

# uMhlathuze Catchment Monitoring and Management

Mhlathuze Water 11 March 2019

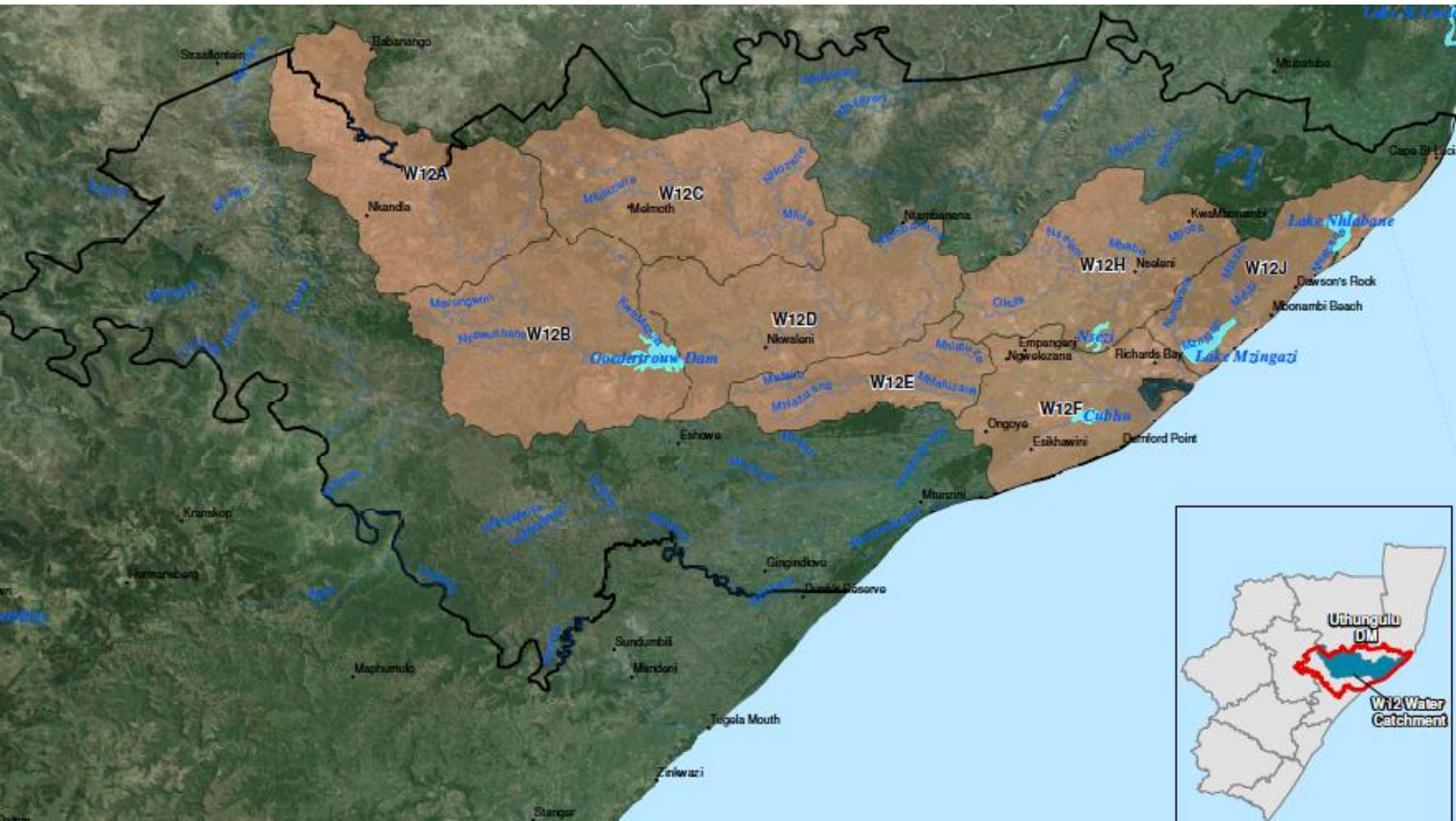


## UWASP

uMhlathuze Water Stewardship Partnership







# A partnership was catalysed by a major drought in 2016, and the need for a collective response



The major dam serving the uMhlathuze region, at 18% capacity in August 2016:



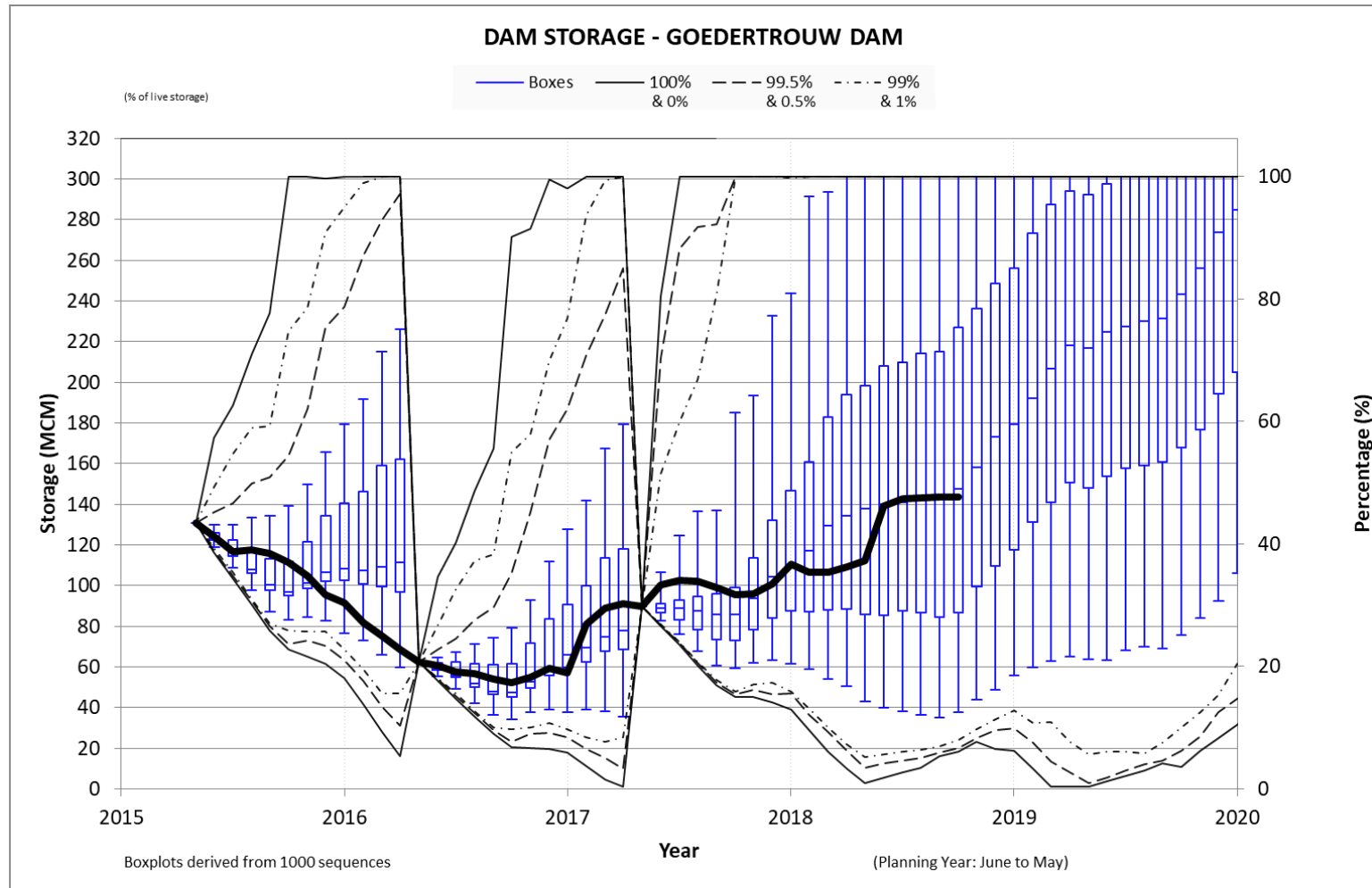
Photo Credit: Alex McNamara, NBI  
Goudertrouw Dam, August 2016



# Field trip – August 2016



**The risk of drought is increasing.  
Collective action is needed. Water stewardship is a  
meaningful part of this journey.**



# UWASP

uMhlathuze Water Stewardship Partnership

A partnership  
between:



water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

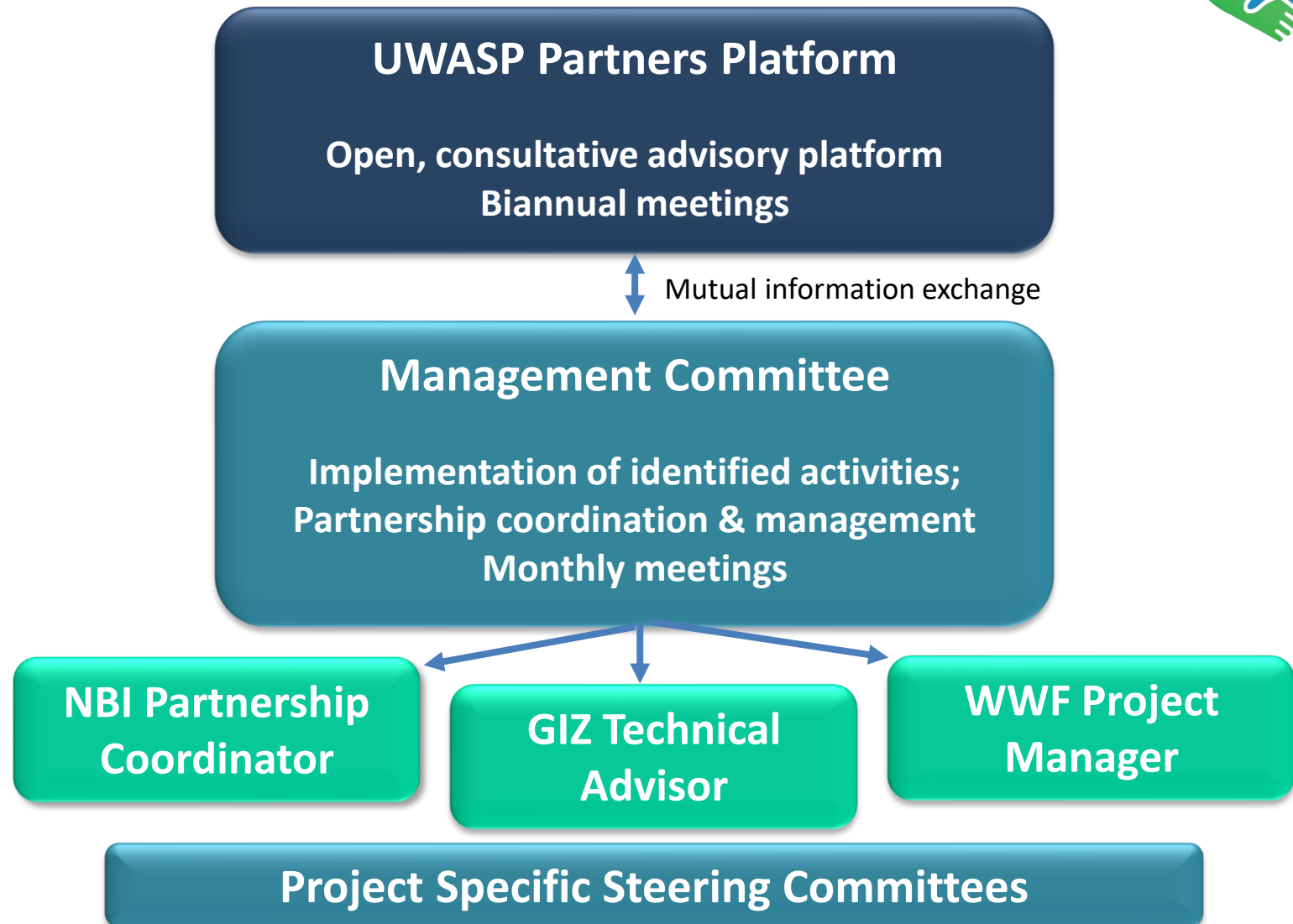


Pongola-Umzimkulu Proto-CMA



2018/9:  
City of uMhlathuze  
South32  
Mhlathuze Water

# UWASP has an established governance structure that supports your participation



# UWASP has five work areas, as agreed by the partners:



1

Enhanced coastal lakes management & dam mentorship programme

Lead: NBI  
Support: IWaSP

2

Downstream water-use efficiency & water losses

Lead: IWaSP  
Support: SWPN

3

Agricultural water stewardship & efficiency

Lead: WWF-Mondi  
Support: SASA & Tongaat Hulett

4

Ecological infrastructure: invasive clearing and wetlands

Lead: WWF-Mondi  
Support: uMhlathuze Irrigators Forum

5

Cross-cutting: develop local community environmental champions



# Partnership objectives



1. Serve as a **coordination** hub for collective action on water security across the uMhlathuze region
2. **Collaborate** with all key stakeholders and water users in the region
3. Implement **short and medium-term measures** to improve water security for industry, agriculture and communities
4. Use water as a focal point **for transformation and economic development** to strengthen resilience and adaptive capacity
5. Work with public sector institutions to support improved **service delivery** and natural resource **management**

# Why are we here?





# Management of dam releases



# Contents



1. Why train a varied group of people
2. Why the flows and releases need constant monitoring and adjustment
3. The weather and sources of information
4. The effect of rainfall and duration of river flow
5. Timing the shutoff and new releases
6. How long does it take for the change to be felt.
7. The way forward

# Why train a varied group?



1. It is important that stakeholders have an understanding of the dynamics of their catchment so that they can give meaningful input especially during drought periods but also so that they can assist in advising on future improvements and developments.
2. To train a group of affected stakeholders to assist in managing a resource which supplies their water needs.
3. Training a group is important for continuity

# Why flows and releases need constant monitoring



1. Demands from the system are varying, especially Irrigation needs.
2. Heat waves and wind not only affect demand, but also evaporation from the river surface.
3. Natural river flow drops steadily after a flood peak
4. Unexpected rainfall from some point within the catchment can cause levels to rise.



# How to monitor the flows and rainfall effectively



1. A group of people at different points in the catchment can monitor flows more effectively and economically.
2. The key is to establish relationships and keep everyone involved and informed.
3. The Mhlathuze Whatsapp group has been an effective tool, but there may be room for improvement.
4. There is a daily report of the level and pumped volume at Mhlathuze weir as well as the level at P230 weir and pumping rate.
5. We need a tool to monitor the lake levels on a weekly basis and standard measure such as live volume & percent

# The weather and sources of information



1. Weather can be sourced from many websites, from the TV and from people on the ground
2. People on the ground can also give rainfall figures afterward to confirm if the forecast came to pass
3. It is good to look up to 10 days ahead, so that release changes can be anticipated and modelled, but rain, especially if it is forecast to be localised can disappear before the time or arrive a day or two late
4. [https://www.yr.no/place/South\\_Africa/KwaZulu-Natal/Heatonville/](https://www.yr.no/place/South_Africa/KwaZulu-Natal/Heatonville/) or <https://www.wunderground.com/weather/za/empangeni/-28.75%2C31.88999939> are two I use. Windguru is favoured by some
5. Yr underestimates rain and wunderground overestimates, but when they confirm each other with high rainfall, it is fairly reliable.

# The effect of rainfall and duration of flow



1. Light rain, especially after a dry spell is not important. Irrigation normally continues and river levels do not rise, as it soaks into the ground
2. Follow-up rain when the catchment is wet, on the other hand, can have a significant effect on river levels and Irrigation demand. Judging this requires experience. Hopefully a group decision will provide a more accurate assessment, but we all get it wrong sometimes, just like the weatherman.
3. It is also important that stakeholders have an understanding of the dynamics of their catchment and contacts within the catchment.



# Timing the shutoff and new releases



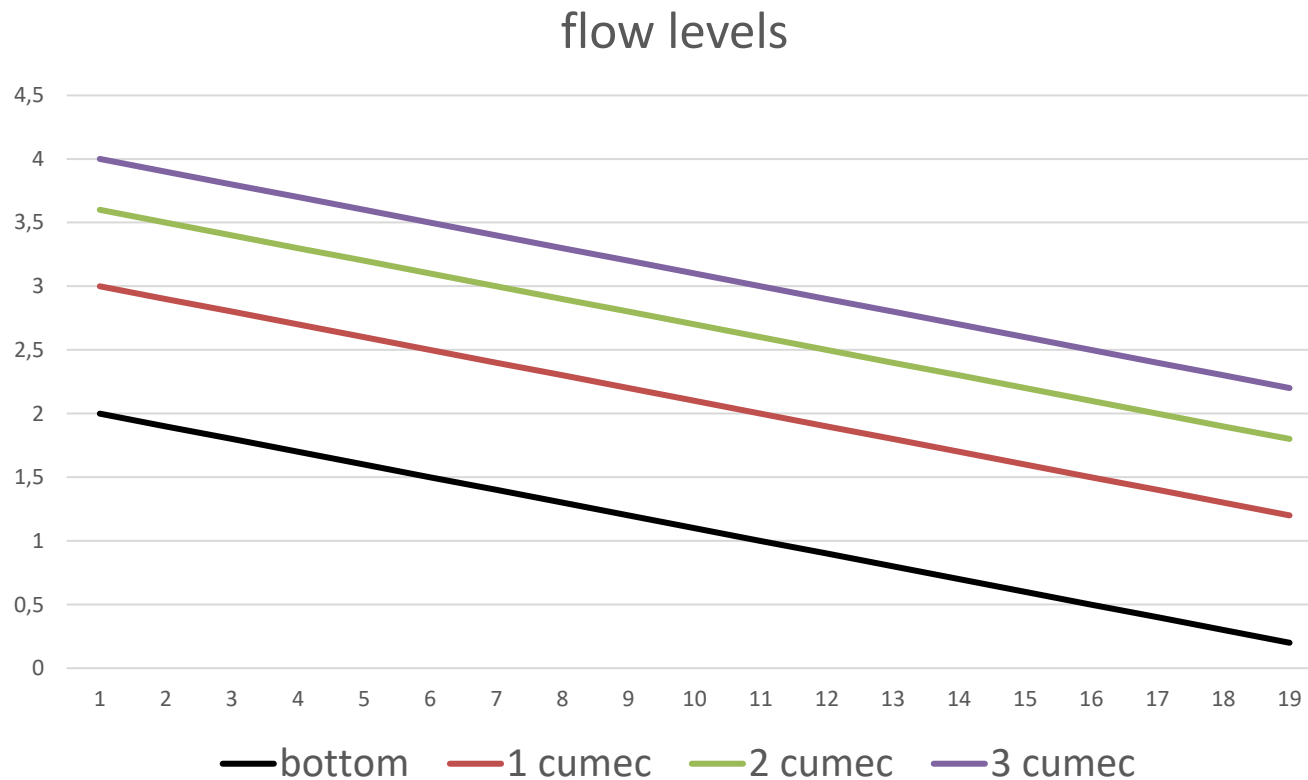
1. To save water, flows should be reduced before rainfall so as to drop the river level on the day that the rain arrives at the Mhlathuze weir, but not too soon.
2. Flows should not be cut too much unless a large storm is expected. Judging this requires experience.
3. Afterward flow should be gradually increased before the river flow drops completely, as a dry river bed will delay the flow and cause shortage of supply.
4. Gradual stepped increases are also easier to model and thus more accurate.

# Travel times in a river system and how they vary

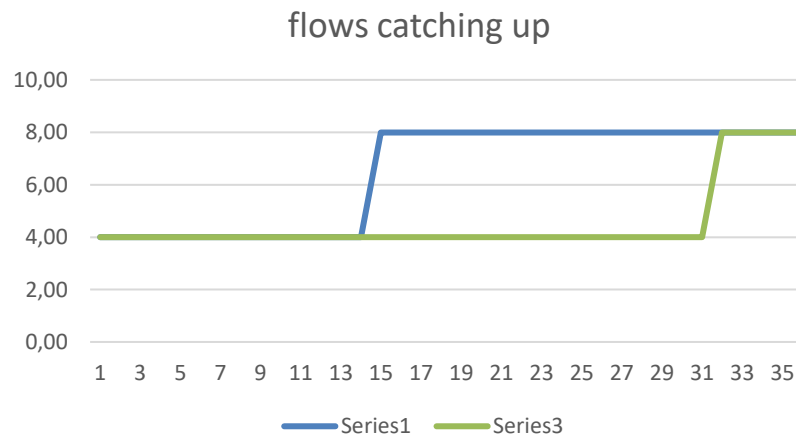
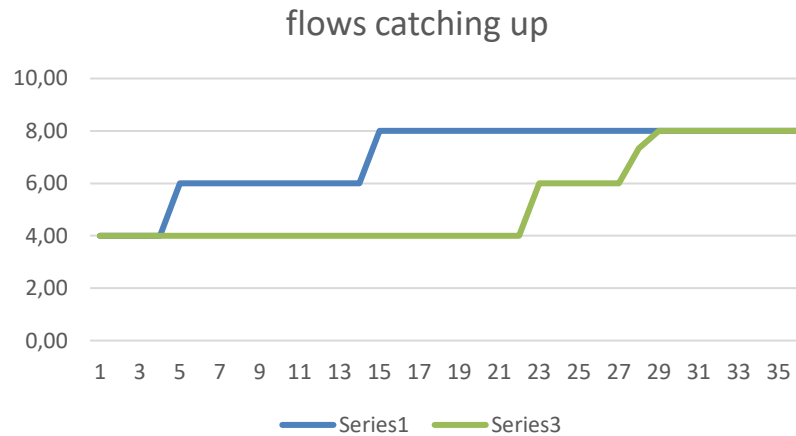


1. Water takes very long to fill a dry river bed.
2. Small flows flow slowly and bigger flows are faster.
3. An increase in top of a small flow travels even faster than a big flow in a dry river.
4. You can catch up for a late release with a bigger release over 24 hours, but it will not save more than a quarter of the time.

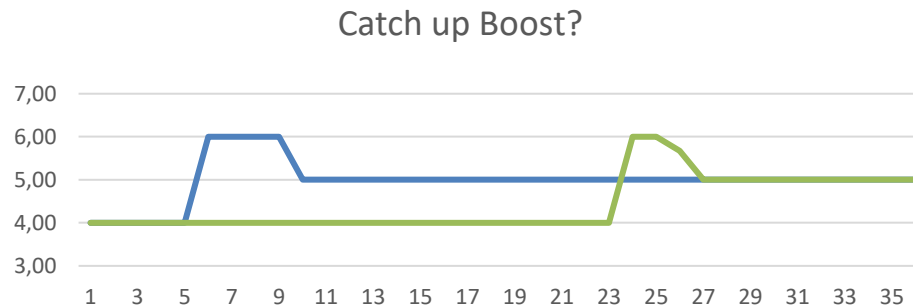
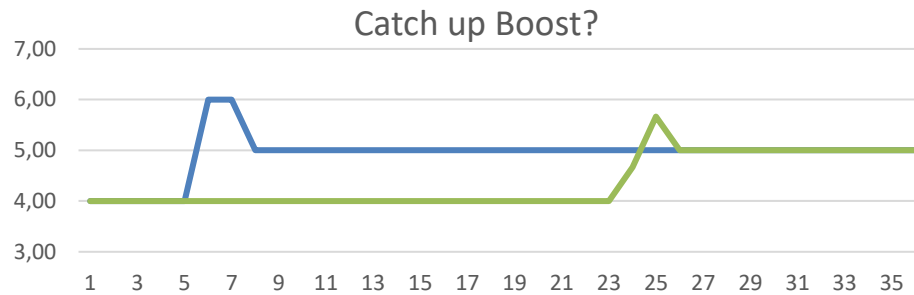
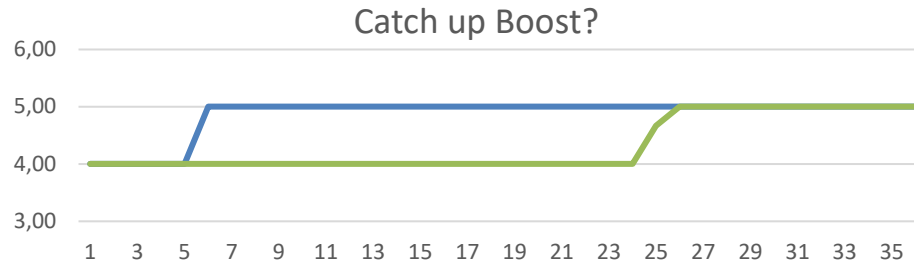
# Travel times in a river system and how they vary



# Travel times example from Tugela



# Travel times example from Tugela







How to operationalise collective management and decision making?

1. Who? Has to and wants to?
2. Organisation and governance structure
3. How will we meet, communicate and learn?



# What more is needed?

- Further capacity, training? When?
- Action?

# Thank you!

# UWASP

uMhlathuze Water Stewardship Partnership



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