

Graphical Integration

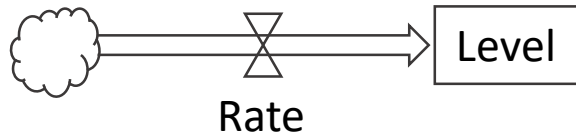
Environmental Systems #3

Marburg Open Educational Resources

Thomas Nauss & Christoph Reudenbach

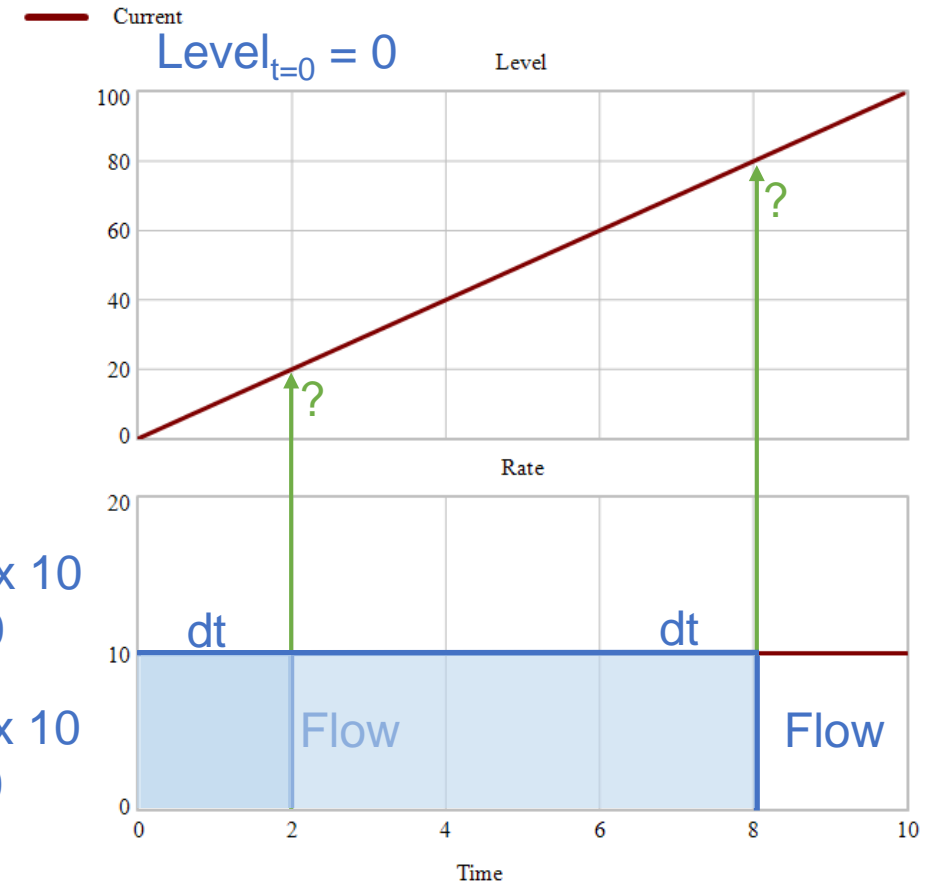


Estimation of Quantitative Information from Graphical Models

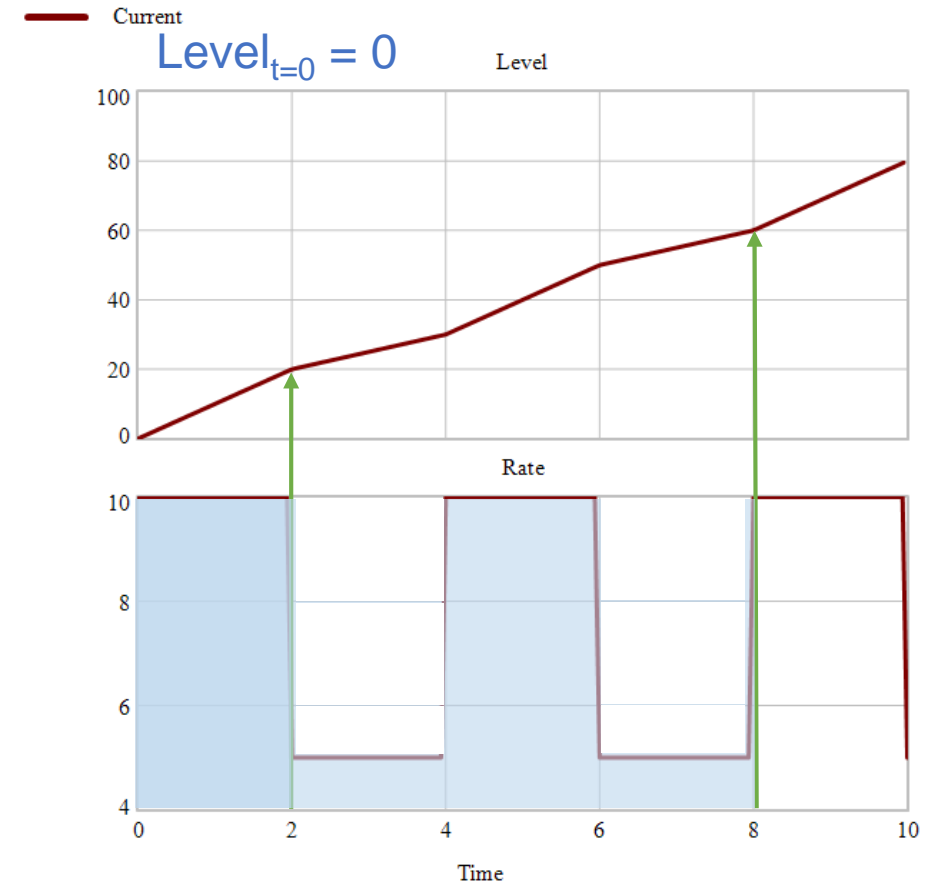
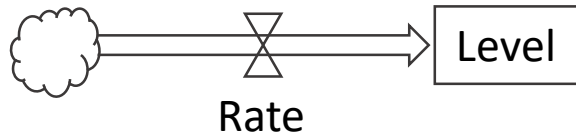


$$\text{Level}_{t=2} = 2 \times 10 = 20$$

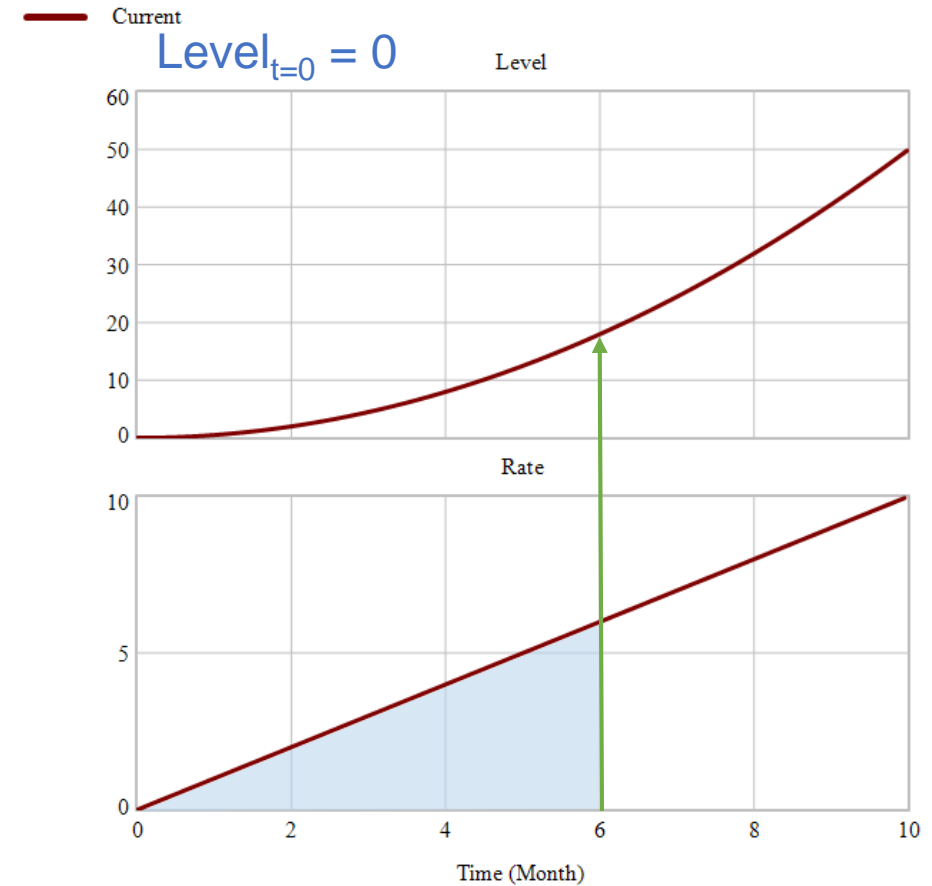
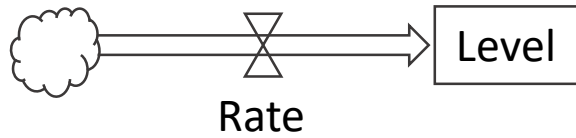
$$\text{Level}_{t=8} = 8 \times 10 = 80$$



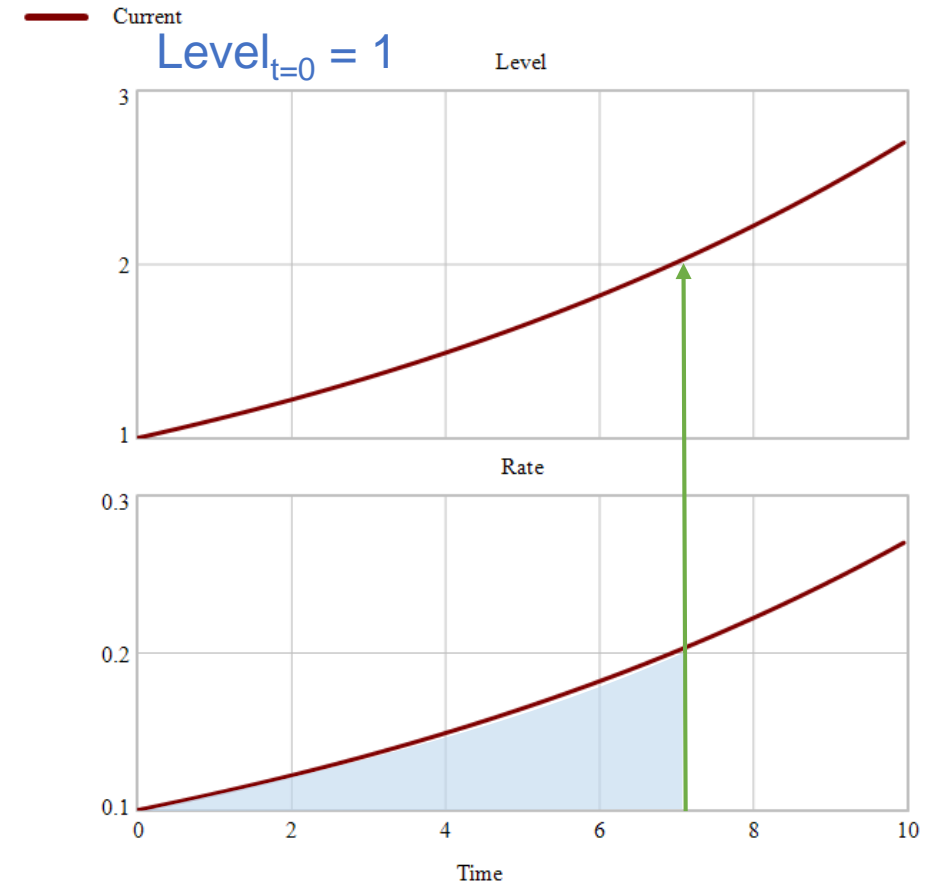
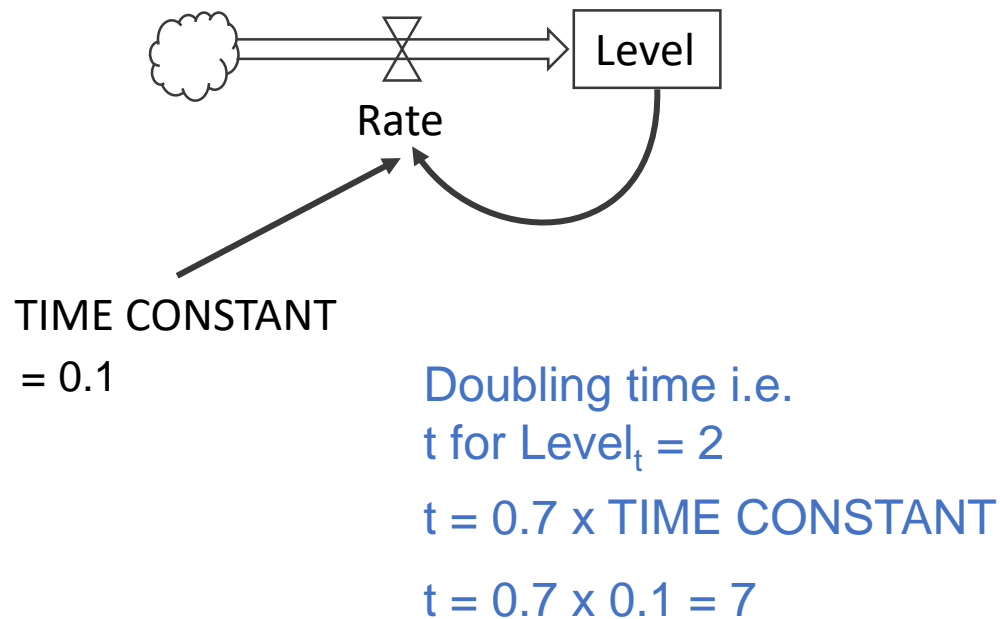
Estimation of Quantitative Information from Graphical Models



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Estimation of Quantitative Information from Graphical Models

- Area under the rate line equals the level
- Gradient of the level equals the rate
- Positive feedback has
 - an exponential growth rate
 - a constant doubling time of the rate
 - a doubling time of $0.7 / \text{time constant}$
- Negative feedback has
 - an asymptotic behavior
 - a constant halving time of the rate
 - a halving time of $0.7 \times \text{time constant}$
 - a halving time of $0.7 / \text{draining fraction}$

Difference time constant / draining fraction:
Level is multiplied by the draining fraction but divided by the time constant

