



Hydroclimate Project for Lake Victoria Basin (HYVIC)

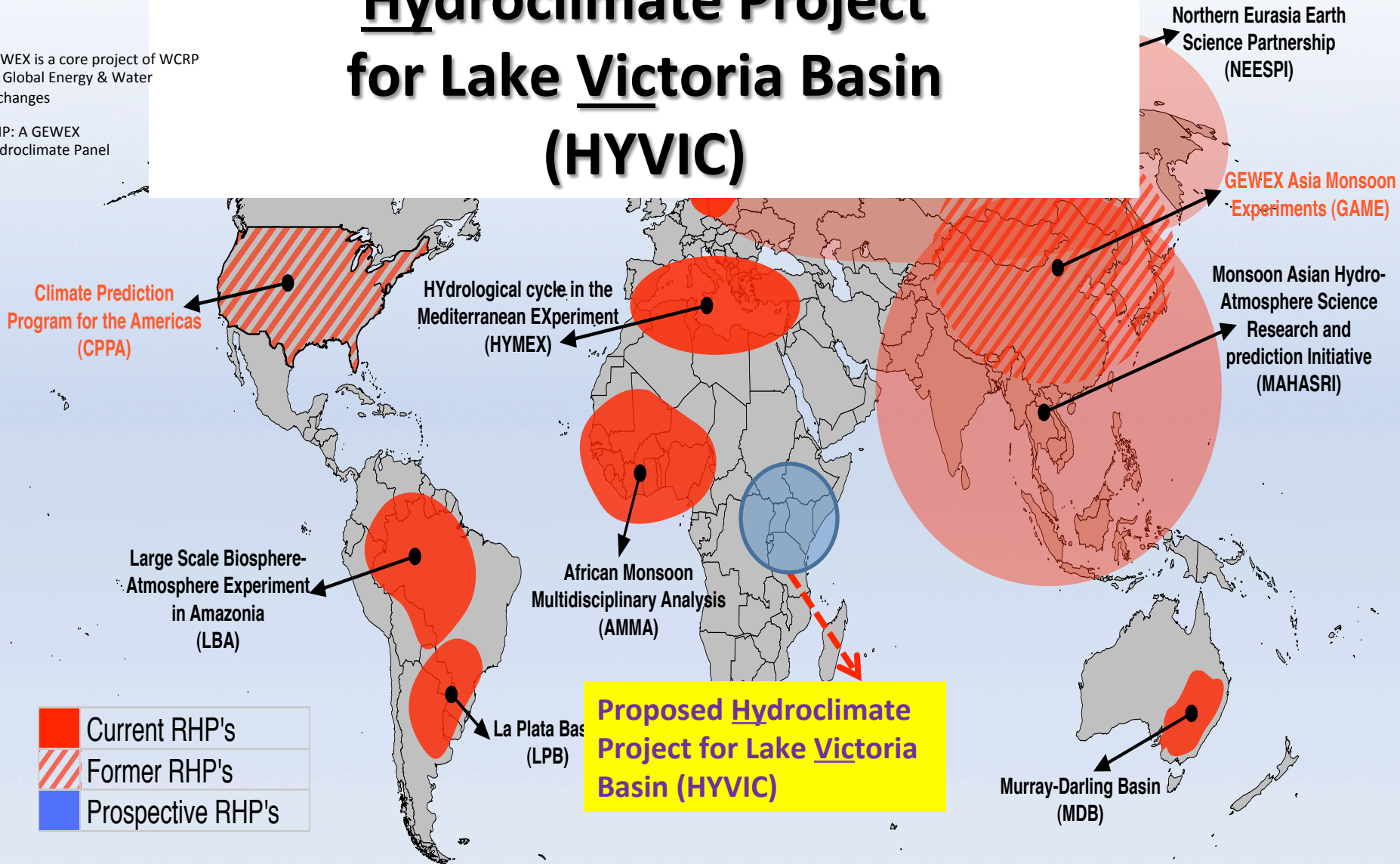
Meeting of the WCRP GEWEX Project
GHP, 10-17 July 2014.



Proposed GEWEX RHP Hydroclimate Project for Lake Victoria Basin (HYVIC)

GEWEX is a core project of WCRP
on Global Energy & Water
Exchanges

GHP: A GEWEX
Hydroclimate Panel



HYVIC International Steering Committee (IPC)

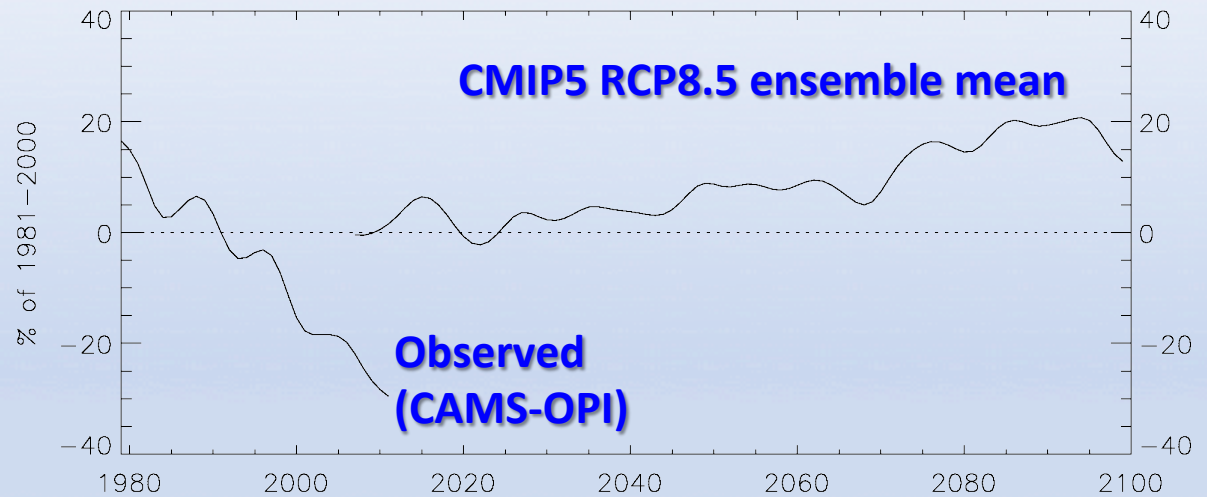
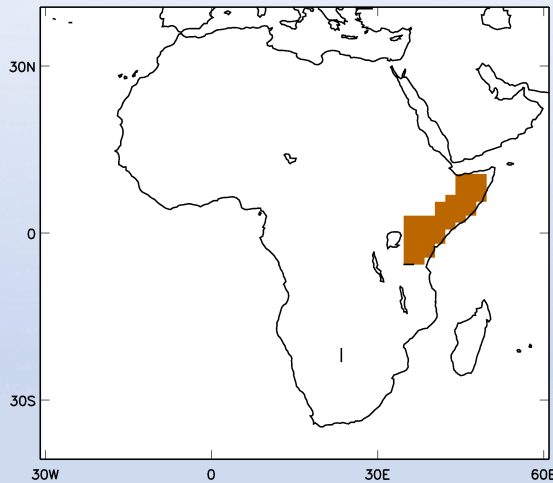
1. Fredrick Semazzi (Chair), North Carolina State University, USA; **IPC Chair & Lead HyVic US**
2. Richard Anyah, U. of Connecticut
3. Rita Roberts, NCAR/UCAR
4. Lian Xie, North Carolina State University
5. Kamazima Lwiza (Stony Brook University, NY, USA) - **(REQUEST GHP TO BE ADDED TO IPC)**
6. Steven Goodman (GSFC/NOAA) - **(REQUEST GHP TO BE ADDED TO IPC)**
7. Richard Ogutu (NAFRRI, Uganda); **Lead HyVic-EA (REQUEST GHP TO BE ADDED TO IPC)**
8. Laban Ogallo, Climate Prediction and Applications Centre (ICPAC), EA
9. Pascal Waniha, Tanzania Meteorology Agency (TMA), Tanzania
10. Andrew Githeko, Kenya Medical Research Institute, Kenya
11. Felix Mutua (Jomo Kenyatta University of Agriculture and Technology), Kenya
12. Rosalind Cornforth, University of Reading, **UK; Lead UK**
13. Helen Houghton-Carr, CEH/NERC
14. Caroline Bain, UKMO

HYVIC IPC Terms of Reference

- Update and finalize the science plan
- Set the overarching science questions to guide the project
- Prepare communication material for HyVIC
- Coordinate partnerships with funding agencies
- Coordinate proposal submissions to agencies

Past & Projected Climate (Rainfall)

Low-pass filtered rainfall (>10yr), MAM average over Greater Horn of Africa



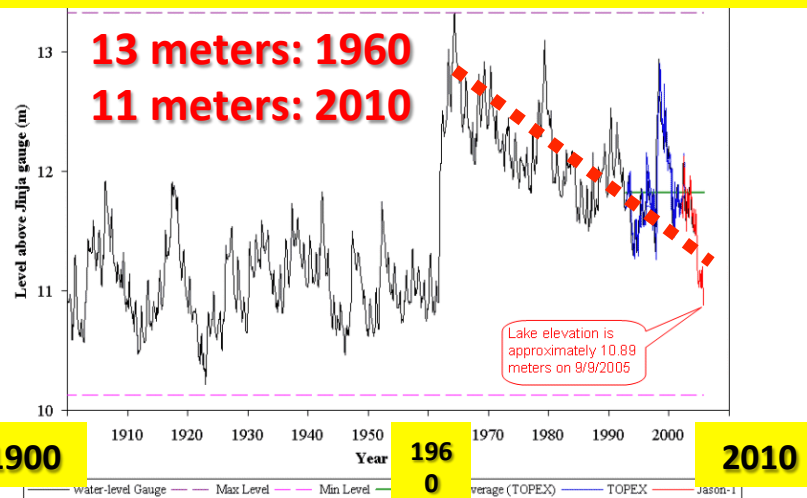
*(David Rowell,
UKMO, 2013)*

- **Persistent past decline & projected reversal and increase**
- **Phenomenon known as the Eastern-Central African climate change paradox**
- **Could have profound implications on LVB sustainable development for more than 35 - 40 million people**

Past & Projected Climate (lake levels)

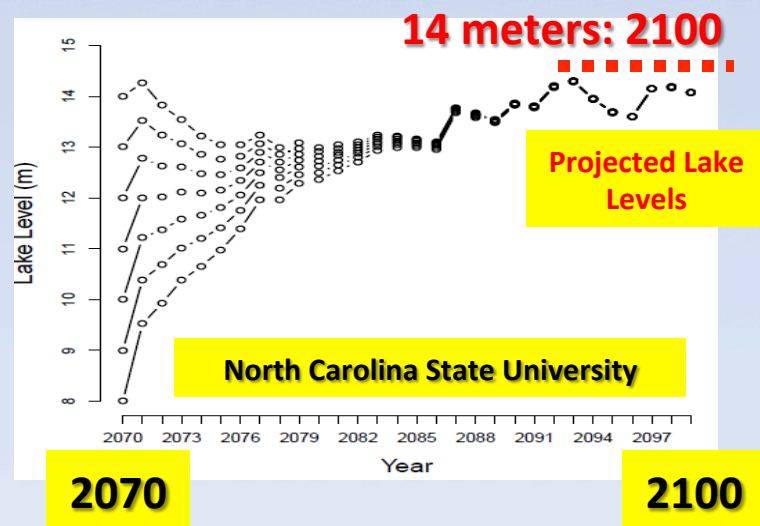
- Persistent past decline & projected reversal and increase
- This phenomenon is the Eastern-Central African climate change paradox – 'Lake Victoria Basin Climate Change Paradox'
- Likely to have profound implications on LVB sustainable development for more than 35 - 40 million people

Past & Projected Lake Victoria Levels



Data Source:
 Historical water level gauge data from Jinja, Uganda (near Lake Victoria's outlet)
 Satellite radar altimeter data from USDS/NASA/UMD at:
http://www.pecad.fas.usda.gov/cropeplorer/global_reservoir/

U.S. Department of Agricultural (USDA)
 Foreign Agricultural Service (FAS)
 Production Estimates & Crop
 Assessment Division (PECAD)



RegCM downscaled rainfall for **2071-2100** used as input for the Tate et al (2004) WBM to compute the LL. (Smith, 2011); **evaporation is 13.5% above present level based on A2 scenario. Thus projection is 2 meters above present lake levels. (Kara et al, 2013)**

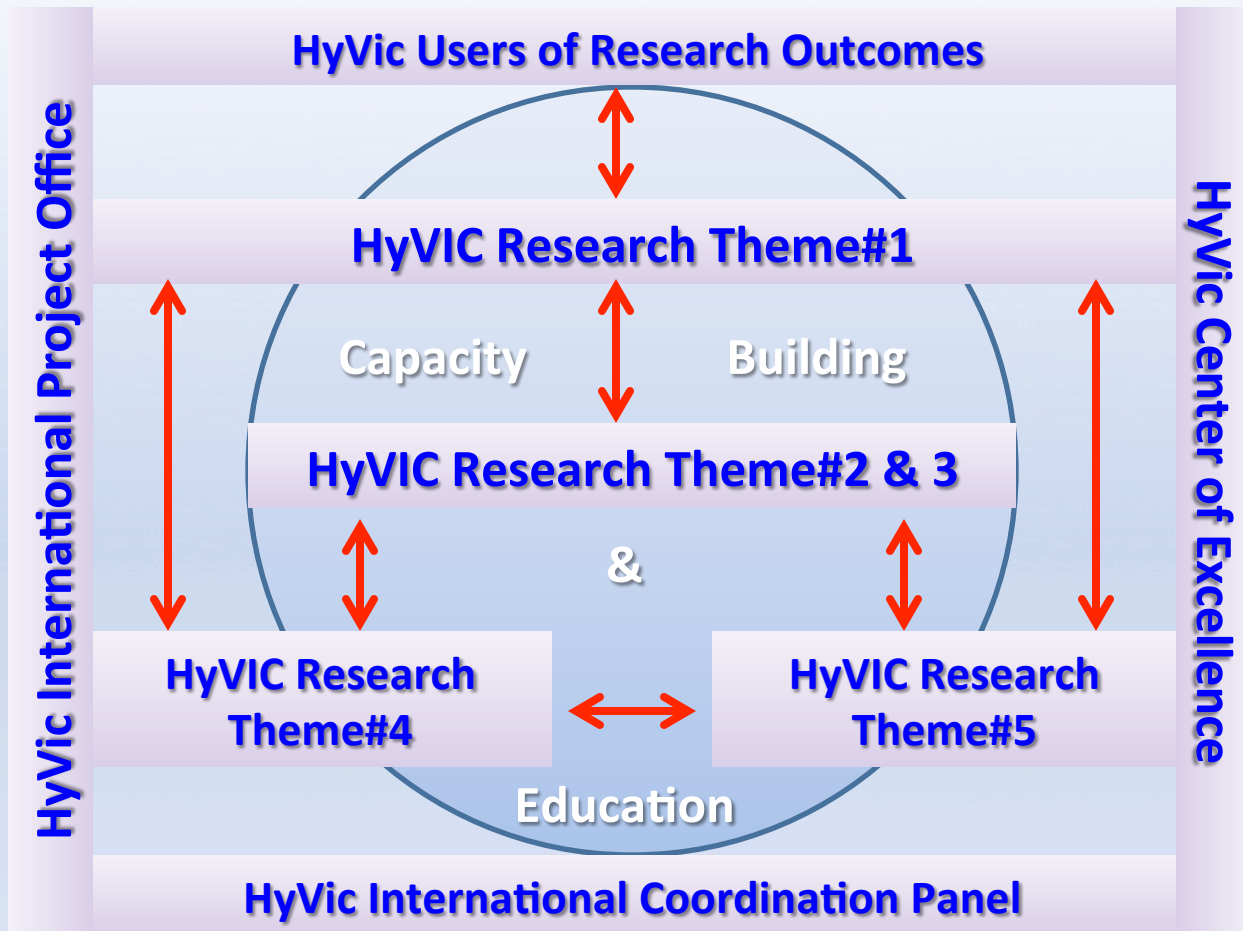
HyVic High Level Science Questions

The primary scientific challenge therefore is to reduce the present high levels of uncertainty associated with the paradox problem by ascertaining,

- (i) whether indeed the reversal will occur,
- (ii) the timing of when it will materialize and
- (iii) whether these two factors will be determinable at acceptable levels of confidence to inform the management of the leading regional climate sectors.

HyVic models will take into account the critical factors including the record projected Urbanization of the LVB and comprehensive modeling of the role of Lake Victoria water circulation and temperature on the basin's climate.

HyVIC Science Plan Components



HyVIC Research Theme-1: Translational Research Interface with Applications

HyVIC Research Theme-2: Severe Weather and Water Currents (collaboration with WWRP-LVP)

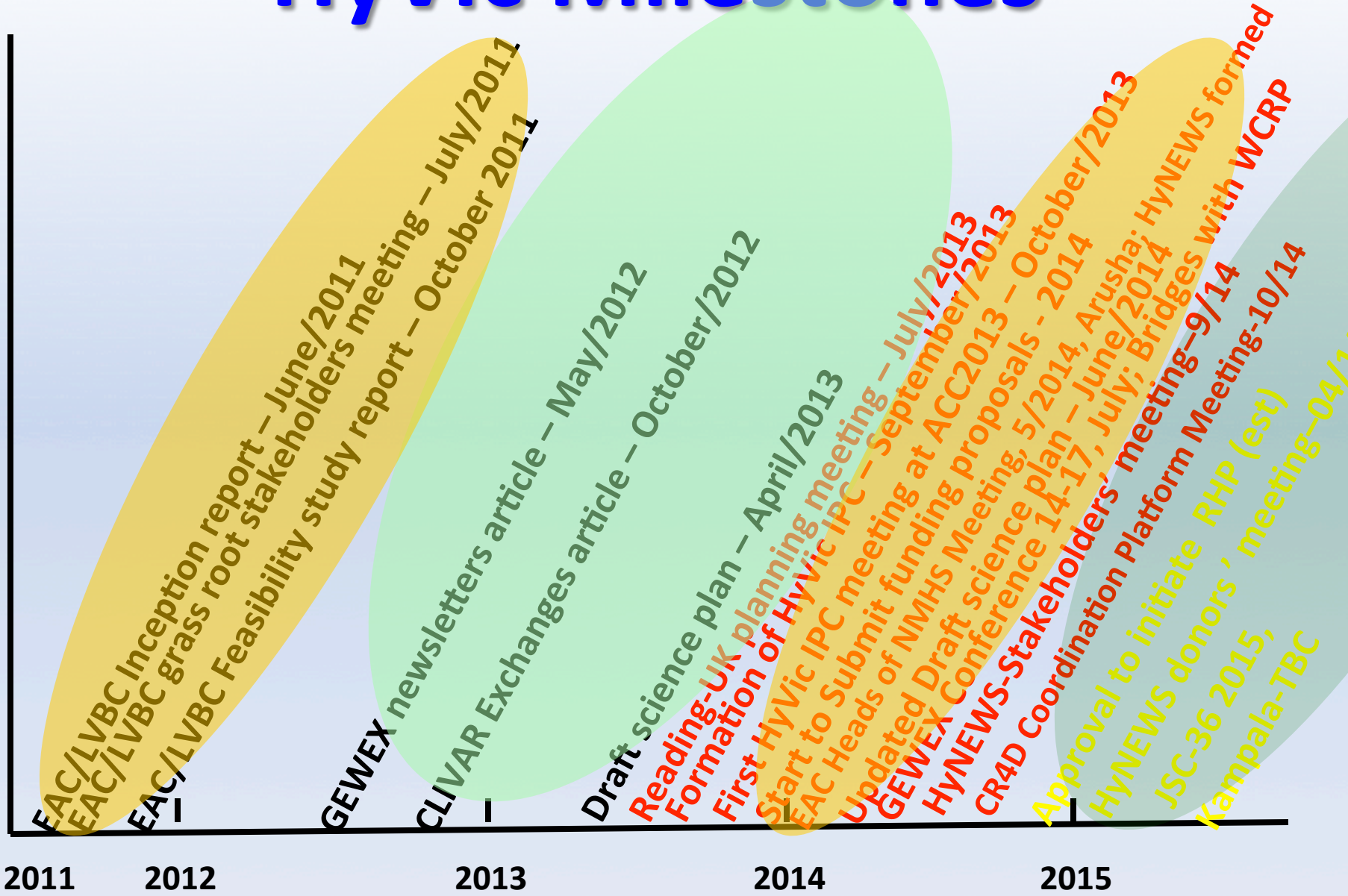
HyVIC Research Theme-3: Lake Victoria Basin Water Budget

HyVIC Research Theme-4: Climate variability and model development

HyVIC Research Theme-5: Observation of the Hydroclimatological System

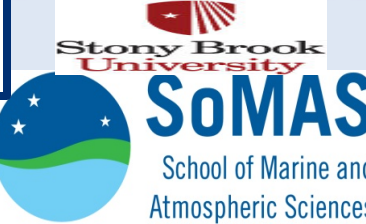
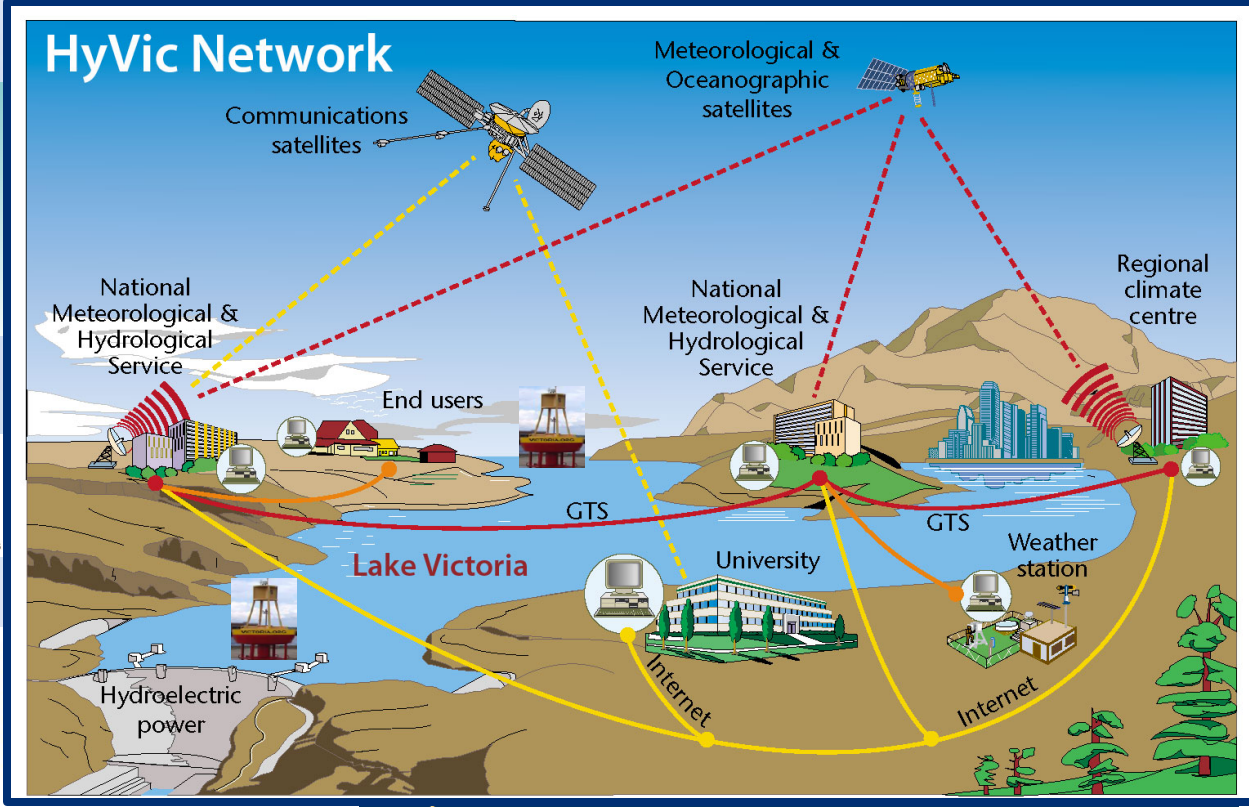
(Customized from GFCS)

HyVic Milestones





HyVic Network





HyCRISTAL PROJECT-BP 4 Million

Integrating Hydro-Climate Science into Policy Decisions for Climate Resilient Infrastructure and Livelihoods in East Africa





Thank You