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# BioRA DSS Workshop

## Process for populating response curves



BioRA DSS Technical Workshop  
Phnom Penh, Cambodia  
15-19 February 2016

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- Background
- Process for constructing response curves





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# BACKGROUND

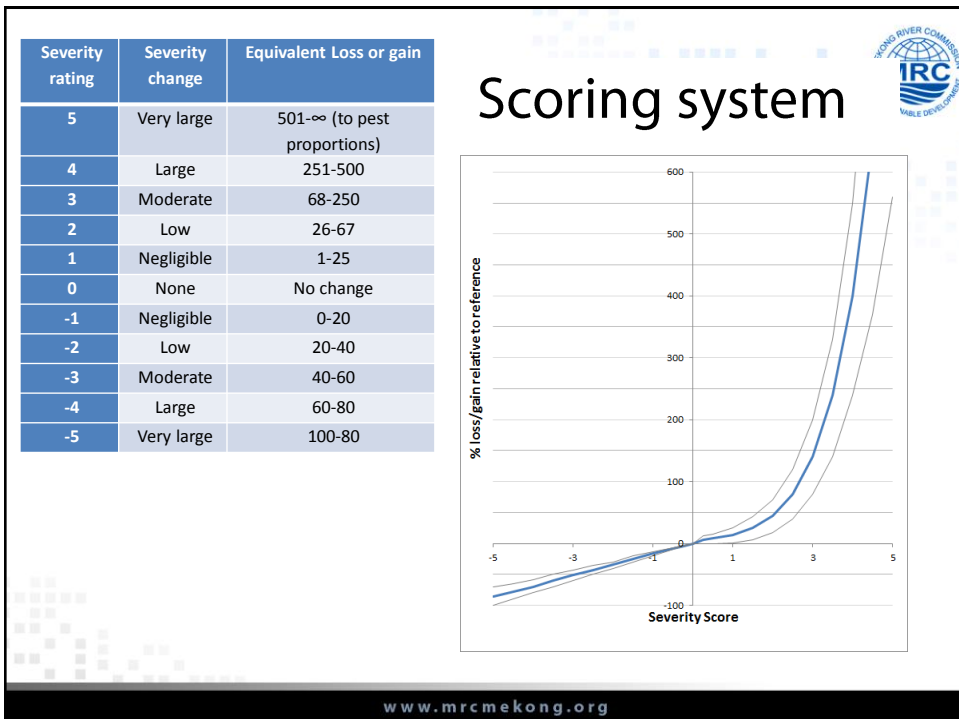
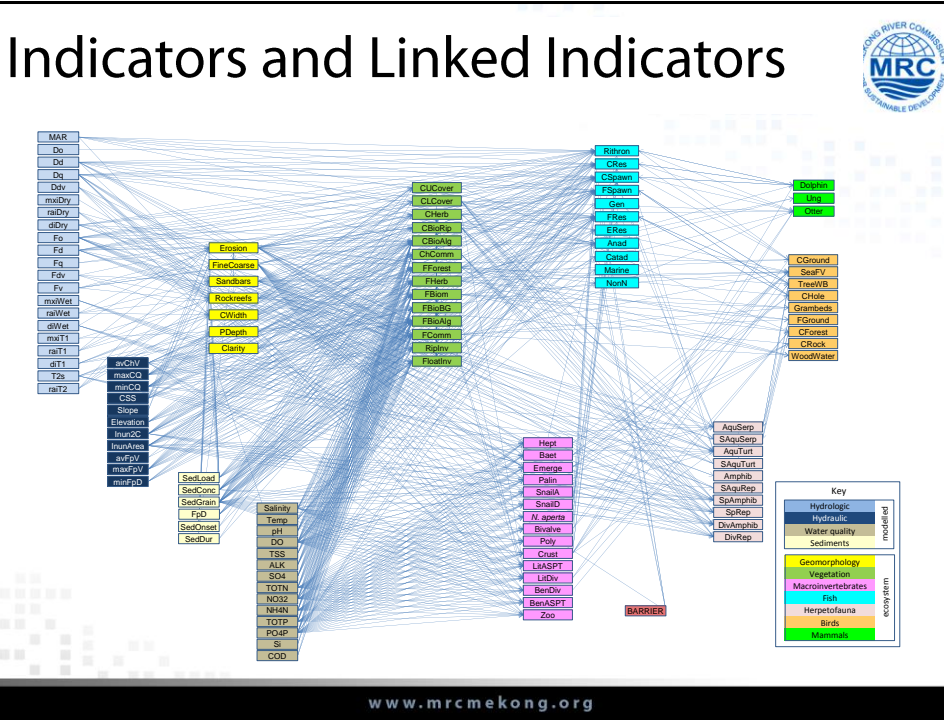
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## Response Curves

- Response curves are the 'brains' of the DSS
- They are constructed by specialists
- They are created for each link
- A scoring system is used to capture the direction and magnitude of each response
- Some response curves address connectivity and/or non-WR 'exogenous' pressures
- 200-400 response curves per FA

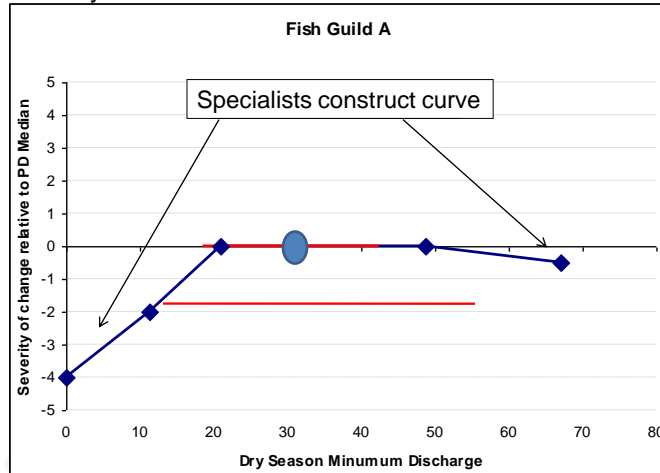
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# Example: Response Curve

Response of one ecosystem indicator (Fish Guild A) to minimum dry-season flows in a year



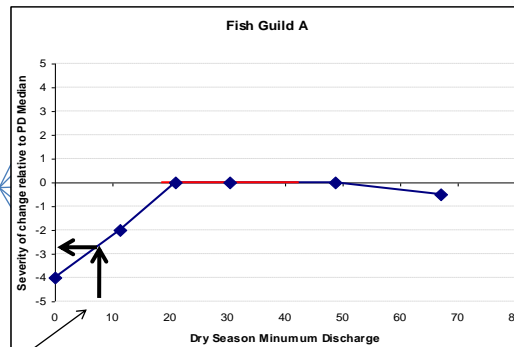
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# DSS operation



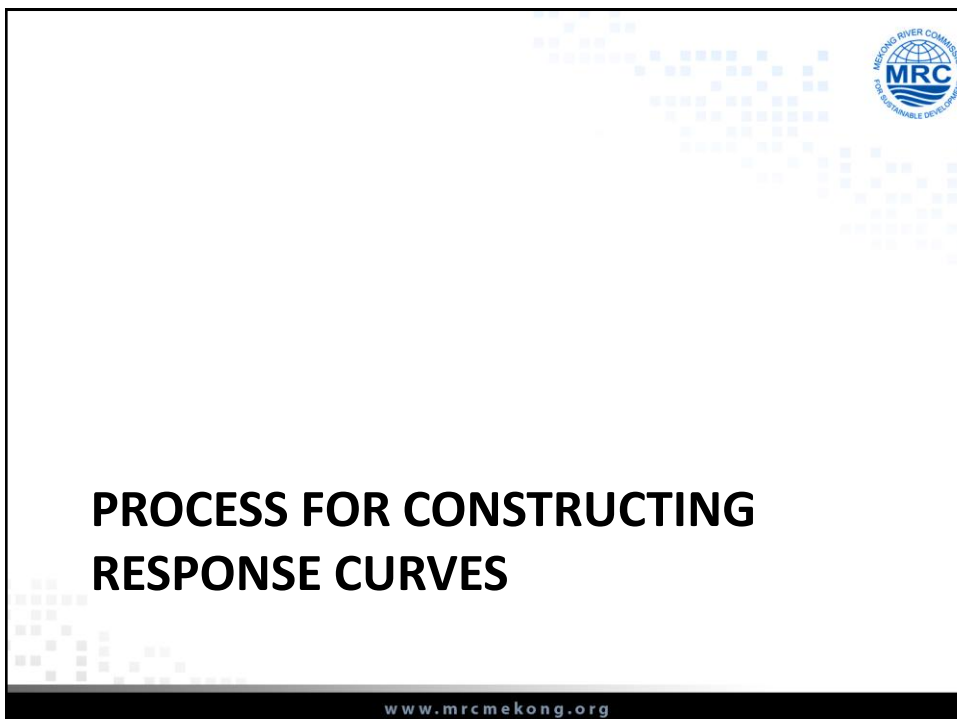
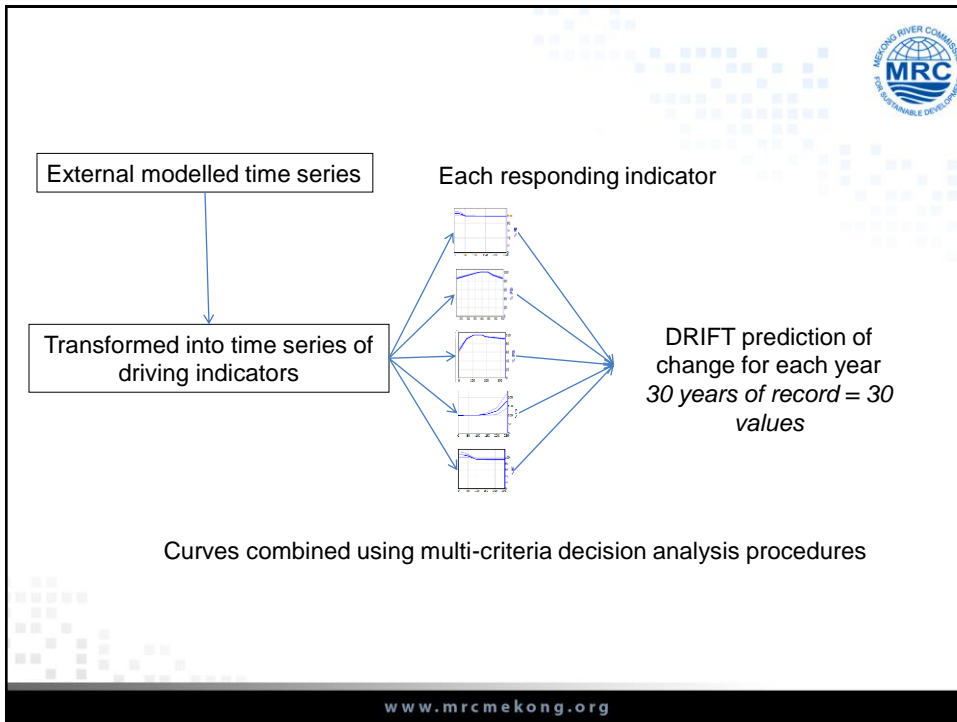
Modelled time series

Transformed into time series of driving indicators



Scenario: Dry season minimum discharge for each year

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# BioRA: Constructing curves

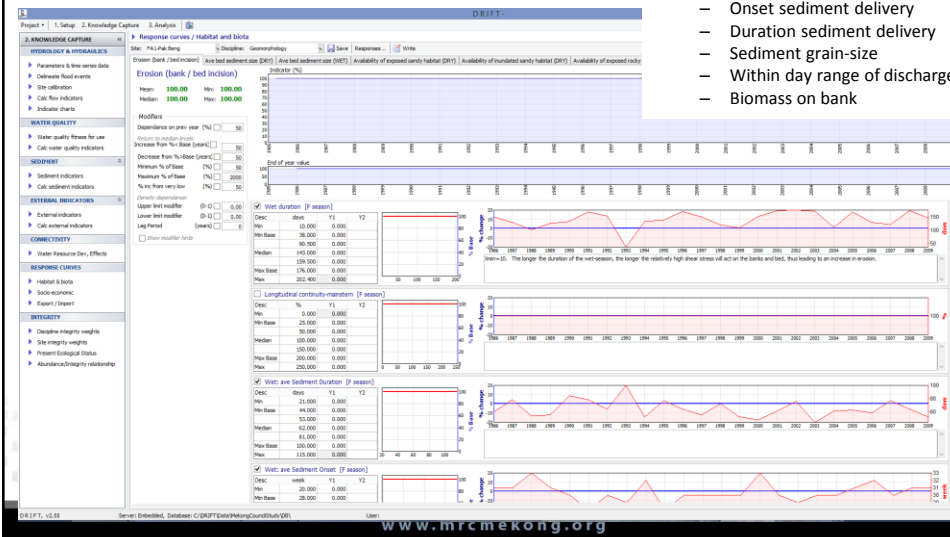


- March 2015: Introduction to DSS  
Field visit to the Delta and Tonle Sap
- April 2015: Literature search  
Status and trends assessment
- June/July 2015: DSS Set-up Workgroup Meetings (initial RCs)
- September 2015: Knowledge Capture Workshop (RCs)
- October 2015: Individual liaison and refinement
- February 2016: This workshop**
- June 2016: Calibration Workshop
- July-October 2016: Individual liaison and refinement

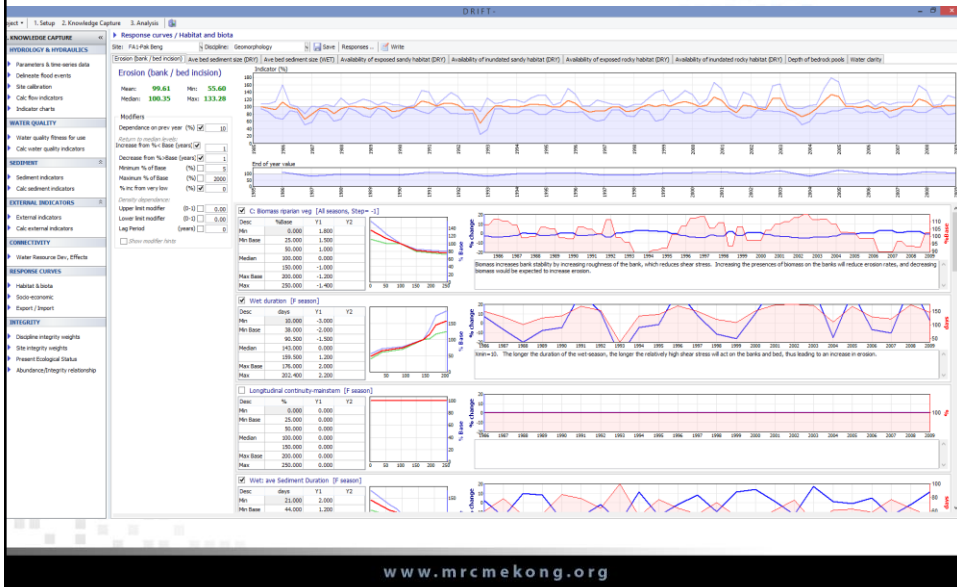
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## DSS before specialist input

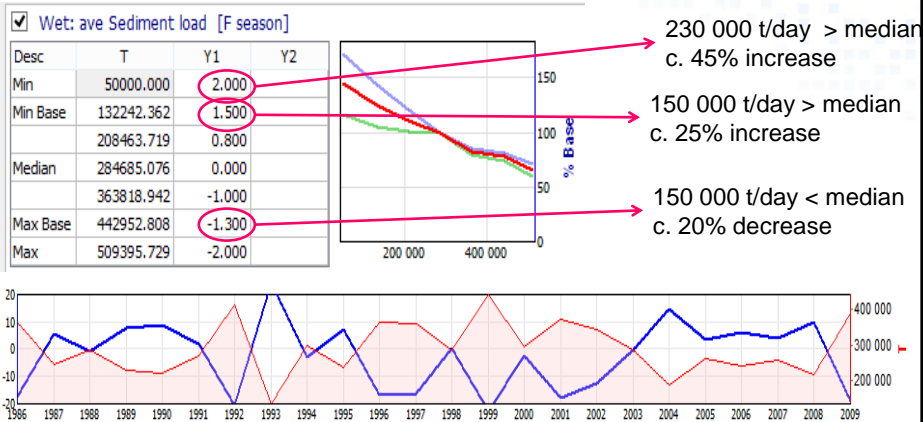
- Erosion
- Linked to:
  - Shear stress
  - Duration of wet
  - Sediment load
  - Sediment concentration
  - Onset sediment delivery
  - Duration sediment delivery
  - Sediment grain-size
  - Within day range of discharge
  - Biomass on bank



# Develop response curves (FA1)

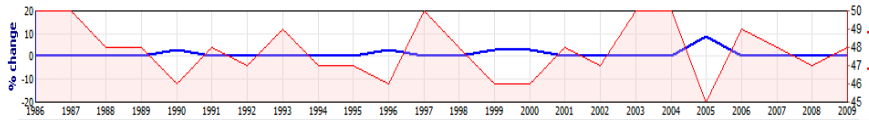
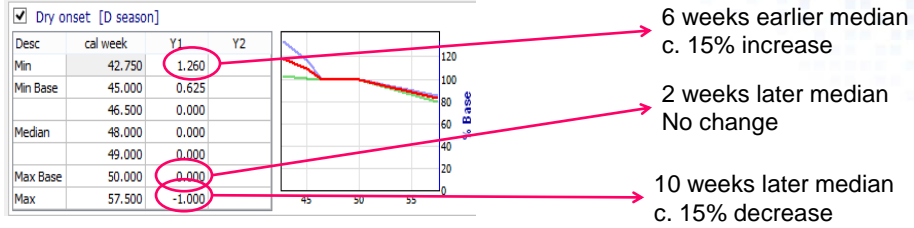


# Erosion vs Sediment load (wet)



The higher the wet season average sediment load, the more river energy that is expended carrying sediment, and the lower likelihood of erosion.

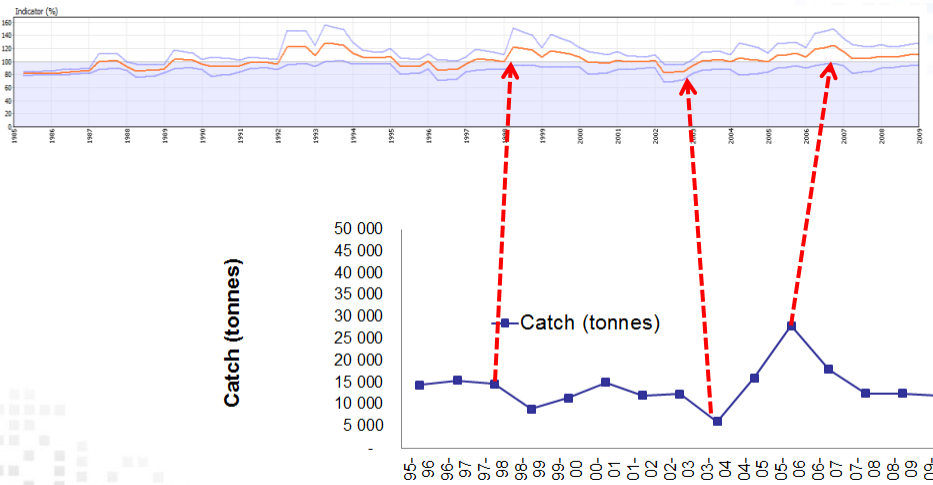
# Rhithron fish vs onset of dry season



The onset of the dry season represents a time rhithron species are able to migrate to shallower areas with suitable substrate for spawning, earlier onset allows the fish greater time to migrate but late onset can disrupt spawning migration and maturation. Also if dry season starts earlier, it beneficial as fish can mature in less stressful conditions prior to spawning.

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# Compare with monitoring data



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## Teams responsible for curves



Discipline	Lead	National
Geomorphology	Lois Koehnken	Bounheng Soutichak Idsariya Wudtisin Toch Sophon
Vegetation	Andrew McDonald Nguyen Thi Ngoc Anh/ Duong Thi Hoang Oanh	Luu Hong Truong Thananh Khotpathoom
Macroinvertebrates	Ian Campbell	-
Fish	Ian Cowx	Chaiwut Grudpun Chavalit Vidthayanon Chea Tharith Kaviphone Phouthavong Kenzo Utsugi Vu Vi An
Herpetofauna	Hoang Minh Duc	Pich Sereywath
Birds and mammals	Anthony Stones	Phaivanh Phiapalath

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Thank You



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