SWOT water management applications

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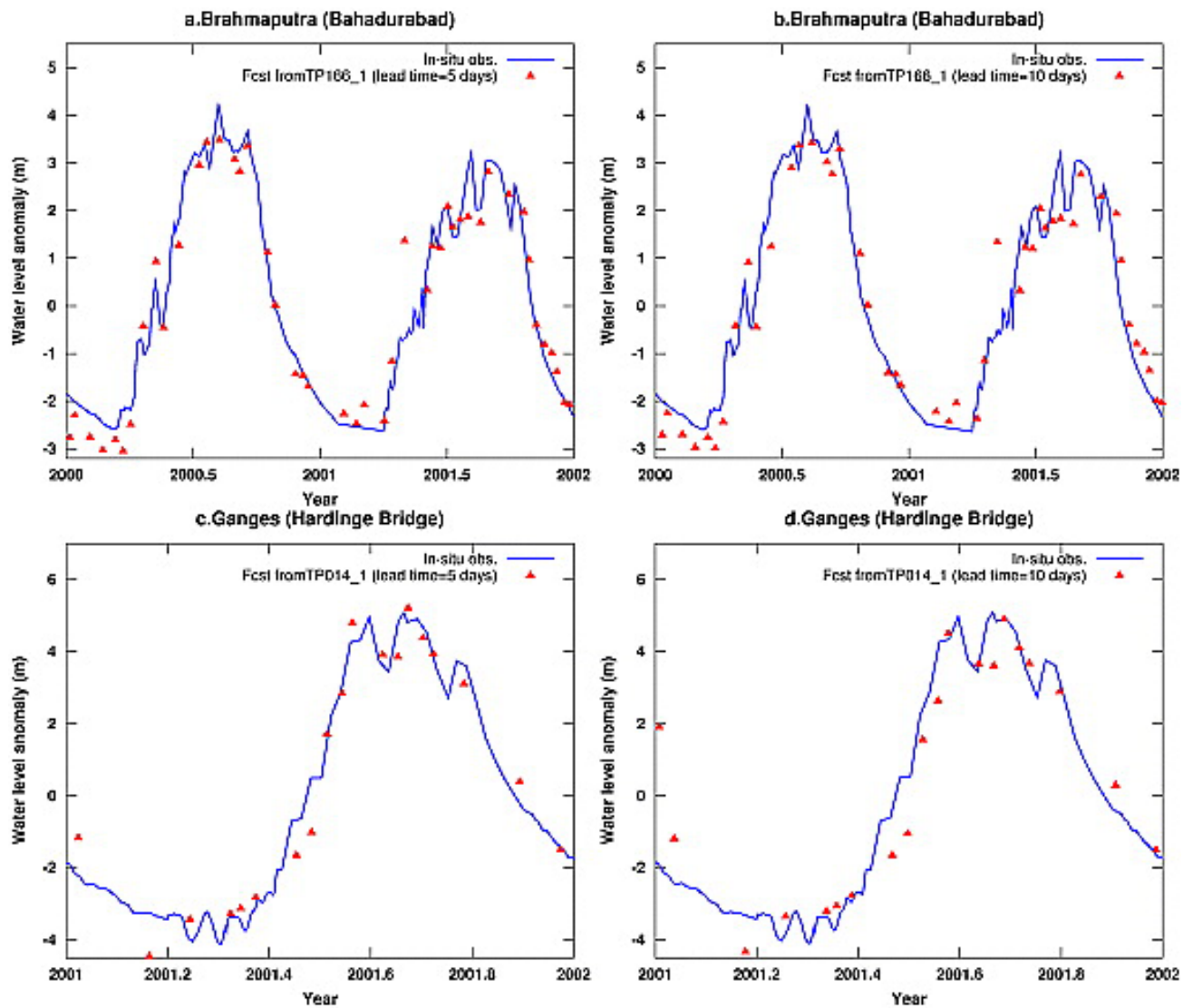
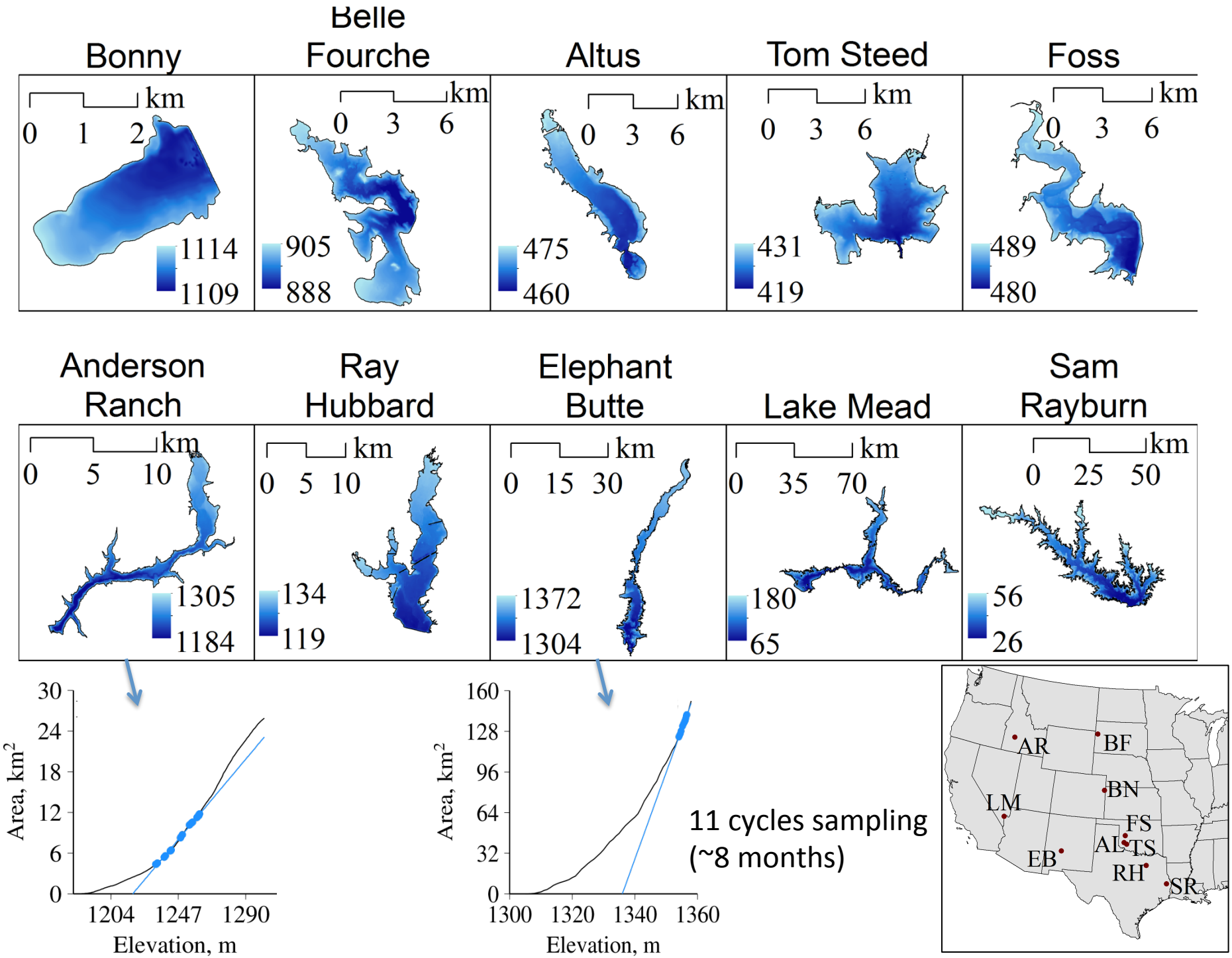
Application question: : ***How can SWOT data best be exploited to provide a more scientific basis for water management, especially in a) transboundary rivers, and b) river basins for which key hydrologic variables are poorly observed by in situ networks?***

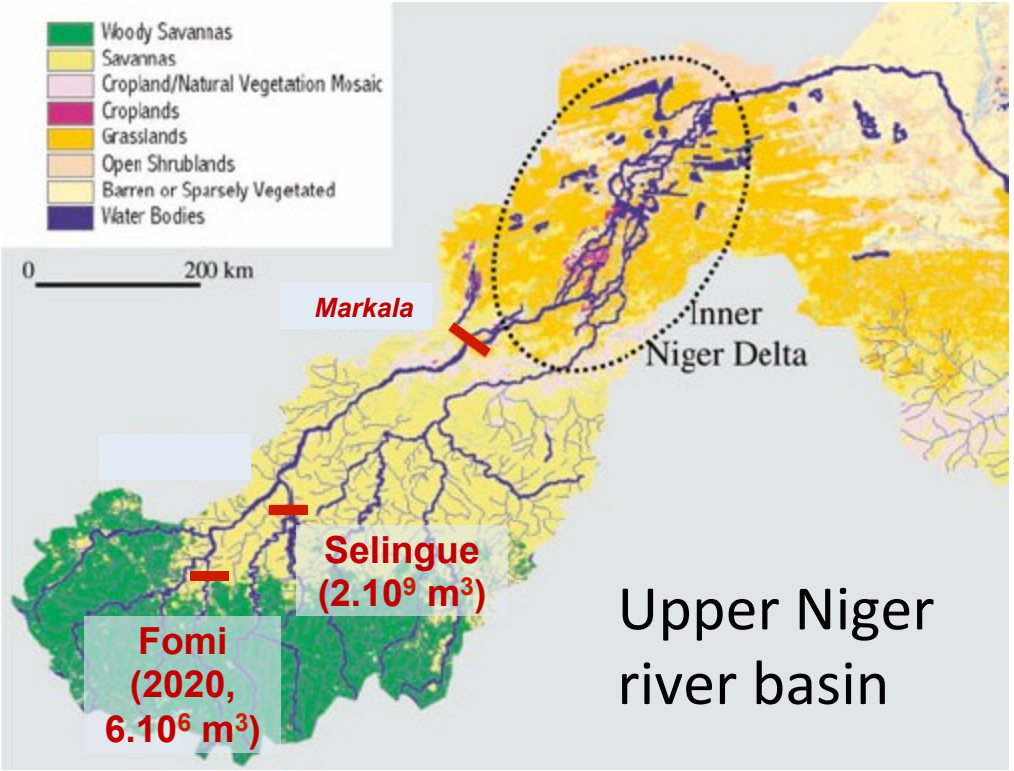
Science question : **What have been the interannual and interseasonal dynamics of water stored in manmade reservoirs globally over the last century, and how can SWOT measurements best be integrated with global modeling strategies to provide better estimates of those quantities in the future?**

Ganges/Brahma-putra transboundary water level prediction using altimetry data

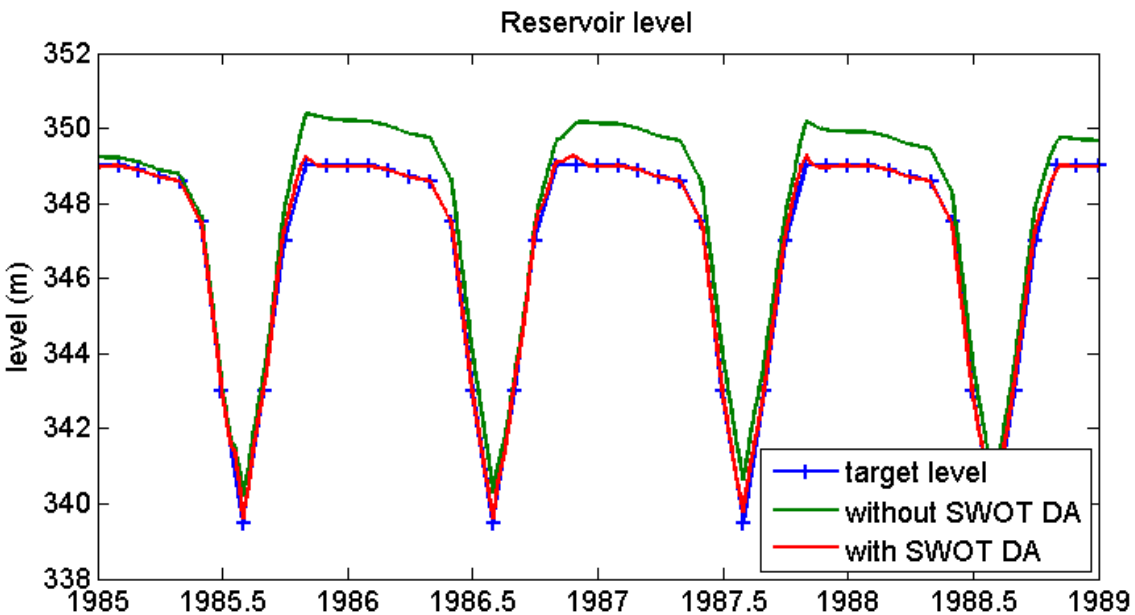


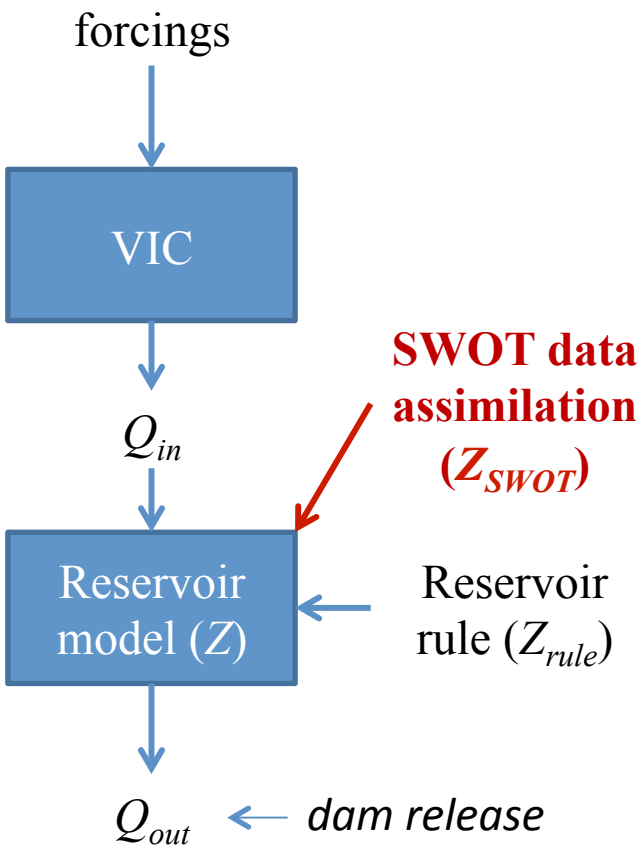
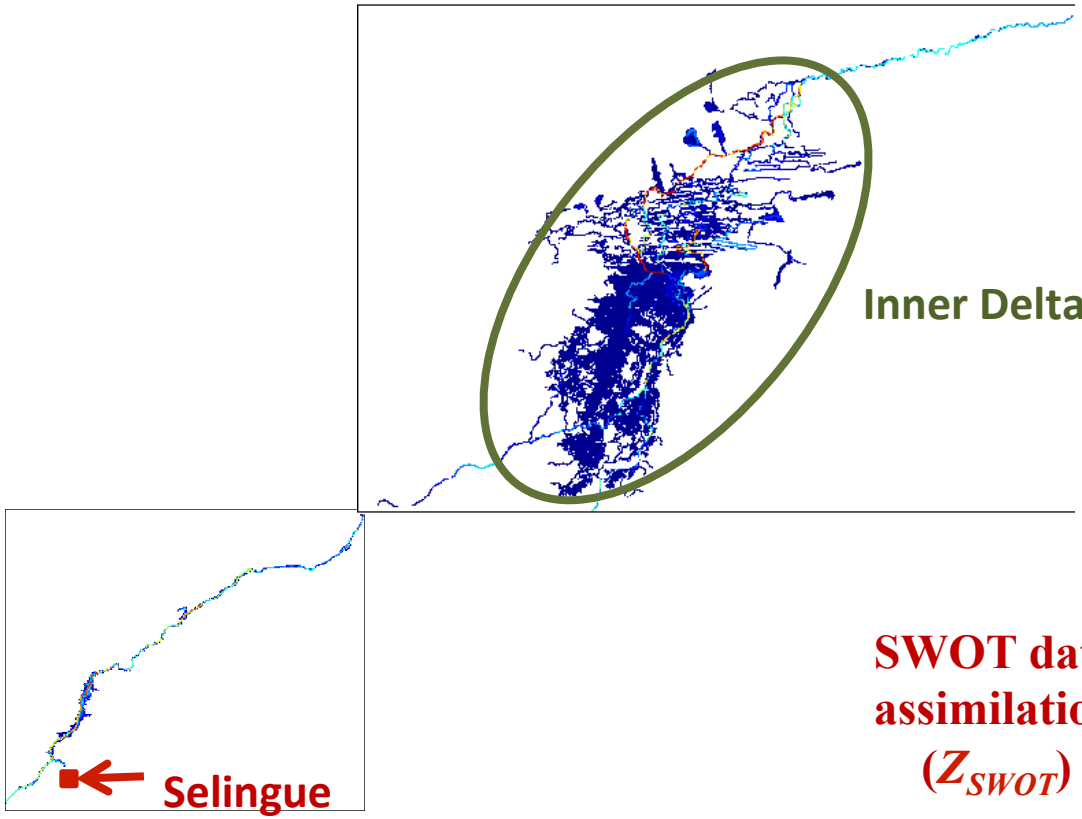
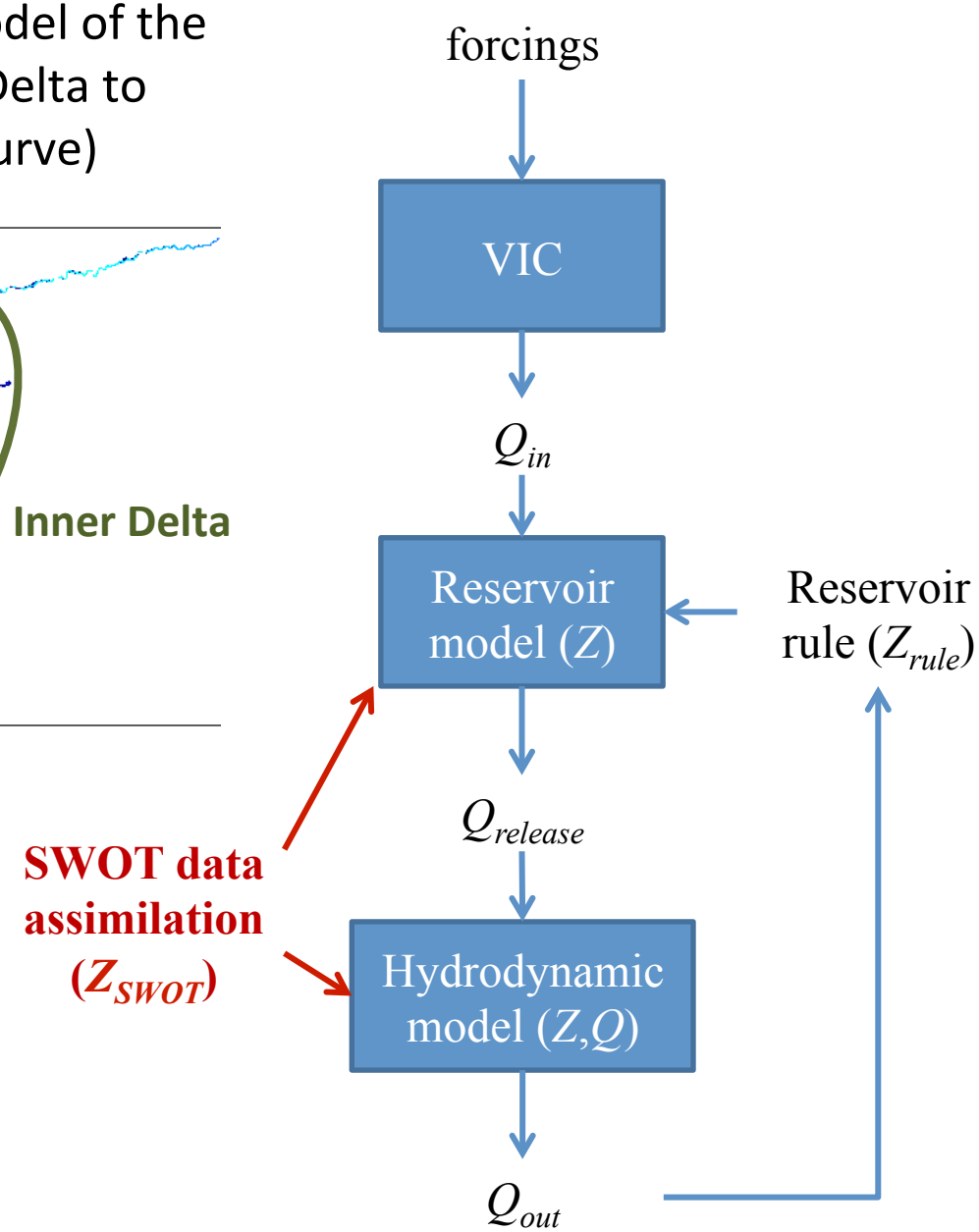
from Biancamaria et al., GRL 2011


Bonny
Belle Fourche
Altus
Tom Steed
Foss
km
0 1 2
1114
1109
0 3 6
905
888
475
460
431
419
489
480
Anderson Ranch
Ray Hubbard
Elephant Butte
Lake Mead
Sam Rayburn
0 5 10
1305
1184
134
119
0 15 30
1372
1304
0 35 70
180
65
0 25 50
56
26
Area, km²
Elevation, m
30
24
18
12
6
0
1204 1247 1290
160
128
96
64
32
0
1300 1320 1340 1360
11 cycles sampling
(~8 months)
AR
BF
BN
LM
FS
AL
TS
EB
RH
SR



SWOT data assimilation (every 12 days) in a reservoir model to improve the representation of reservoir levels and then make more efficient dam releases





SWOT data assimilation (water level and surface extent) in a hydrodynamic model of the upper Niger river including the Inner Delta to improve reservoir rule (dam release curve)