The Effect of Operation of Mosul Dam on Sediment Transport in its Reservoir

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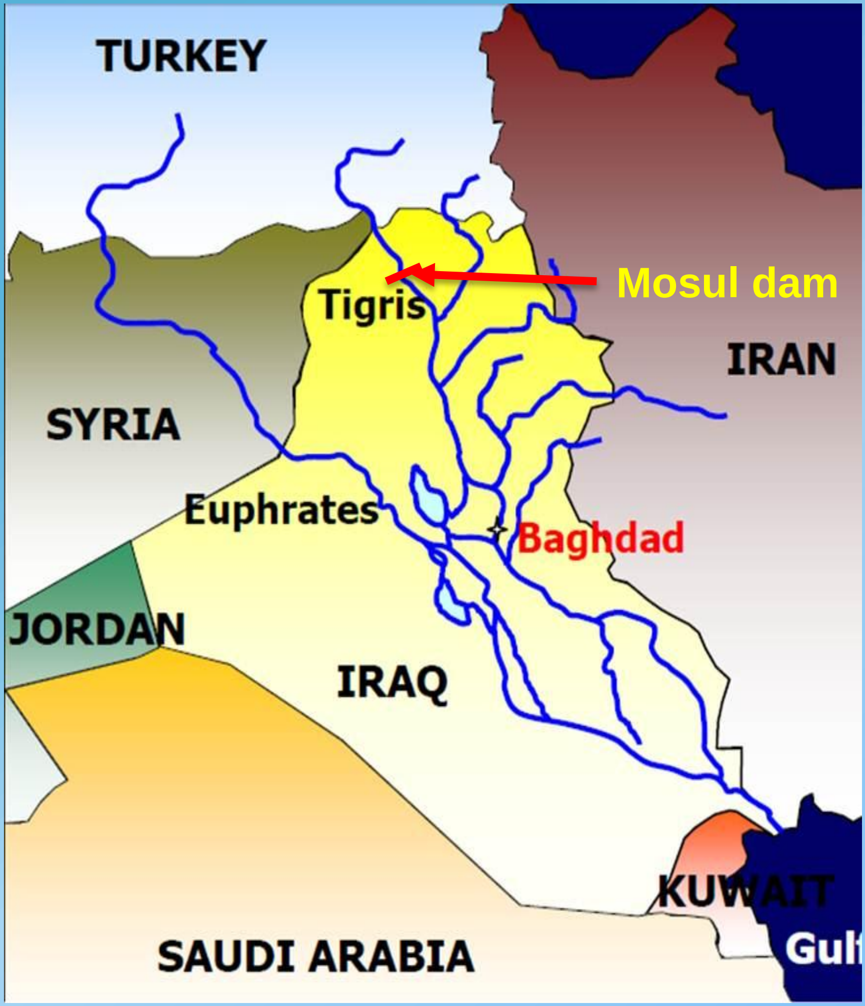
I. INTRODUCTION



II. THE STUDY AREA

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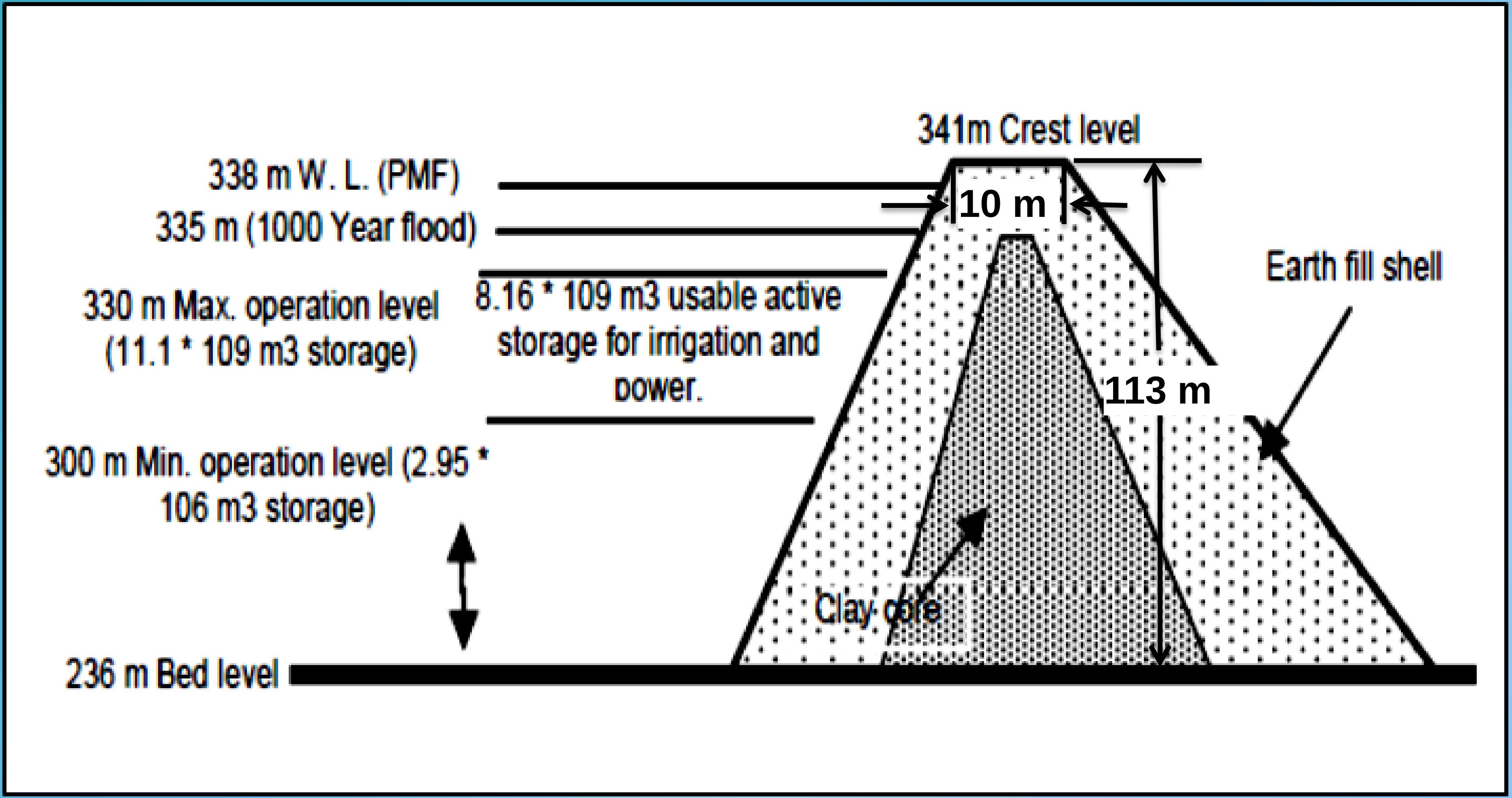

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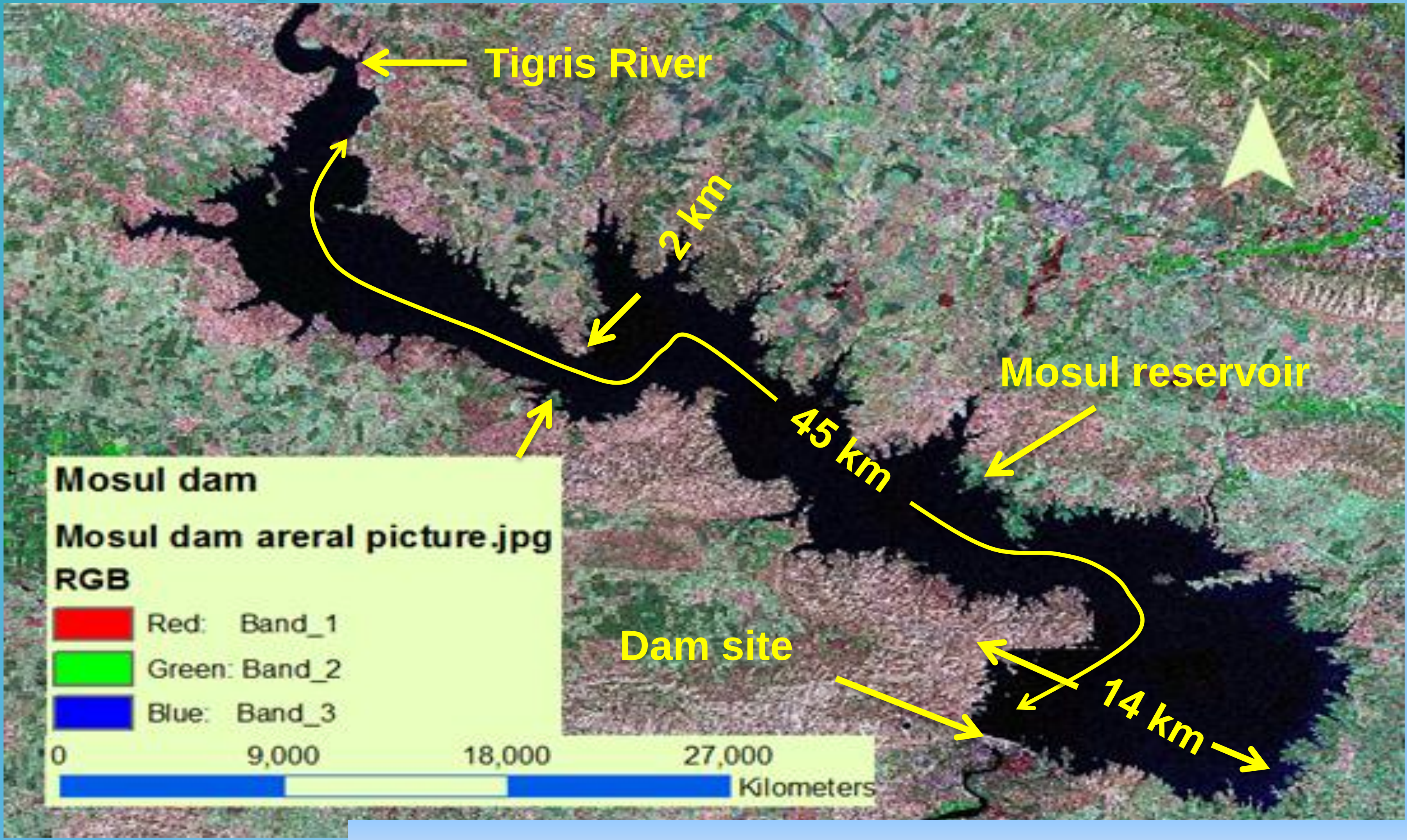
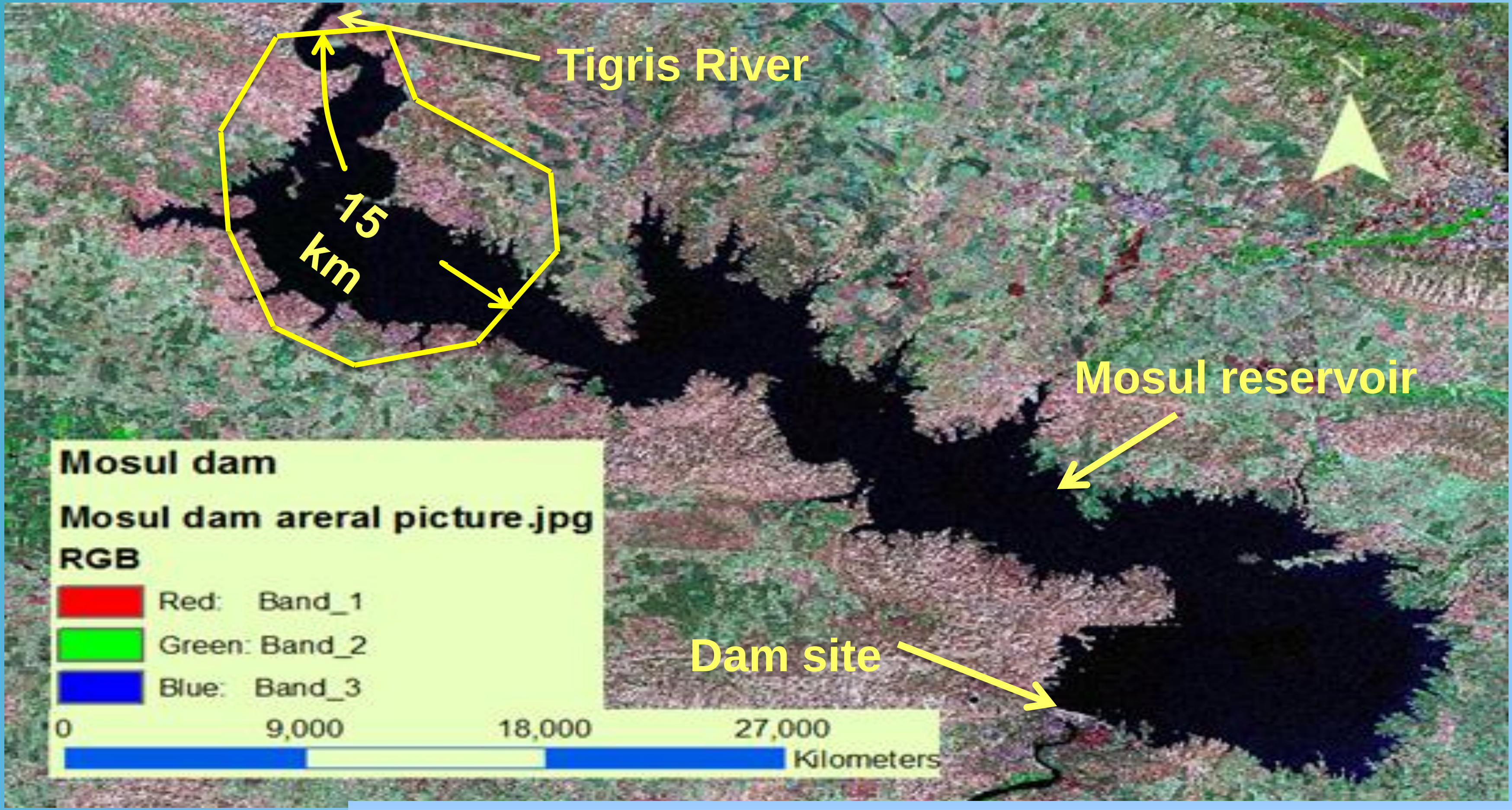


III. EXPERIMENTAL INVESTIGATION

1. The physical hydraulic model



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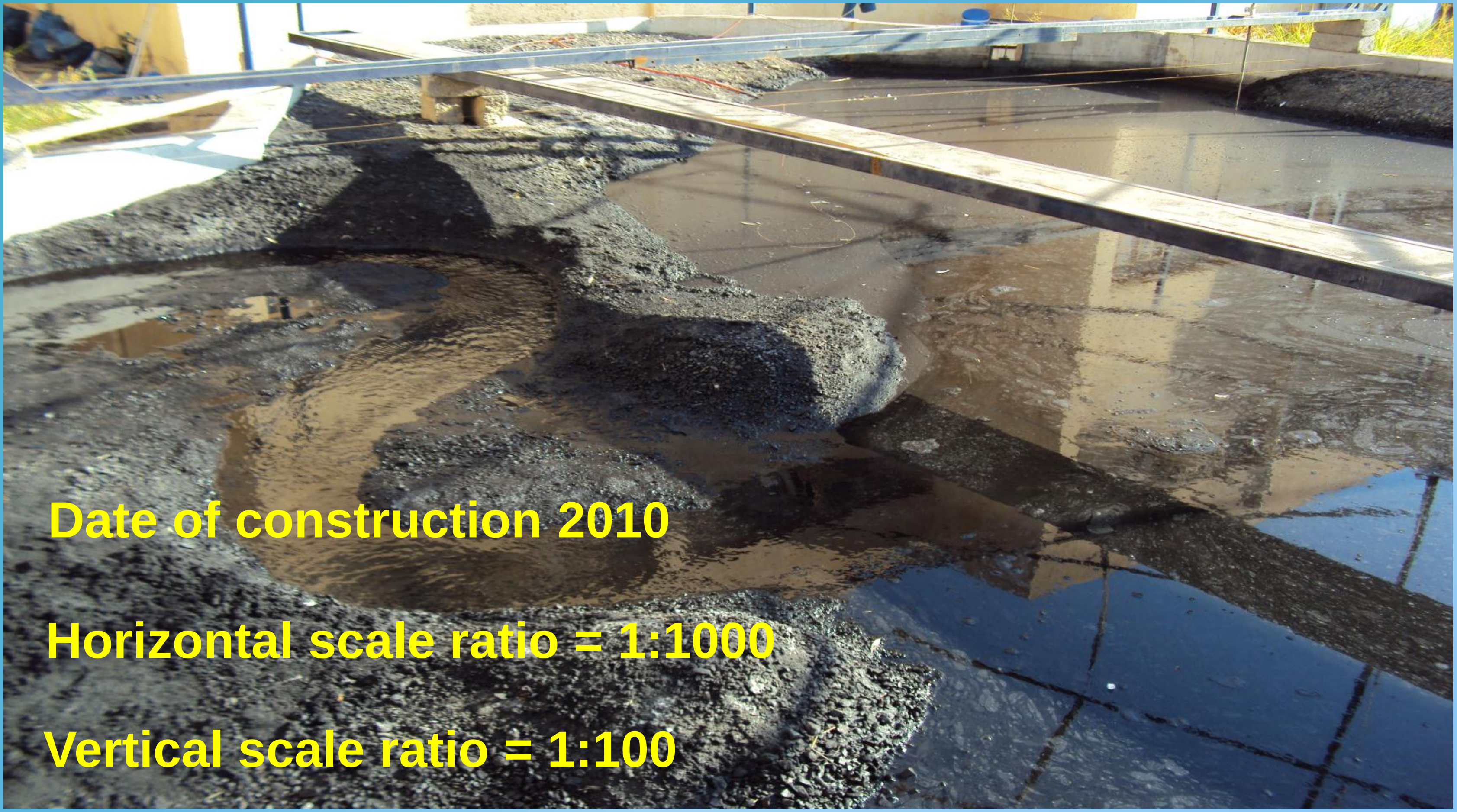

III. EXPERIMENTAL INVESTIGATION

1. The physical hydraulic model

1- Earth tank.
2- Suction pipe.
3- Pump.
4- Valve.
5- Downstream sump.
6- Delivery pipe.
7- Return pipe.
8- Downstream sluice gate.
9- Measuring carriage.
10- Sediment feeder.
11- Point gage.
12- Upstream tank.
13- Upstream sluice gate.
14- Strainer.
15- Over flow pipe.

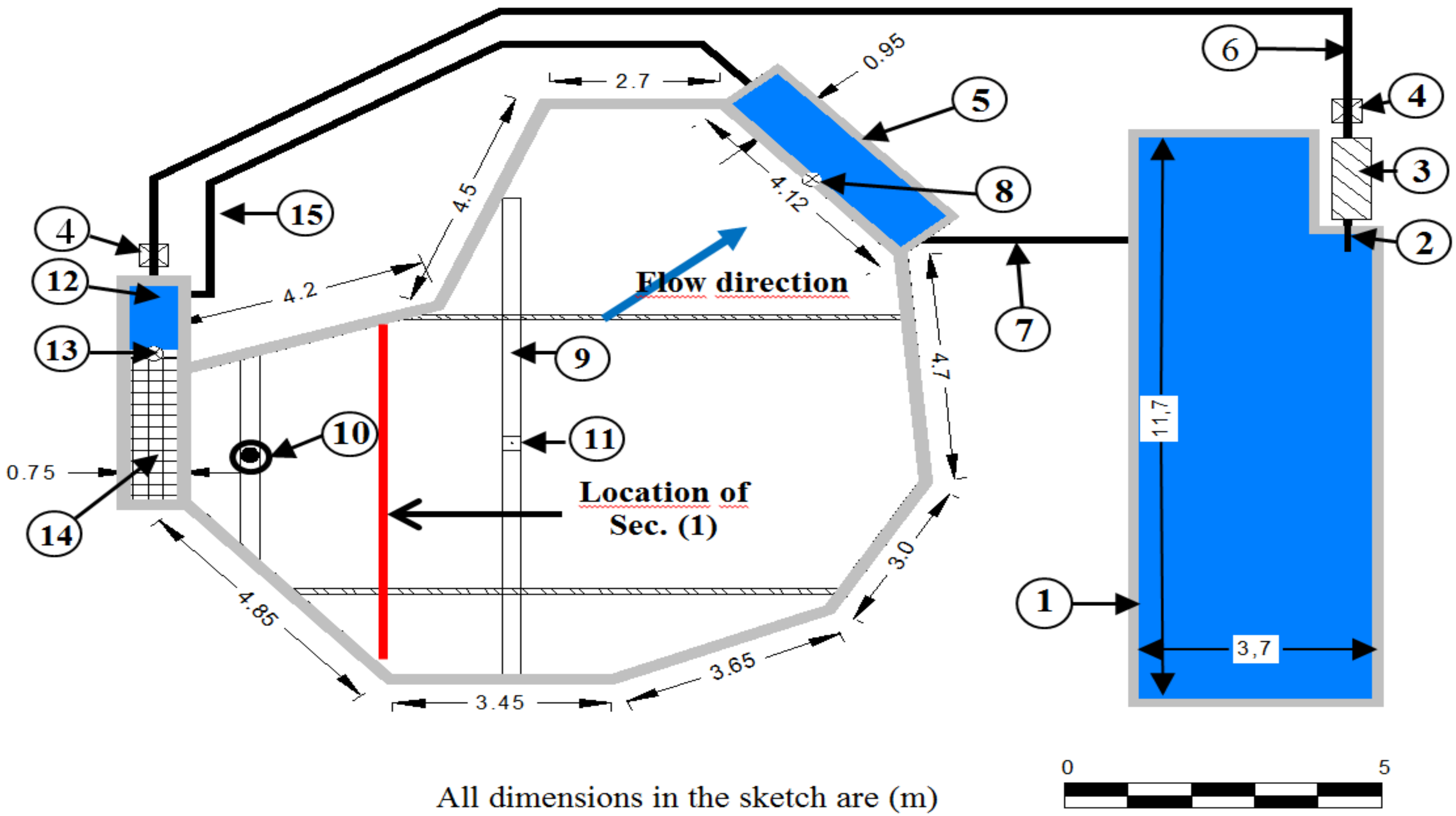

Figure 2: Schematic diagram of the physical model

III. EXPERIMENTAL INVESTIGATION

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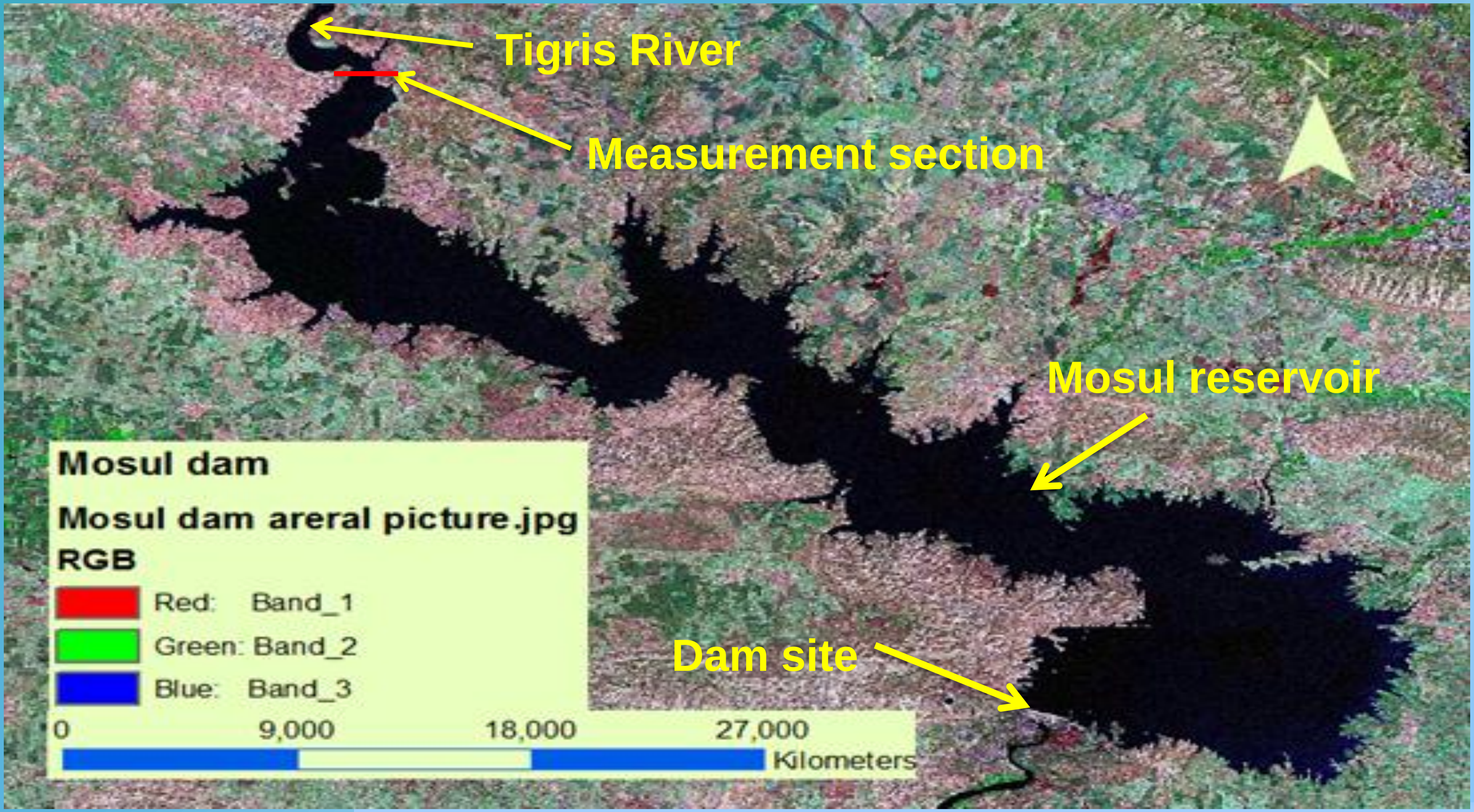


III. EXPERIMENTAL INVESTIGATION

2. The Experiments

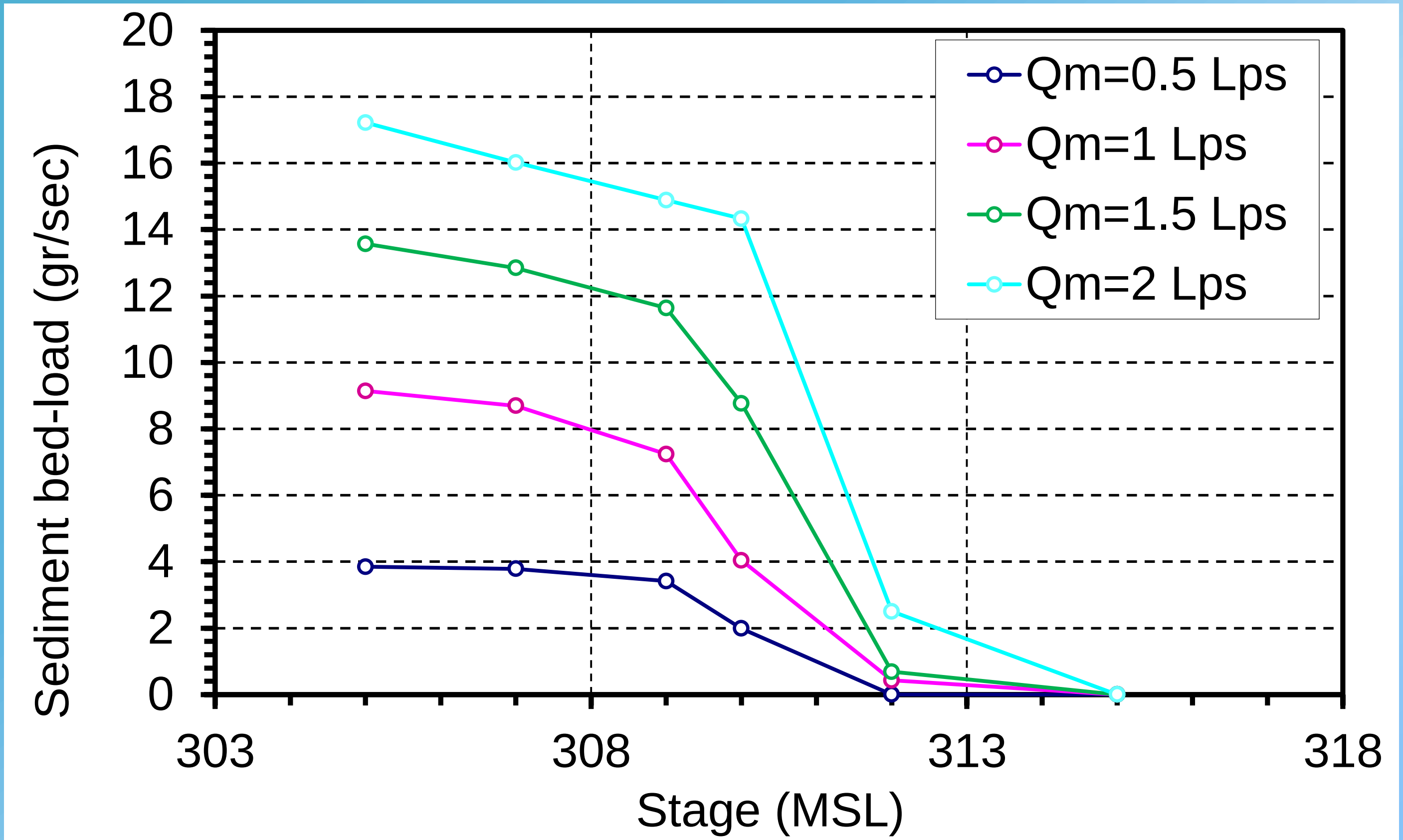
$$q_s = \frac{w}{T}$$

Discharge in model (lps)	0.5	1.0	1.5	2.0
Discharge in prototype (m^3/sec)	500	1000	1500	2000
Water level in prototype (MSL)	Bedload at Sec. (1) (g/sec)			
305	3.848	9.143	13.571	17.22
307	3.787	8.695	12.846	16.02
309	3.417	7.24	11.636	14.887
310	1.987	4.04	8.767	14.33
312	0.0009	0.427	0.686	2.502
315	0.00009	0.0001	0.0001	0.0007

IV. RESULTS AND DISCUSSION

1. Impact of water level on the bed-load rate

2.Impact of upstream water discharge on the bed-load rate

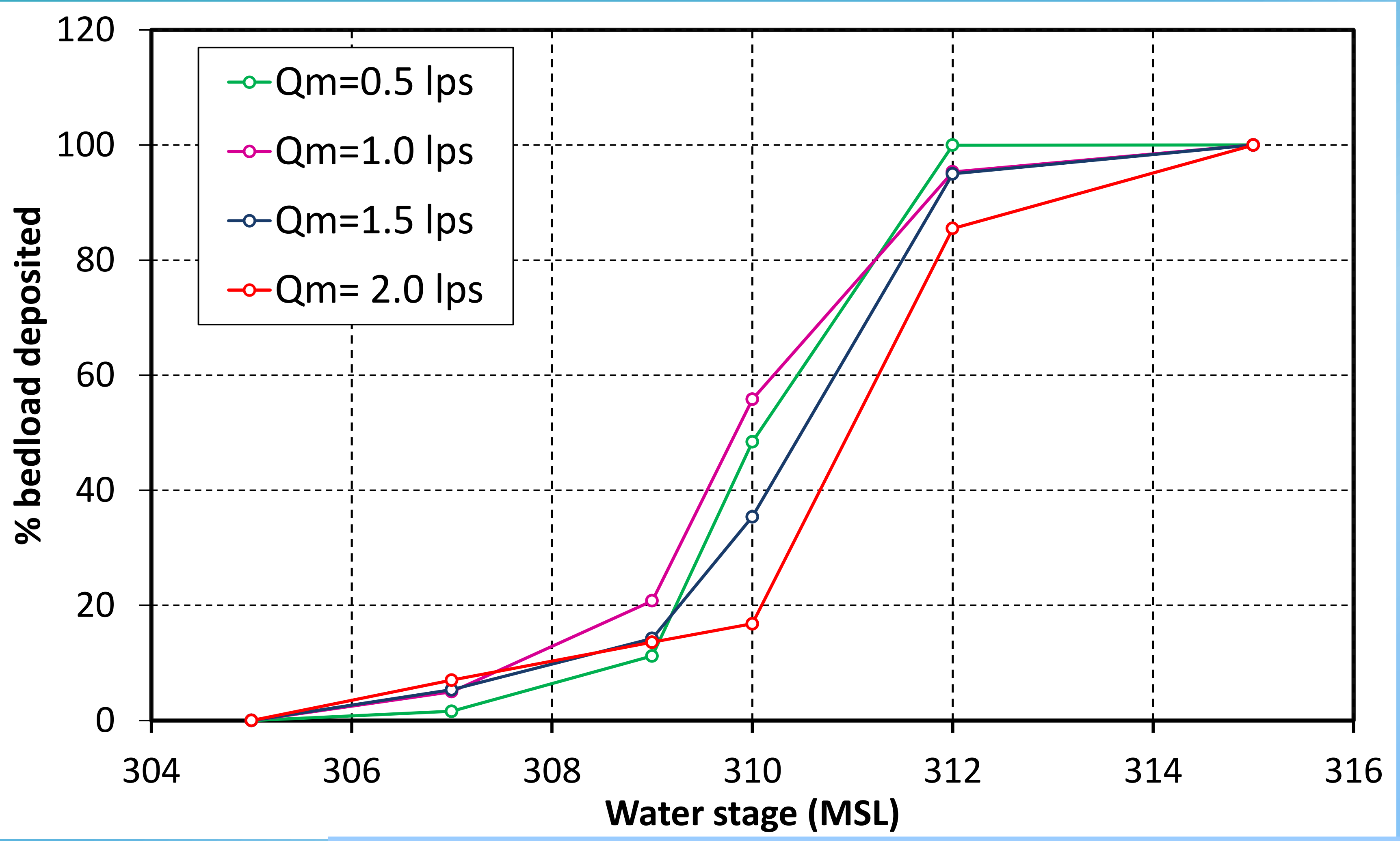


IV. RESULTS AND DISCUSSION

$$\% \ q_{sd} = \left(\frac{q_{s_{305}} - q_{s_i}}{q_{s_{305}}} \right) \times 100,$$

Discharge in model (lps)	0.5	1.0	1.5	2.0
Discharge in prototype (m^3/sec)	**500**	**1000**	**1500**	**2000**
Water level in prototype (MSL)	**Percentage bedload deposited % at Sec.1**			
305	0	0	0	0
307	1.6	5	5.35	7
309	11.2	20.8	14.26	13.6
310	48.4	55.8	35.4	16,8
312	99.977	95.33	95	85.5
315	99.998	99.998	99.999	99.995

IV. RESULTS AND DISCUSSION



V. CONCLUSION

- Sediment transport rate is directly related to the water stage.
- The physical model can be used for future prediction of bed-load rate within that area. It can be used as a guide for operation rules.
- The increase of out flow from reservoir without any increase of the inflow from the River Tigris causes an increase in sediment transport rate entering the reservoir.

V. CONCLUSION

- Keeping the water level within the reservoir during the flood period as high as possible will reduce the amount of sediment entering the reservoir.