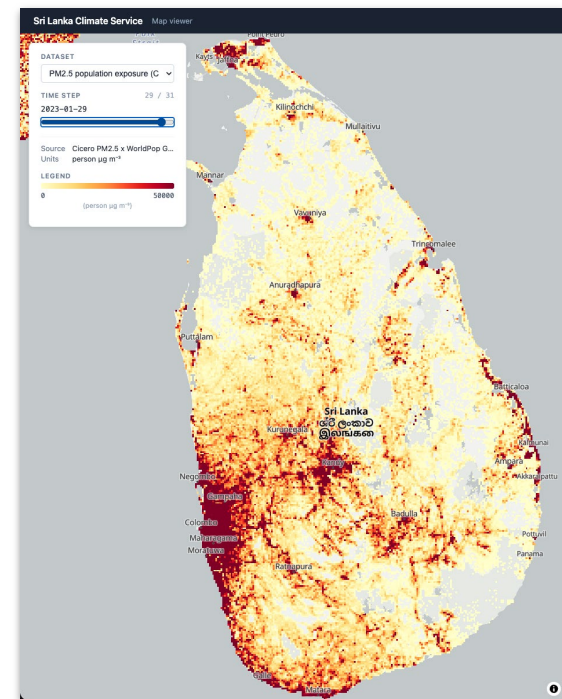
Sri Lanka Climate Service



PM2.5 for Sri Lanka (1x1 km)



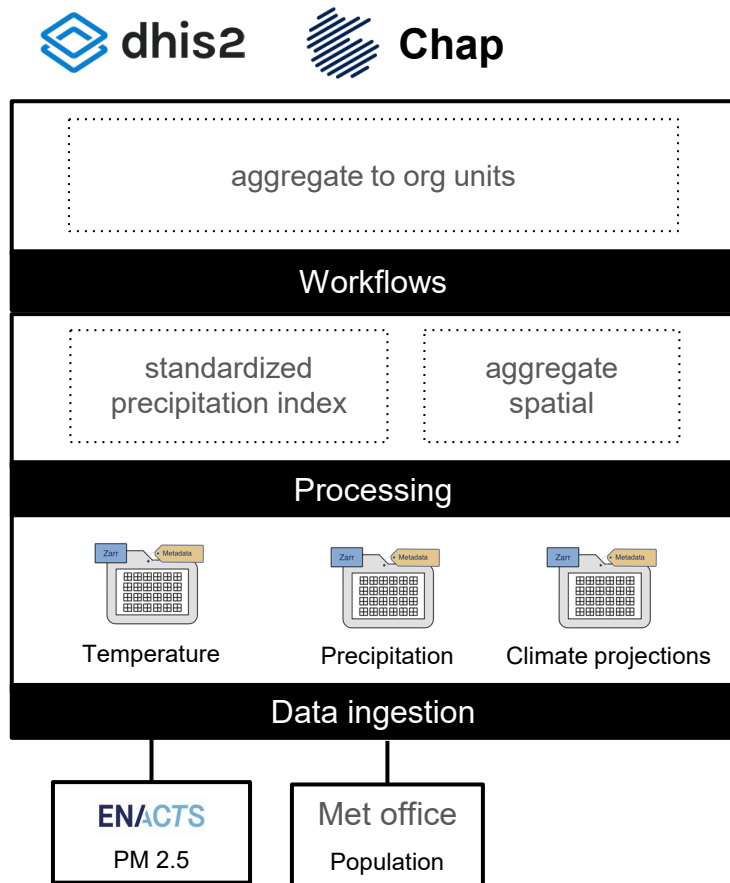
WorldPop Population (1x1 km)



PM2.5 exposure (1x1 km)

Global data + local station data +
modelling

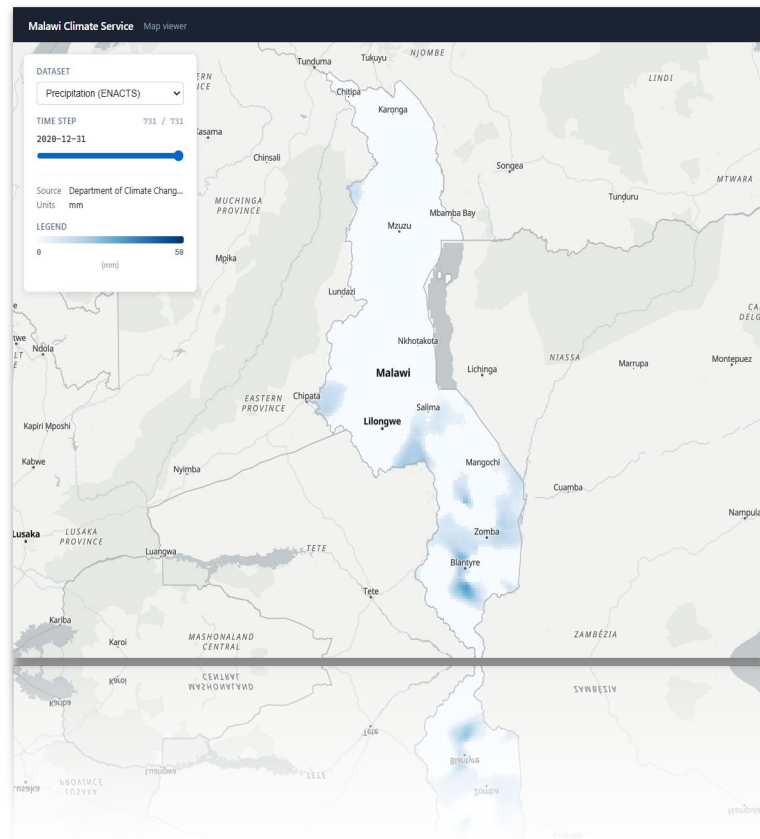
Malawi Climate Portal



ENACTS Integration – Anchoring in Local Data

Bridging Global Tools with Malawi's Ground Reality

- **The Integration:** The Open Climate Service is seamlessly connected with the **ENACTS Data Sharing Tool (DST)**
- **Localized Insights:** Direct access to high-resolution, quality-controlled historical climate data recorded on the ground by Malawi's Department of Climate Change and Meteorological Services (DCCMS).
- **Why It Matters:** Moving past coarse global models to utilize localized data that reflects the actual microclimates and weather realities of Malawi's districts.



Climate Projections & The Climate Portal

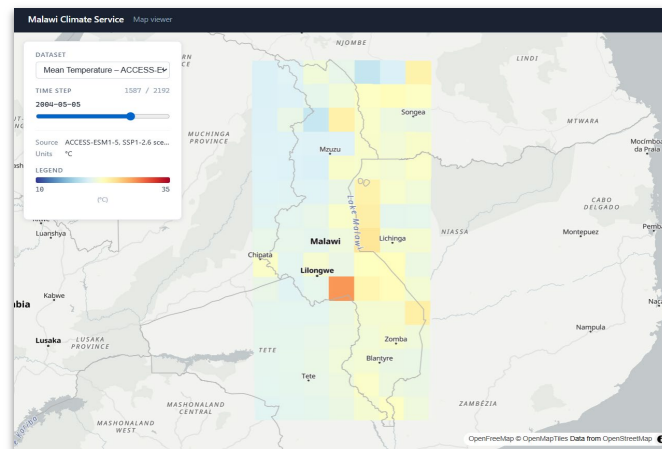
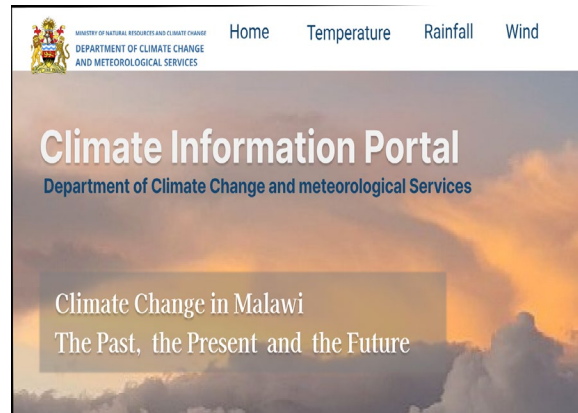


Powering Future Insights via DHIS2 and the Climate Portal

What is a Climate Portal?

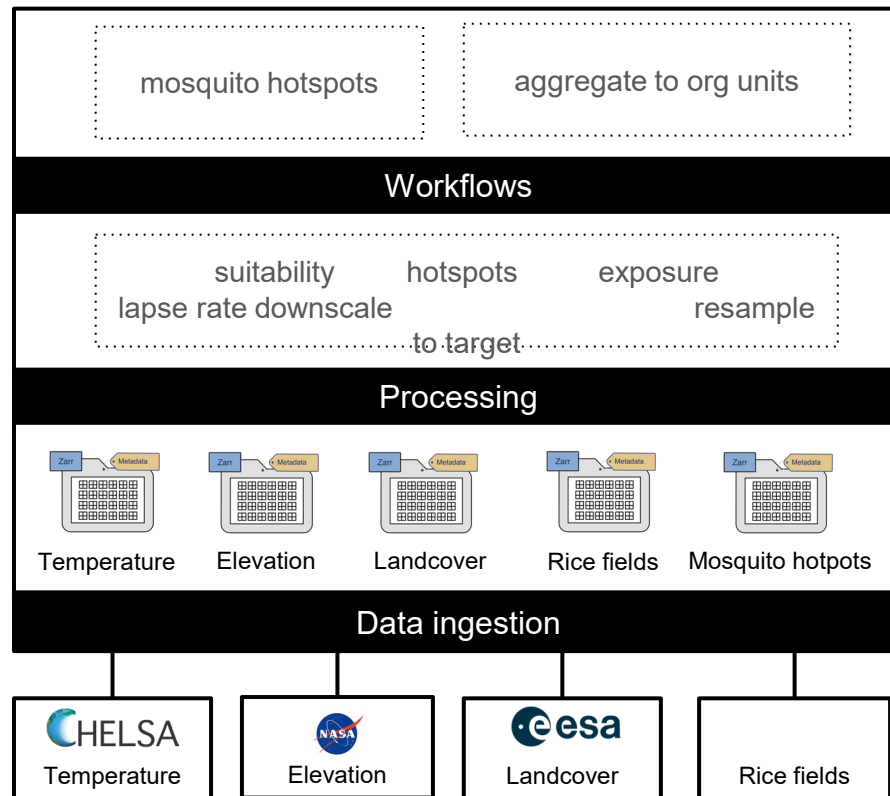
A centralized digital platform that translates complex climate science into accessible maps, graphs, and datasets, allowing decision-makers to visualize future climate risks.

- **The Backend Engine:** The Open Climate Service acts as the invisible powerhouse, driving data directly into Malawi's Climate Portal.
- **The Core Fusion:** By combining local historical data (via the ENACTS DST) with robust **future climate projections**, the open climate service calculates specialized climate indices (e.g., dry spell durations, extreme rainfall thresholds).
- **Cross-Sector Accessibility:** These actionable indices are delivered straight to stakeholders through two primary channels:
 - **The Climate Portal:** For environmental, agricultural, and policy planners.
 - **The DHIS2 Climate App:** Embedding climate intelligence directly into health sector workflows to predict and manage climate-sensitive health risks.

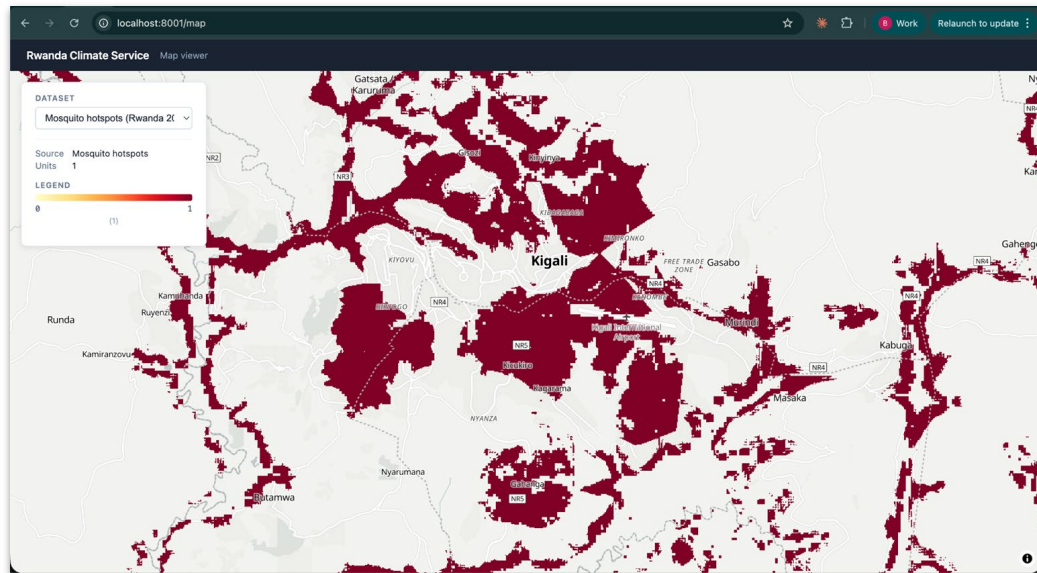




Rwanda Climate Service

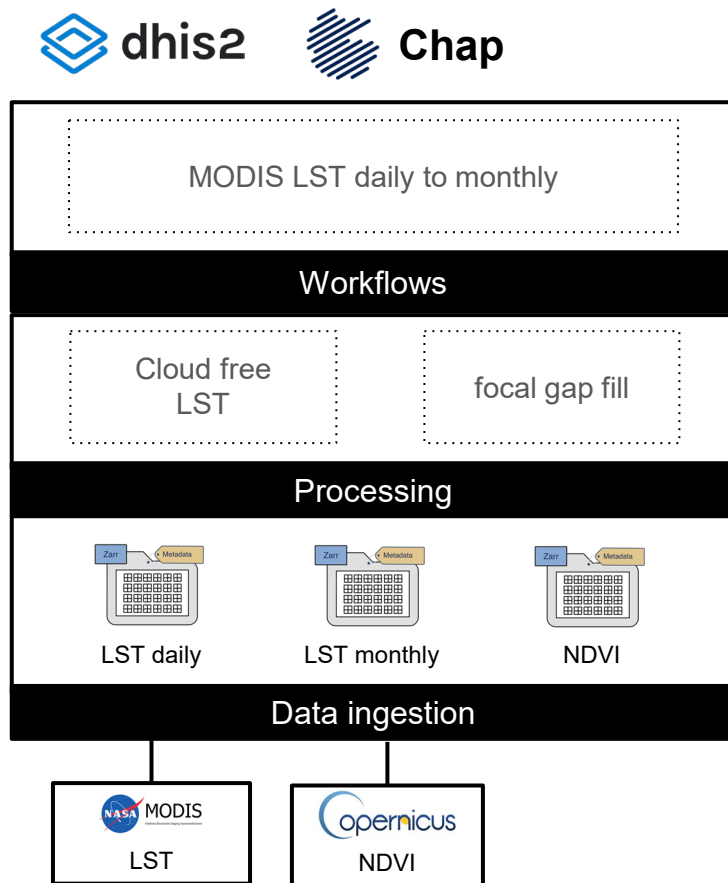


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University of Oslo

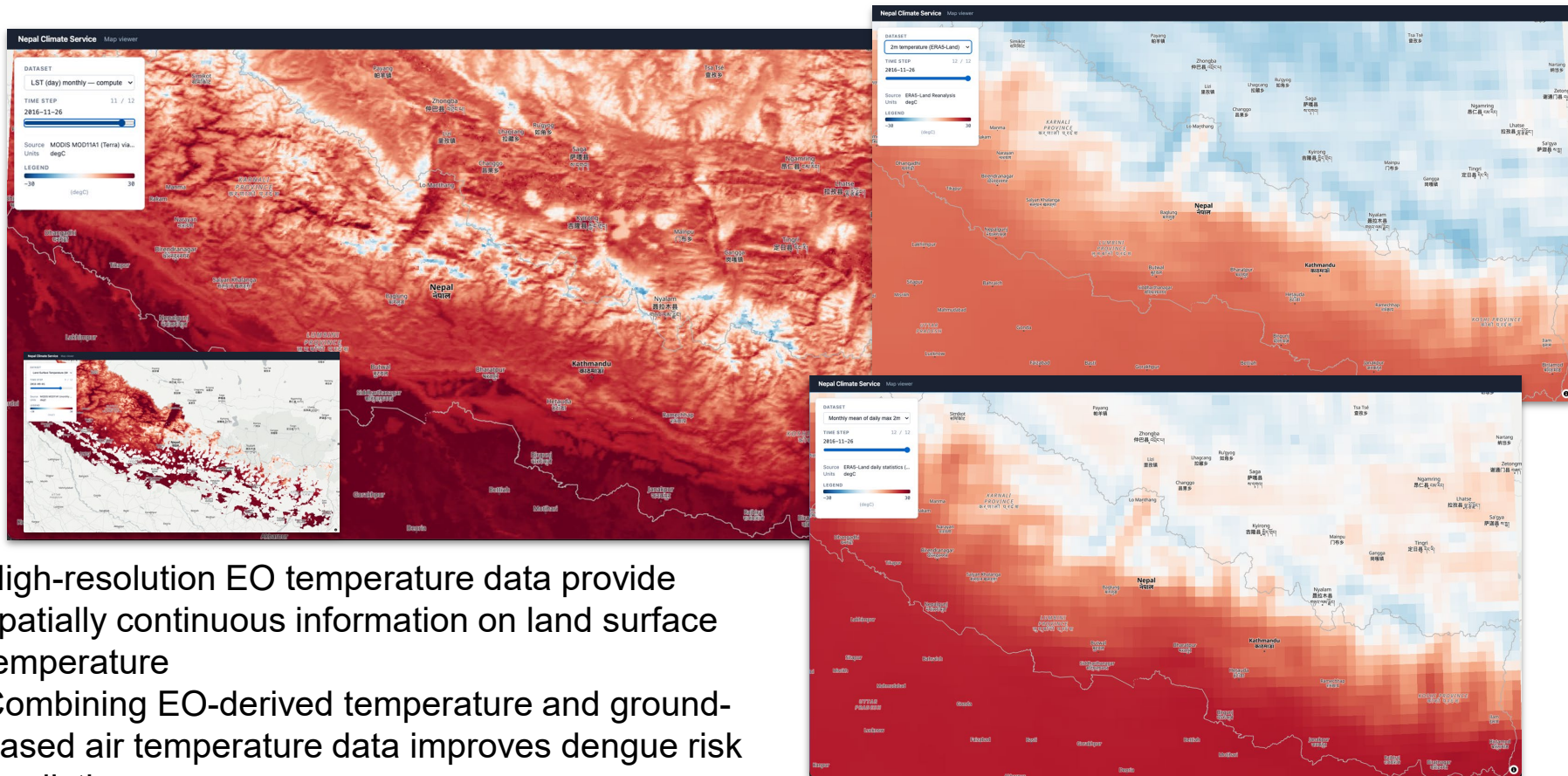


Nepal Climate Service

LST = Land Surface Temperature
NDVI = Normalized Difference Vegetation Index



Nepal Climate Service

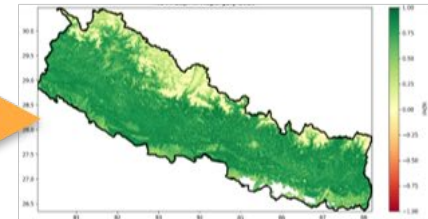
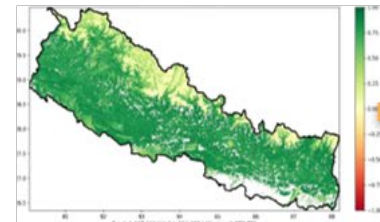
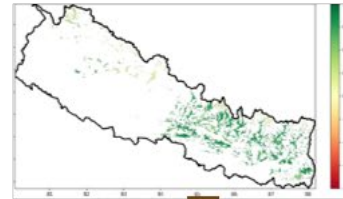


High-resolution EO temperature data provide spatially continuous information on land surface temperature

Combining EO-derived temperature and ground-based air temperature data improves dengue risk prediction

Data gap issues in EO Data (example of NDVI)

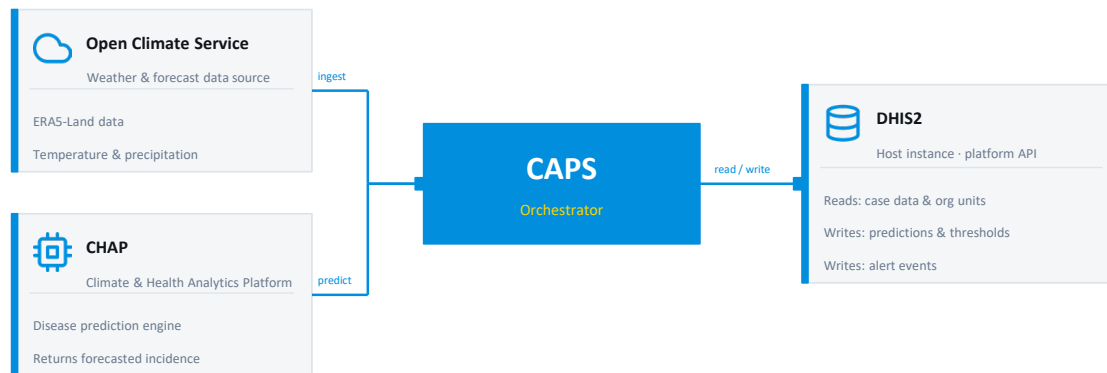
- ❑ EO data provide high spatial and temporal resolution, enabling continuous monitoring of heterogeneous landscapes and improving the accuracy of predictive models over the coarse global climate data



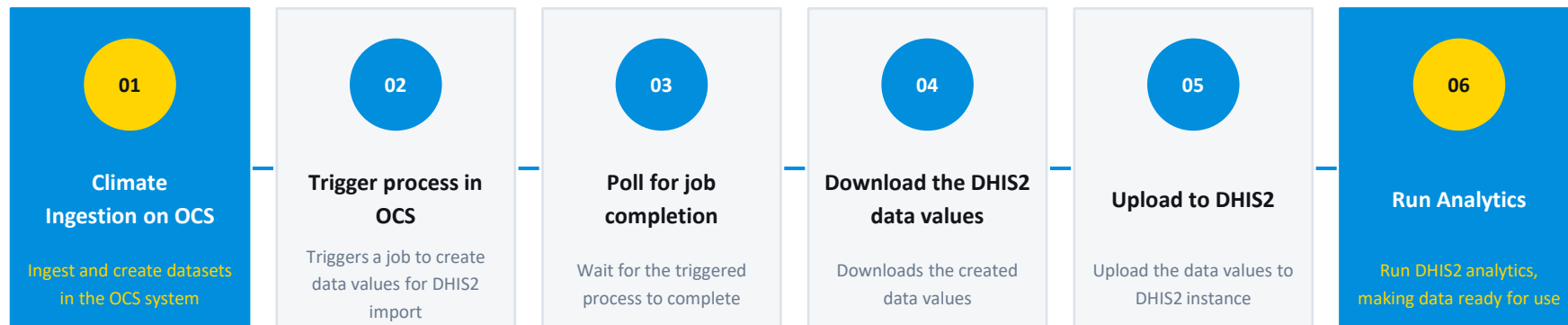
- ❑ Understanding seasonal cloud-cover patterns, data-gap dynamics, and appropriate gap-filling techniques is essential before utilizing EO data for analysis and modeling.

Automating Open Climate Service with CAPS

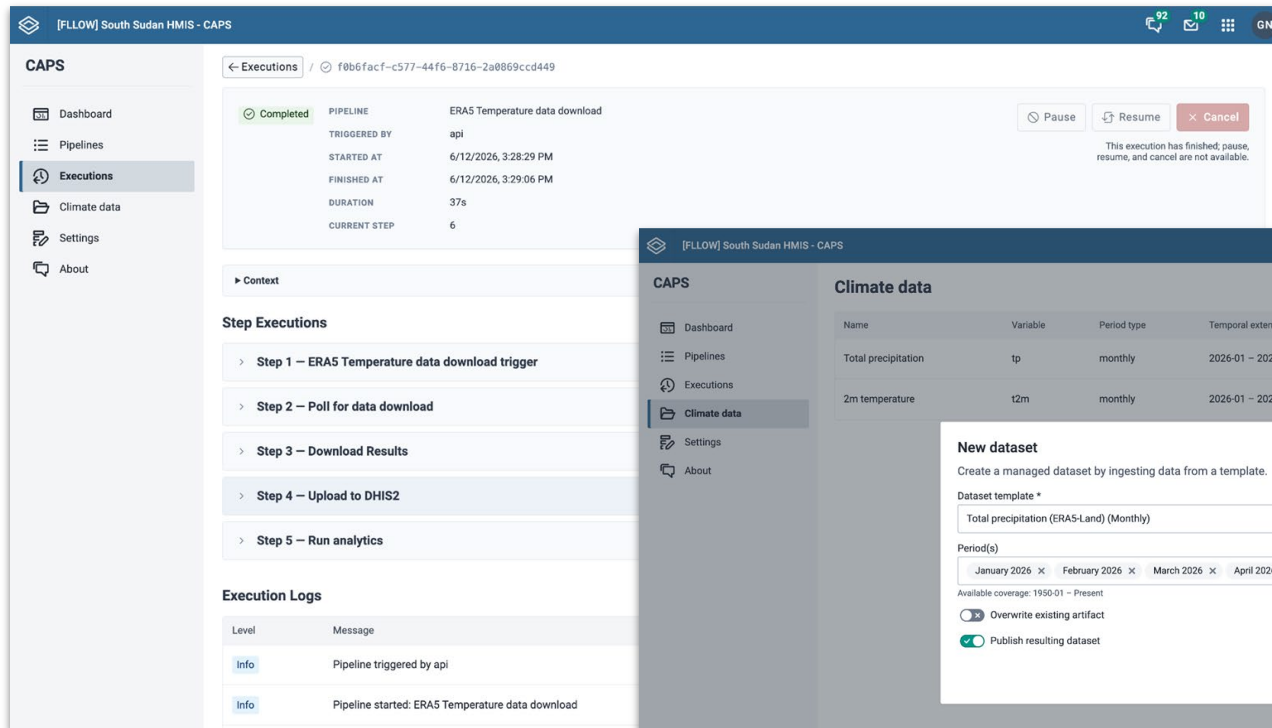
CAPS orchestrates three external systems. Lines show data flow direction.



Climate data ingestion automation in CAPS is done in 6 steps



Automating Open Climate Service with CAPS



The image displays two overlapping screenshots of the CAPS (Climate Automated Pipelines Service) interface. The background screenshot shows the 'Executions' page for a pipeline named 'ERAS Temperature data download'. The pipeline is marked as 'Completed' and shows details such as 'Triggered by: api', 'Started at: 6/12/2026, 3:28:29 PM', 'Finished at: 6/12/2026, 3:29:06 PM', 'Duration: 37s', and 'Current step: 6'. The foreground screenshot shows the 'Climate data' page, which lists two datasets: 'Total precipitation' (variable 'tp', monthly, 2026-01 - 2026-05) and '2m temperature' (variable 't2m', monthly, 2026-01 - 2026-05). Both datasets are marked as 'Published'. A 'New dataset' modal is open, showing options to create a managed dataset by ingesting data from a template, with the selected template being 'Total precipitation (ERAS-Land) (Monthly)'. The modal also shows the period selection (January 2026 to May 2026) and options to 'Overwrite existing artifact' and 'Publish resulting dataset'.

CAPS [FOLLOW] South Sudan HMIS - CAPS

Executions

← Executions / f0b6facf-c577-44f6-8716-2a869ccd449

Completed

PIPELINE: ERAS Temperature data download

TRIGGERED BY: api

STARTED AT: 6/12/2026, 3:28:29 PM

FINISHED AT: 6/12/2026, 3:29:06 PM

DURATION: 37s

CURRENT STEP: 6

Pause Resume Cancel

This execution has finished; pause, resume, and cancel are not available.

Context

Step Executions

- Step 1 – ERAS Temperature data download trigger
- Step 2 – Poll for data download
- Step 3 – Download Results
- Step 4 – Upload to DHIS2
- Step 5 – Run analytics

Execution Logs

Level	Message
Info	Pipeline triggered by api
Info	Pipeline started: ERAS Temperature data download

CAPS [FOLLOW] South Sudan HMIS - CAPS

Climate data

Name	Variable	Period type	Temporal extent	Last updated	Publication	Actions
Total precipitation	tp	monthly	2026-01 – 2026-05	6/11/2026, 11:16:13 AM	Published	...
2m temperature	t2m	monthly	2026-01 – 2026-05	6/11/2026, 11:19:12 AM	Published	...

New dataset

Create a managed dataset by ingesting data from a template.

Dataset template *

Total precipitation (ERAS-Land) (Monthly)

Period(s)

January 2026 x February 2026 x March 2026 x April 2026 x May 2026 x 2026

Available coverage: 1950-01 – Present

☐ Overwrite existing artifact

☒ Publish resulting dataset

Cancel Start ingestion

Open Climate Service Roadmap



Stability

DHIS2 and Chap integration

Security and authentication

Performance and scalability

Automation and scheduling

More datasets, processing and workflows

Building competence and partnerships

Open Climate Service Testing



Open Climate Service is *not* ready for production, but we encourage you to try it out.

The service will only be successful if we are able to meet your use cases, and if you are able to do the tailoring required for your target user group.

Start today by joining our the Open Climate Service Hands-on session 15-17.



Questions and feedback

