

Catchment-level water resource accounts: a quick overview

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Outline of presentation

- Water accounting frameworks
- Scope and approach of water resource accounts
- Production of water resource accounts
- Pilot accounts for Ecological Infrastructure for Water Security Project
- Water resource account tables and visualisation of information
- Vision
- Managing expectations
- How can the information be used & when will it be available

Water accounting frameworks

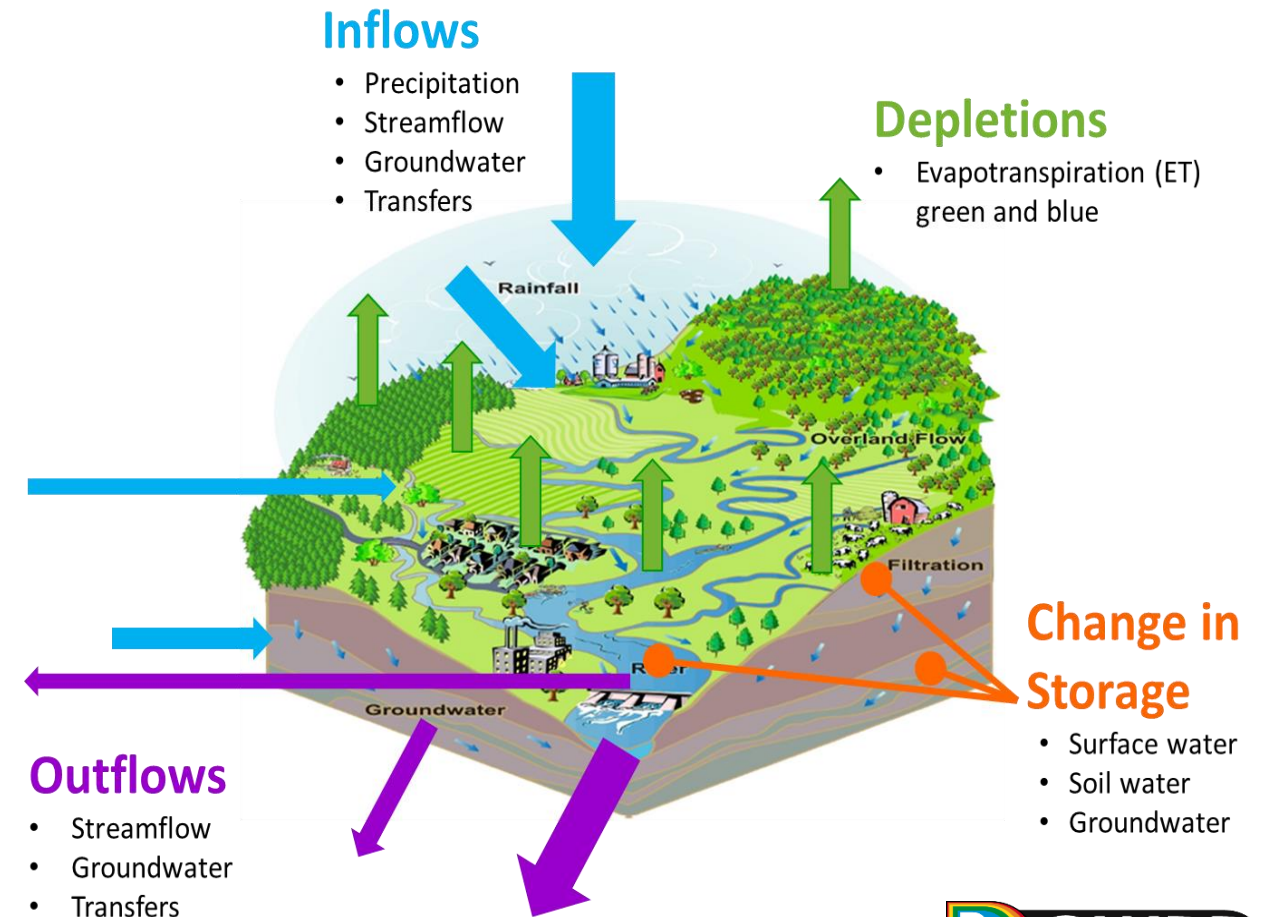
Water accounts are “An analytical framework within which stocks, flows and consumption of water are quantified within a defined spatial and temporal domain”

- **SEEA-Water (National Water Accounts)**

- Physical & economic focus – national level for policy
- Measures: use of water resources by the economy & the impact of the economy on water resources

- **WA+ (Water Resource Accounts)**

- Physical accounts at catchment scale
- Land and water management emphasis
- Bigger picture than traditional engineering view



Scope and approach of water resource accounts



- **Spatial Scale (Accounting Area)**

- Quaternary Catchments
- Aggregate these up to Tertiary, Secondary, Primary, National

- **Time Scale**

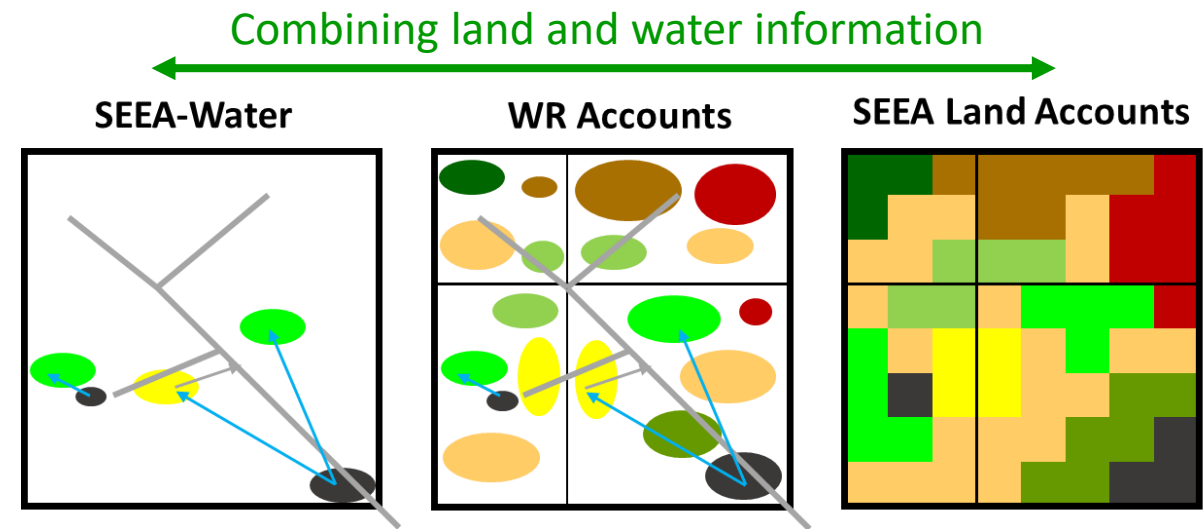
- Annual (hydrological, calendar, economic)
- Seasonal, monthly?

- **Approach**

- Measurements and modelling
- Land cover/use focus

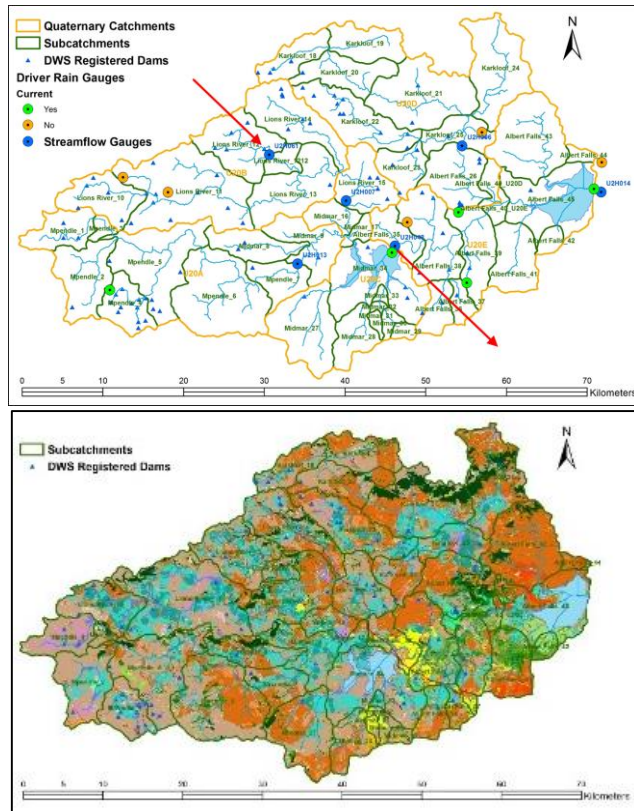
- **Niche**

- Complement SEDA
- Catchment water resources view
- Management tool



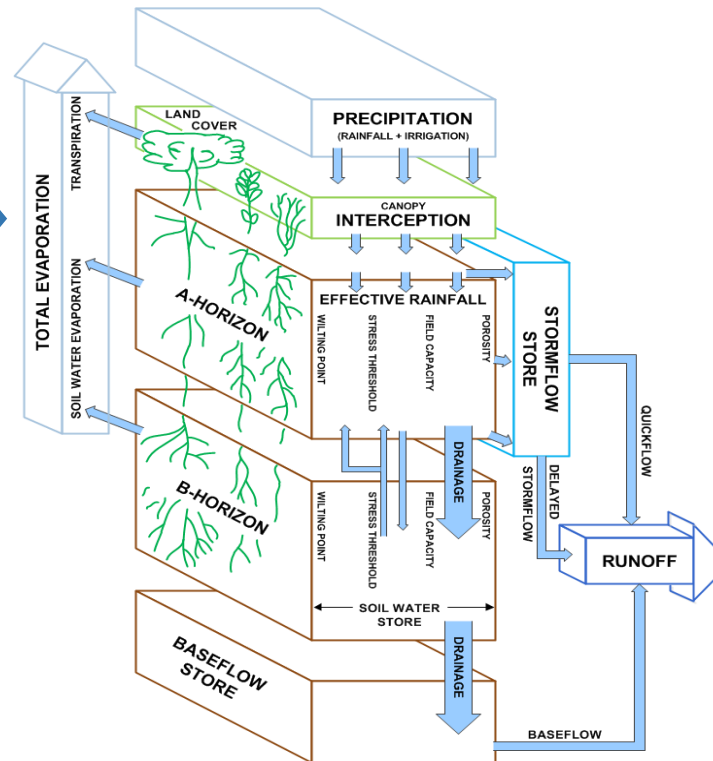
Production of water resource accounts

Data



- Topography
- Climate
- Land cover/use
- Soils
- Dams
- Population
- Transfers

Modelling

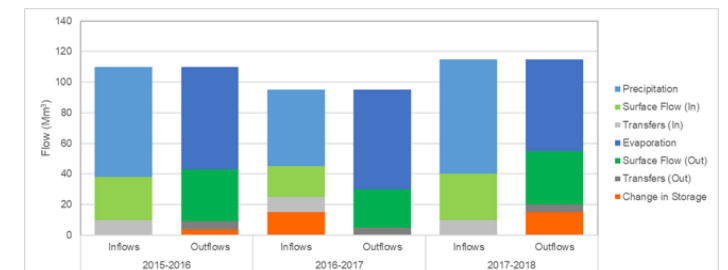


- Infiltration
- Evaporation
- Runoff
- Recharge
- Baseflow
- Streamflow
- Crop requirements

Accounts

[illegible]

Visualisation



Ecological Infrastructure for Water Security (EI4WS) Project

- A five-year, multi-stakeholder project
- To unlock development finance to secure ecological infrastructure for water security in two critical catchments.

ECOLOGICAL INFRASTRUCTURE FOR **WATER SECURITY**

Unlocking development finance to secure ecological infrastructure for water security in critical water catchments

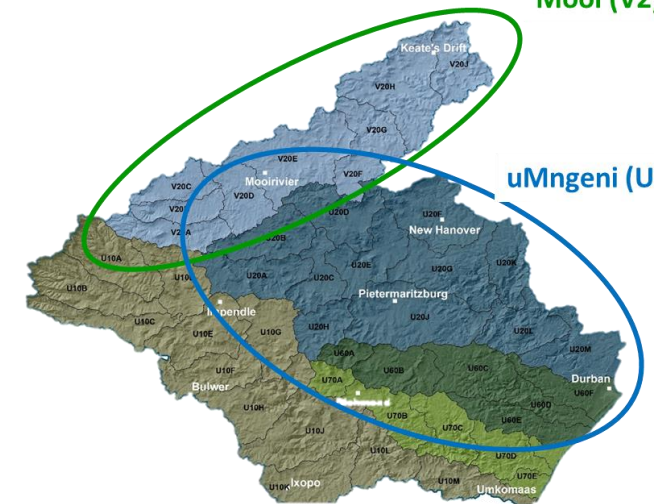


Berg-Breede
demonstration catchment

Greater uMngeni
demonstration catchment

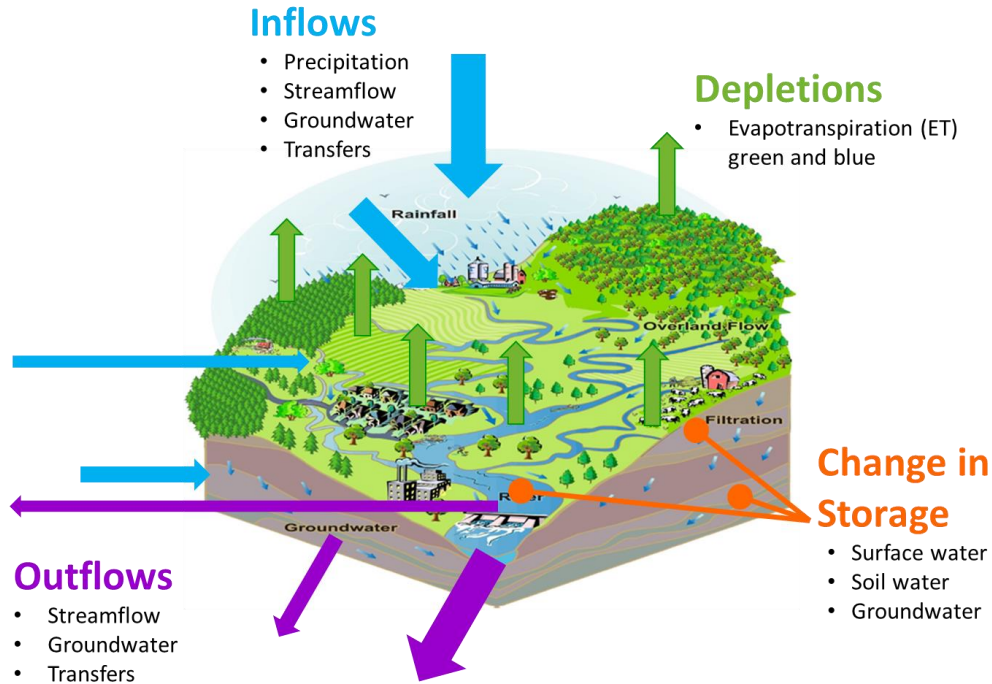
Mooi (V2)

uMngeni (U2)



Water resource account table

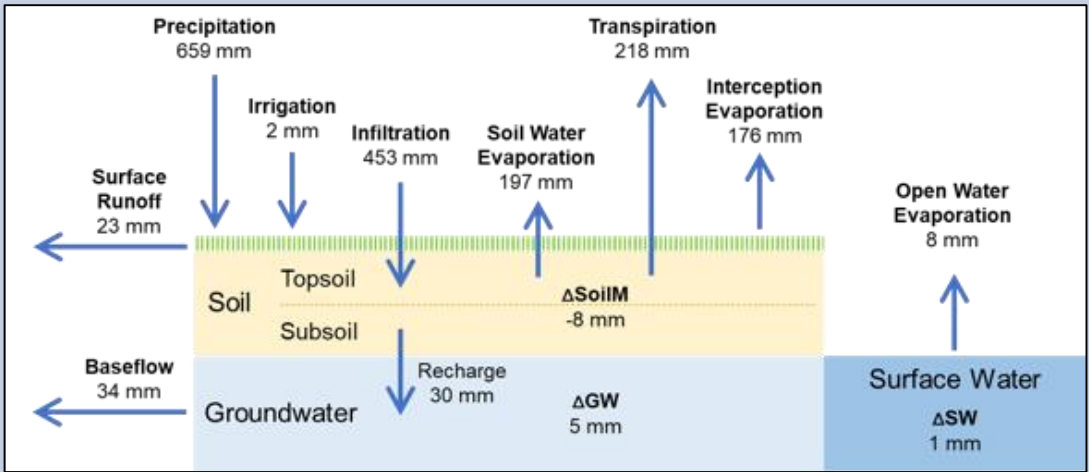
Components of stocks, flows and consumption of water captured in water resource accounts are illustrated in diagram below:



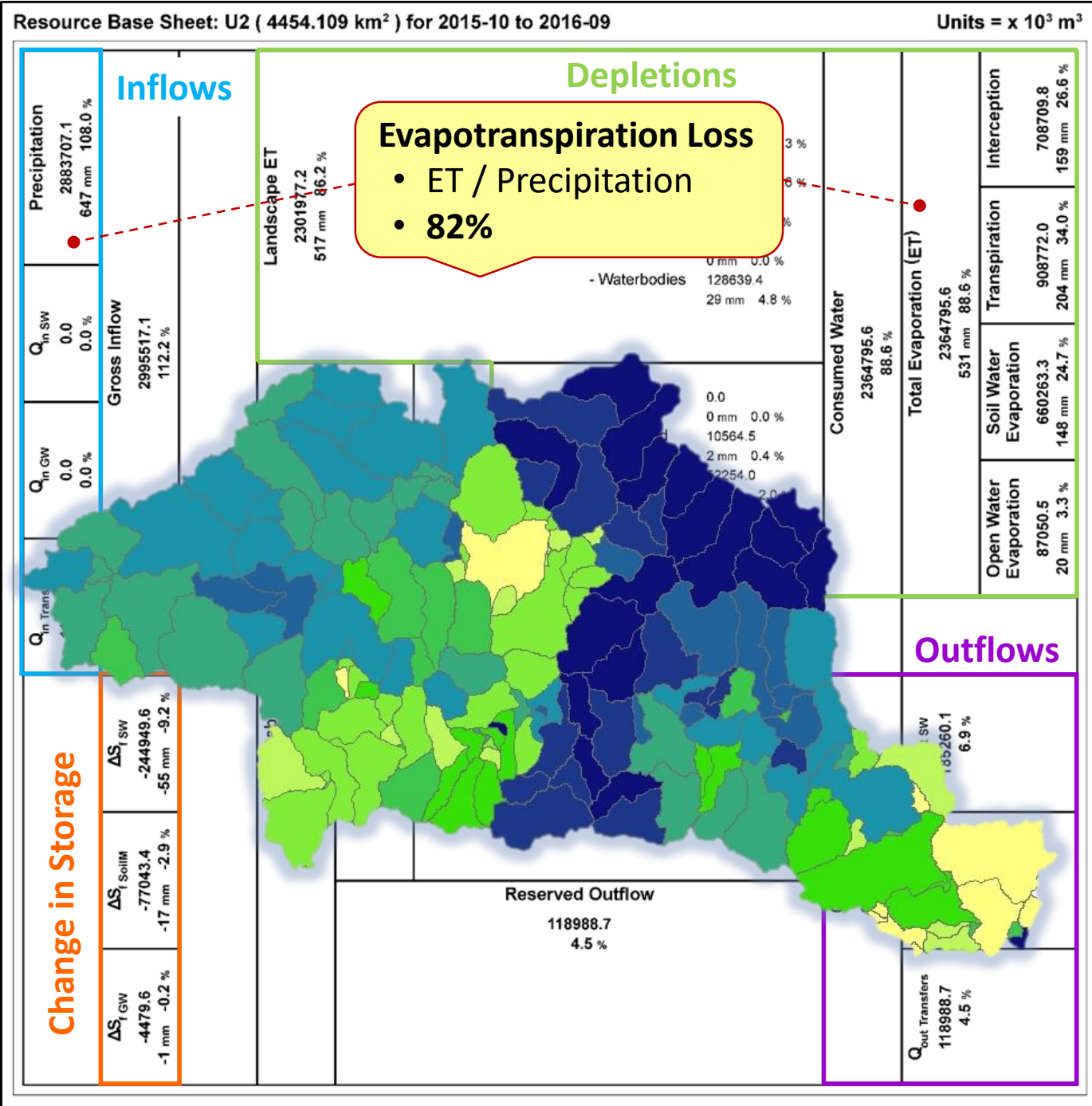
Resource Base Sheet: uMngeni 2015-2016

| Resource Base Sheet: U2 (4454.109 km ²) for 2015-10 to 2016-09 | | | | | | Units = x 10 ³ m ³ | |
|---|-----------------|-------------------------|--|---------------------------|-----------------|--|--|
| Change in Storage | ΔS_{GW} | -4479.6 -1 mm -0.2 % | ΔS_{SoilM} | -77043.4 -17 mm -2.9 % | ΔS_{SW} | -244949.6 -55 mm -9.2 % | |
| | | | | | | Net Inflow 2569044.5 100.0 % | |
| | | | | | | | |
| | | | | | | | |
| Exploitable Water 367067.3 13.8 % | | | Landscape ET 2301977.2 517 mm 86.2 % | | | | |
| Available Water 248078.6 9.3 % | | | Utilized Flow 62818.4 2.4 % | | | | |
| Reserved Outflow 118988.7 4.5 % | | | Incremental ET 62818.4 14 mm 2.4 % | | | Non-recoverable Flow 0.0 0.0 % | |
| | | | | | | | |
| Utilizable Outflow 185260.1 6.9 % | | | Consumed Water 2364795.6 88.6 % | | | | |
| Outflow 304248.9 11.4 % | | | Total Evaporation (ET) 2364795.6 531 mm 88.6 % | | | | |
| $Q_{out\ Transfers}$ 118988.7 4.5 % | | | $Q_{out\ GW}$ 0.0 0.0 % | | | $Q_{out\ SW}$ 185260.1 6.9 % | |
| | | | Open Water Evaporation 87050.5 20 mm 3.3 % | | | Interception 708709.8 159 mm 26.6 % | |
| | | | Soil Water Evaporation 660263.3 148 mm 24.7 % | | | Transpiration 908772.0 204 mm 34.0 % | |
| | | | | | | | |

Water resource account visualisation

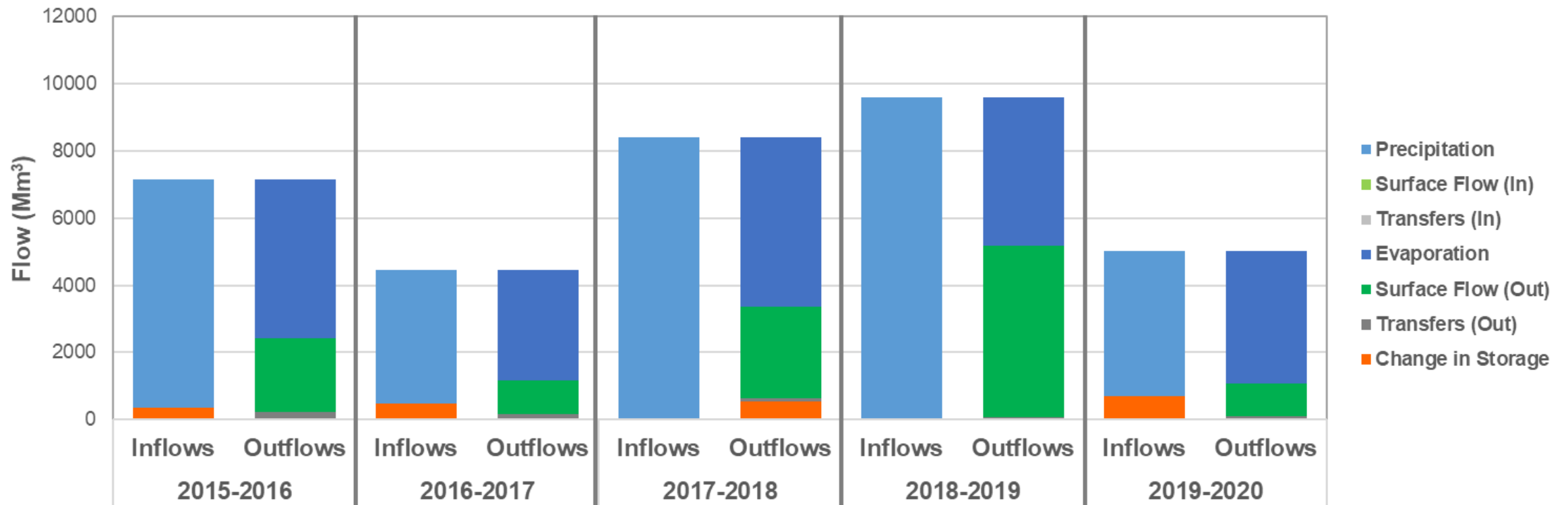


Resource Base Sheet: uMngeni 2015-2016



Time series of Water Balances

Breede River Catchment

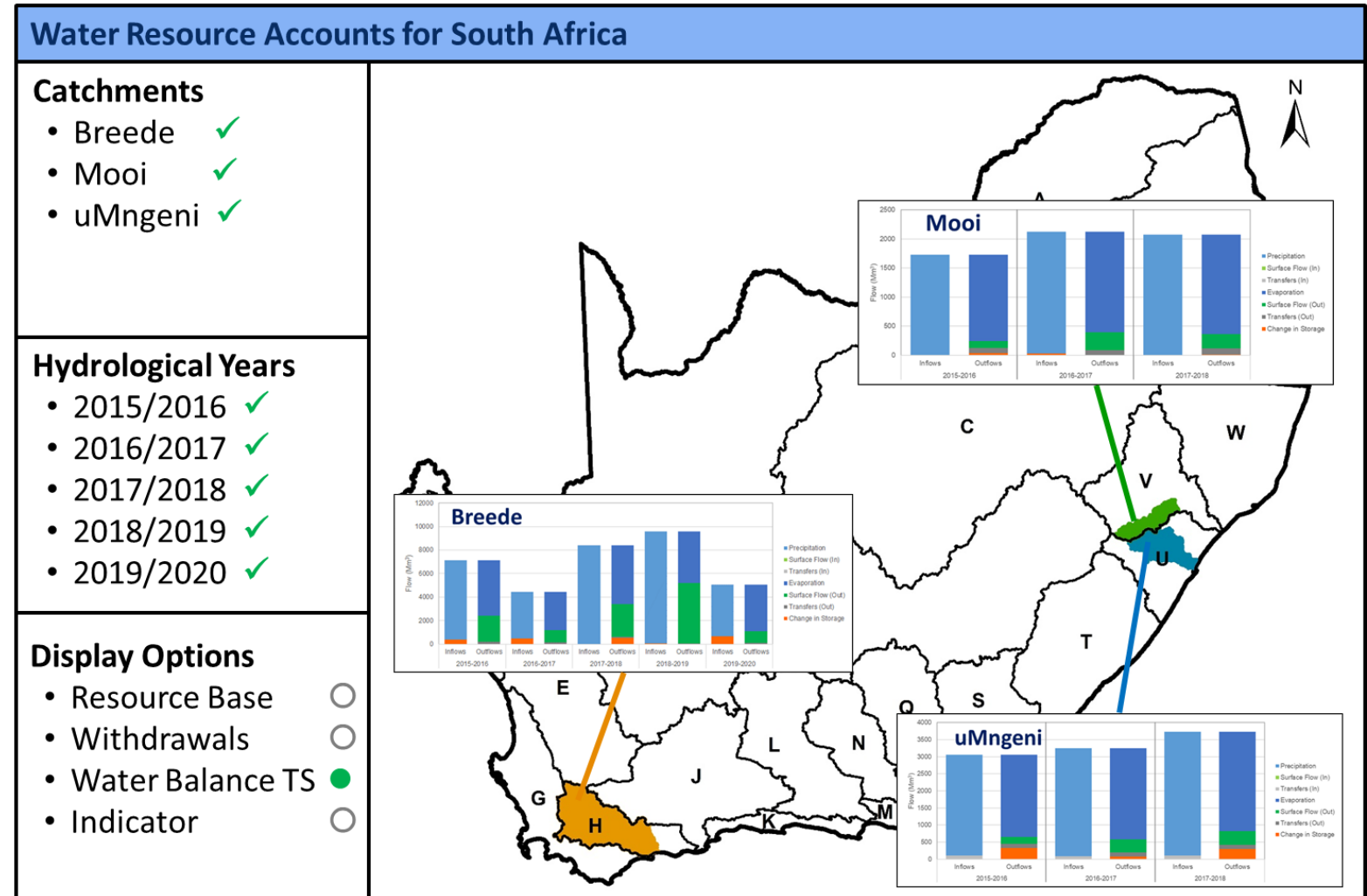


Vision for water resource accounts

Water Resource Accounts for whole country, at Quaternary Catchment scale, annually

Providing:

- Holistic landscape integrated/system view of water resources
- Annual, standardized WR estimates at a range of catchment scales (statistics, indicators, maps)

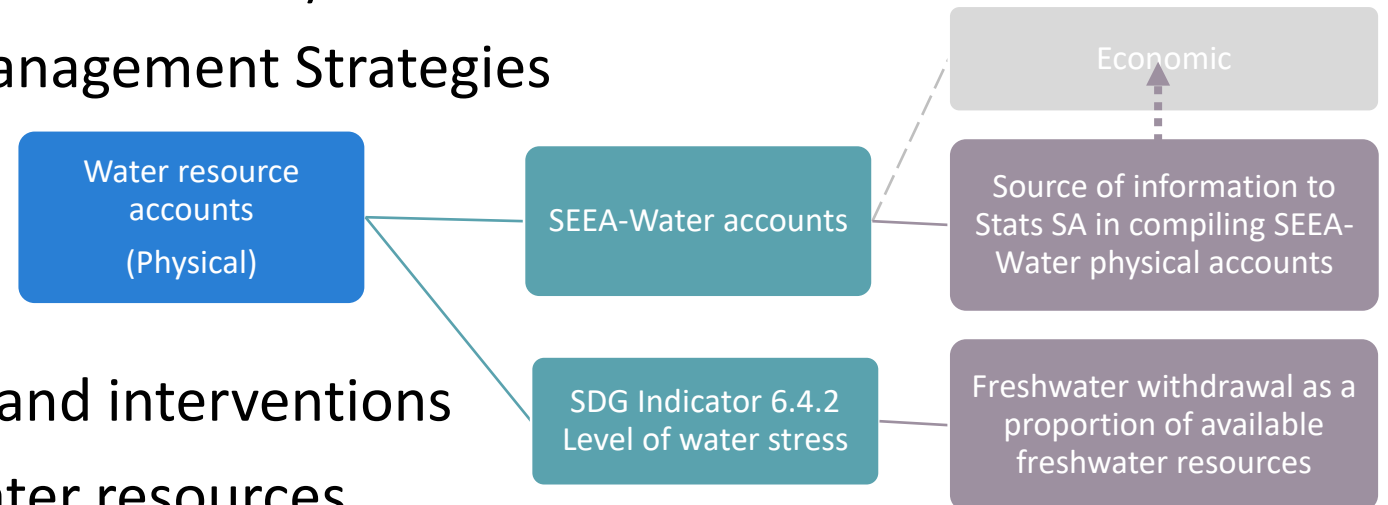
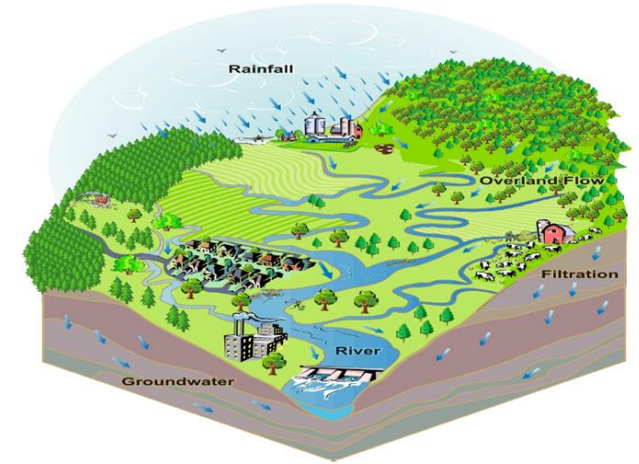


Managing expectations

- **Historical or current state perspective:** Not forecasts (though the modelling approach enables this)
- **Represent a point in time or short duration (e.g. a year):** Not long-term means/medians
- **Modelled estimates combined with some measurements:** Not intended for water auditing
- **Catchment scale:** Finer scale than national SEEA-Water accounts (different role) but not at scale of ecological infrastructure features
- **Physical accounts:** Biophysical quantities (not economic) and just for water quantity for now (recognise that water quality is important)
- **Pilot catchments:** further investment and institutional ownership needed to realise the vision and potential value of water resource accounts.

How can information from these accounts be used?

- A tool for supporting integrated water resources management at catchment level
 - Promoting better and more multidisciplinary understanding of water resource systems at different scales, from source to sea, with a different viewpoint to traditional engineering focused water resources planning assessments
 - They help managers in understanding how the water resources, terrestrial parts of catchments, and the economy are linked.
- Inform policy e.g. Catchment Management Strategies
- Source of physical information:
- Prioritize additional monitoring and interventions
- Increase public awareness of water resources



THANK YOU



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