



Influent Generator for Probabilistic Modeling of Nutrient Removal Wastewater Treatment Plants

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Outline

- **Introduction**
- Targets
- Methodology
- Results
- Conclusion and next steps



Influent Generator for Probabilistic Modeling ... (Talebizadeh *et al.*)

Introduction

Previous studies

- Regression models (Rousseau *et al.*, 2001)
- Univariate time series models (Martin *et al.*, 2007)
- Phenomenological models (Gernaey *et al.*, 2011)

Influent Generator for Probabilistic Modeling ... (Talebizadeh *et al.*)



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Targets

Development of a dynamic influent generator

- ✓ High temporal resolution (15-minutes)
- ✓ Same statistical properties as the observed time series
- ✓ Needs only basic information
- ✓ Not computationally-expensive

Influent Generator for Probabilistic Modeling ... (Talebizadeh *et al.*)



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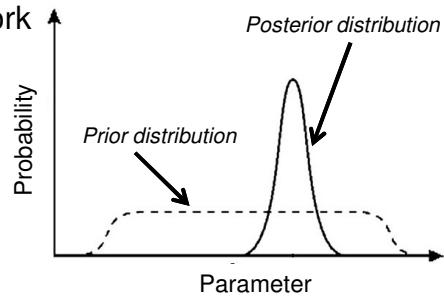
Influent Generator for Probabilistic Modeling ... (Talebizadeh *et al.*)



Methodology-WWF



- Bayesian model calibration
 - Assigning an initial distribution to uncertain model parameters (Prior distribution)
 - Updating the prior distribution using a Bayesian framework



Influent Generator for Probabilistic Modeling ... (Talebizadeh et al.)

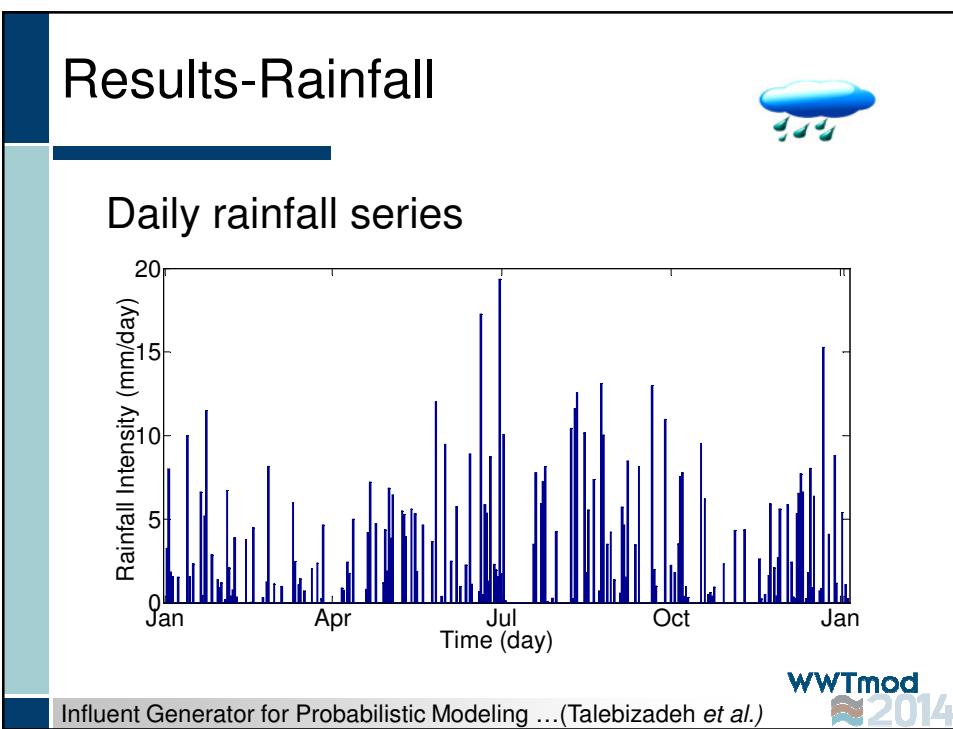
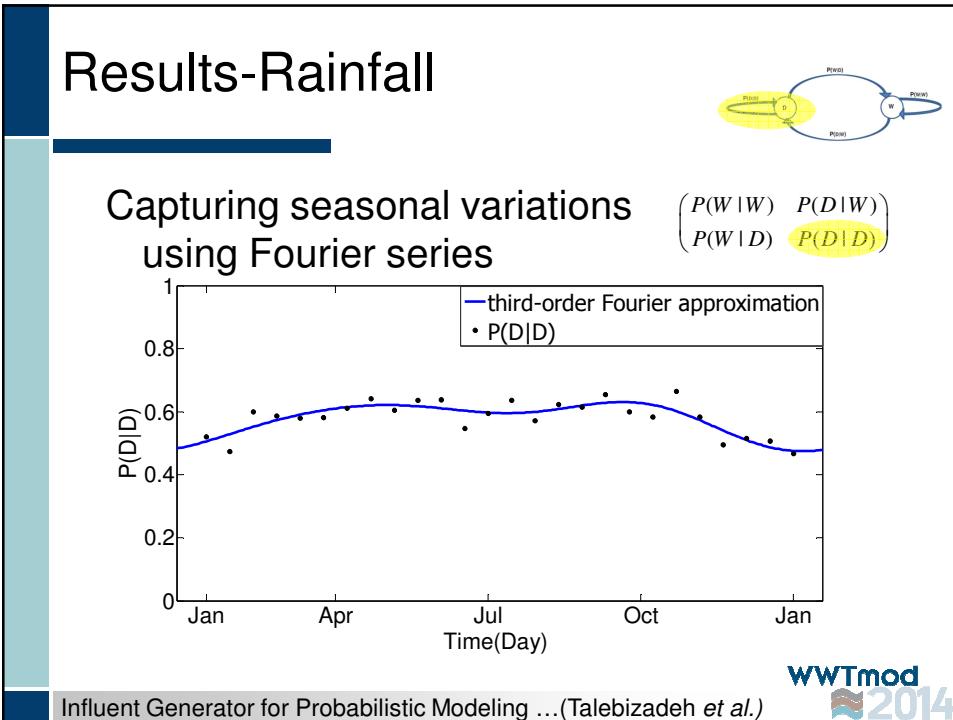
WWTmod
2014

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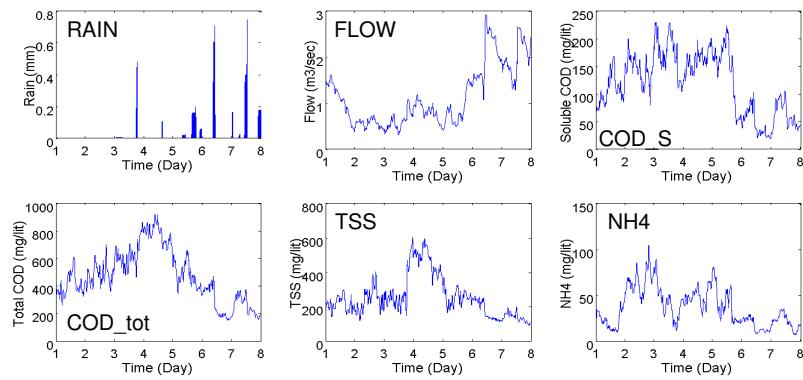
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Results-Random generation

Time series of 1 week of generated data



WWTPmod
2014

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WWTPmod
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Influent Generator for Probabilistic Modeling ... (Talebizadeh et al.)

