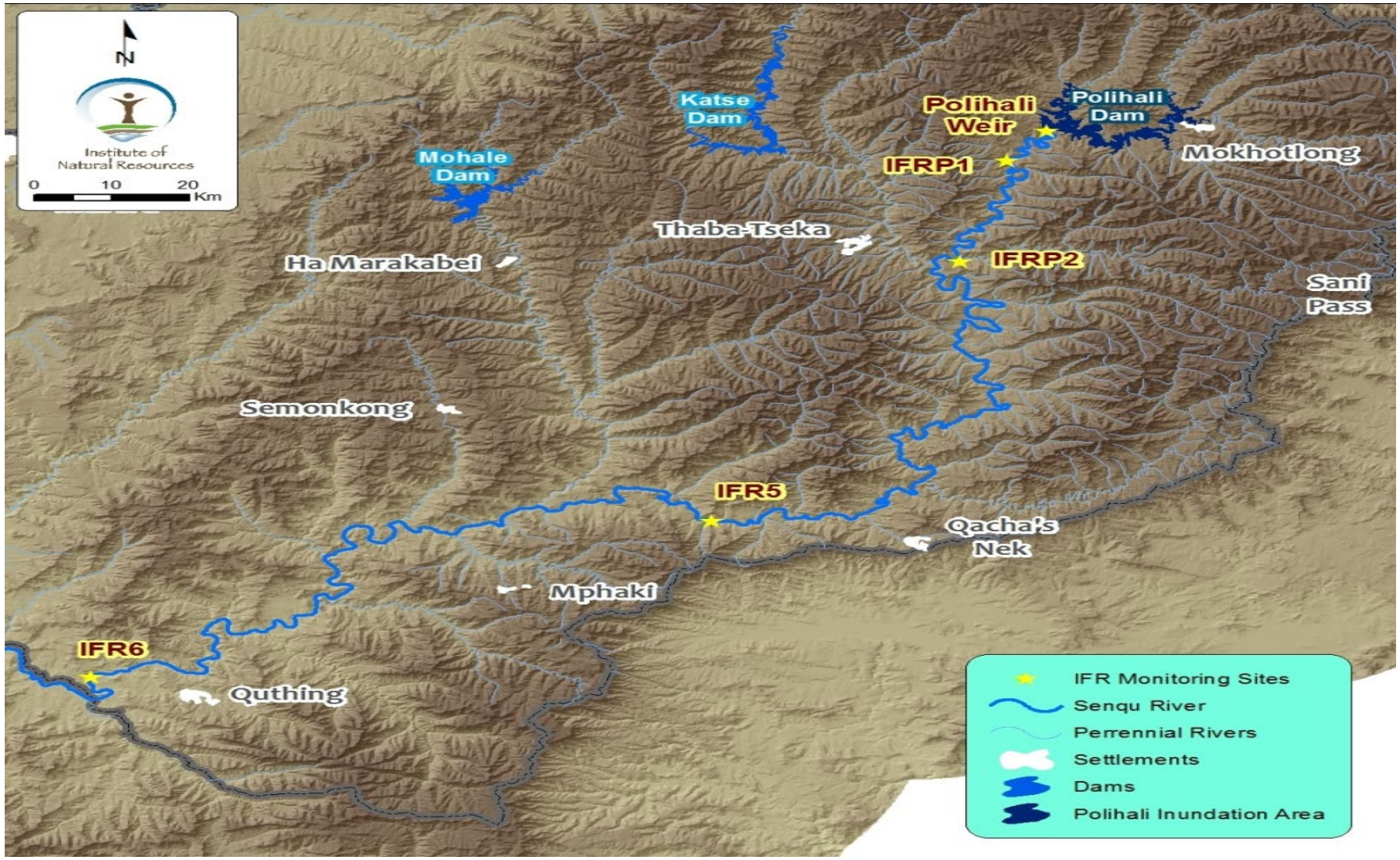
DETERMINATION OF POLIHALI DAM IN-STREAM FLOW REQUIREMENTS

PULE MOKEBE
LHDA
3rd April 2019

BACKGROUND

- Large Dams
- Obligation to keep the impacts to the minimum
- In-Stream Flow Requirement (IFR):
  - Riverine specialists;
  - Available literature & field measurements & observations

STUDY AREA



More than 30 years of successful collaboration

METHODOLOGY

1. Computer Simulation Modelling Approach
   - Did not yield intended results - unrealistic

2. Historical Monitoring Data Approach
   - Based on LHWP I Dams IFR
     - Katse Dam & Mohale Dam (10-12%)
     - Minimum IFR at 12% inflow
     - Regular monitoring of the downstream response
     - Adaptive management
     - Maximum of 18% inflow

IFR IMPACTS OF LHWP I DAM

Malibamats'o River upstream & downstream of Katse Dam

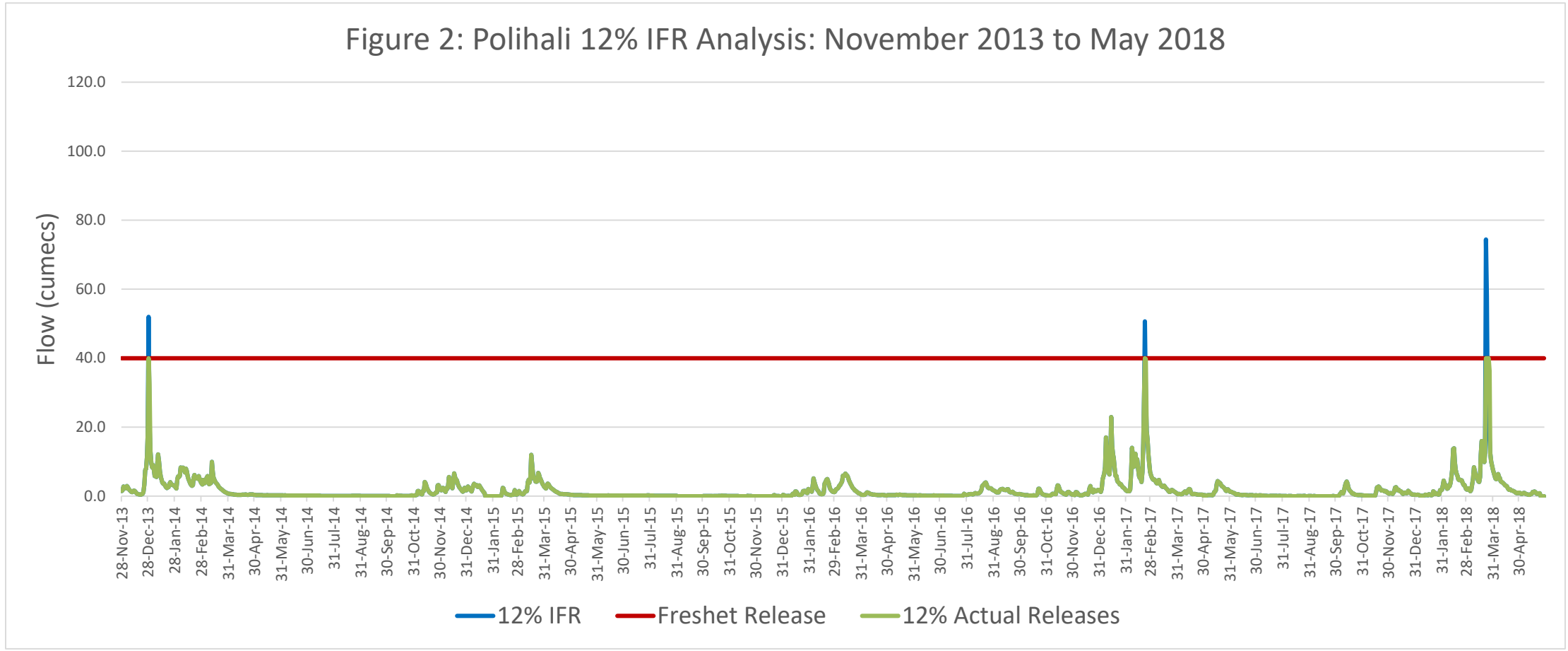
More than 30 years of successful collaboration

METHODOLOGY

Design of Dam Outlet

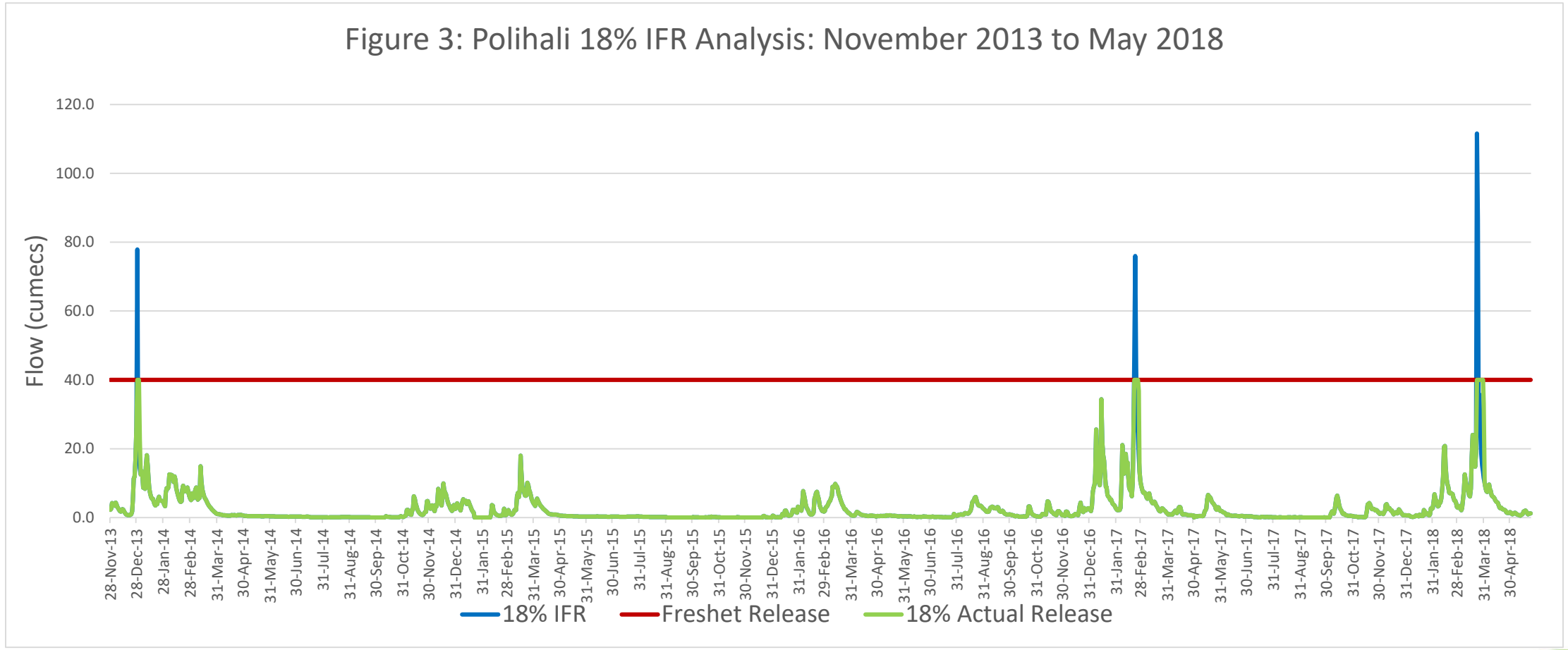
- Limiting outflows to maximum freshet release of 40 m3/s
- Flow hydrographs from Polihali Weir (November 2013 to May 2018).
- Volumetric equivalent of the desired IFR
- Freshet value of 40 cumecs, mostly within hydrograph

POLIHALI 12% IFR



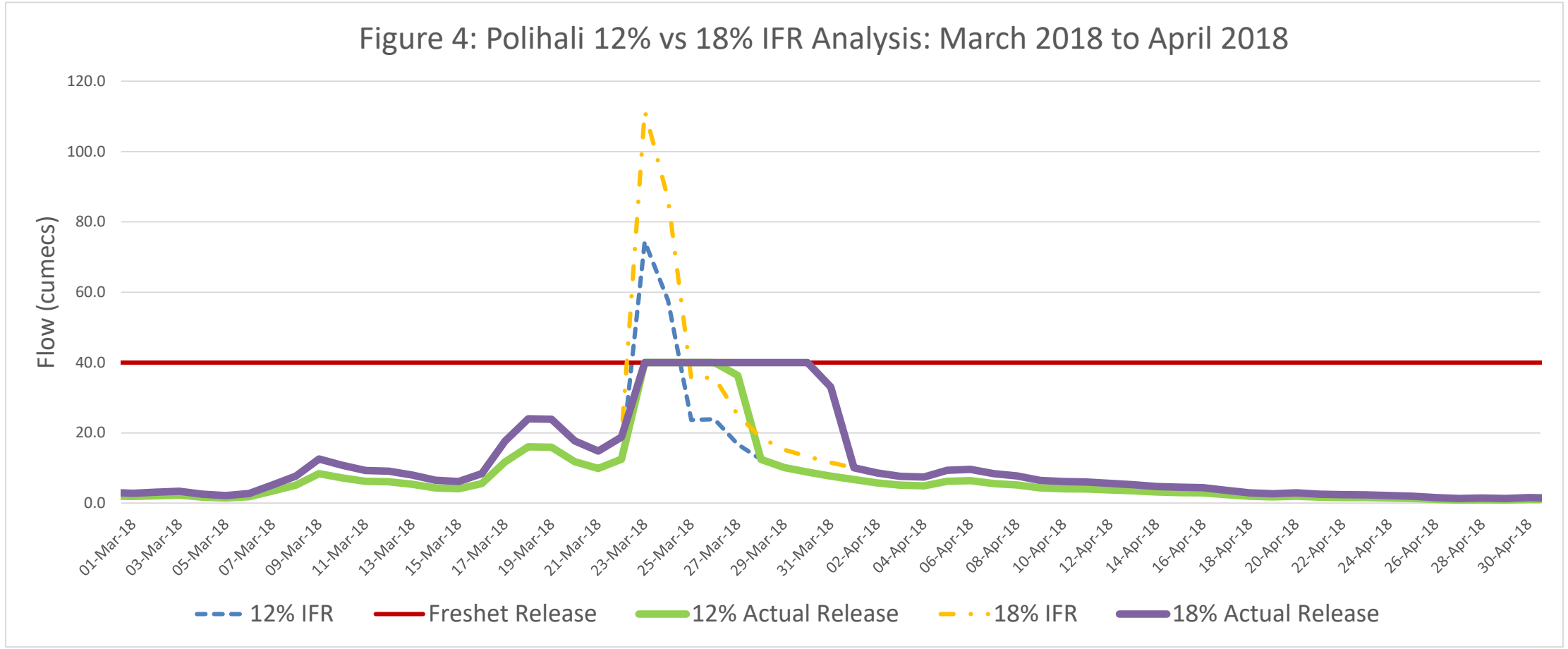
More than 30 years of successful collaboration

POLIHALI 18% IFR



More than 30 years of successful collaboration

COMPARATIVE ANALYSIS



More than 30 years of successful collaboration

CONCLUSIONS

- IFR 12% MAR suitable (using historic information)
- Five upstream gauging stations to determine releases
- IFR system to operate over a full range of flows up to 40m3/s
- Monitor & track the adequacy/impact of flow release
- Polihali Dam outlet system designed for variable flow release


THANK YOU