ProdRisk

Brukermøtet 2023

Teknologi for et bedre samfunn

Overview

- Current team
- Multi-market functionality
- In progress: Redesign of ProdRisk documentation
- IMPRO
- ProdRisk version life cycle

Team ProdRisk

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Multi-market functionality

- Reserve markets: up- and down regulation

- Reserve allocation is part of the weekly optimization problem, reserve sales enter into water values

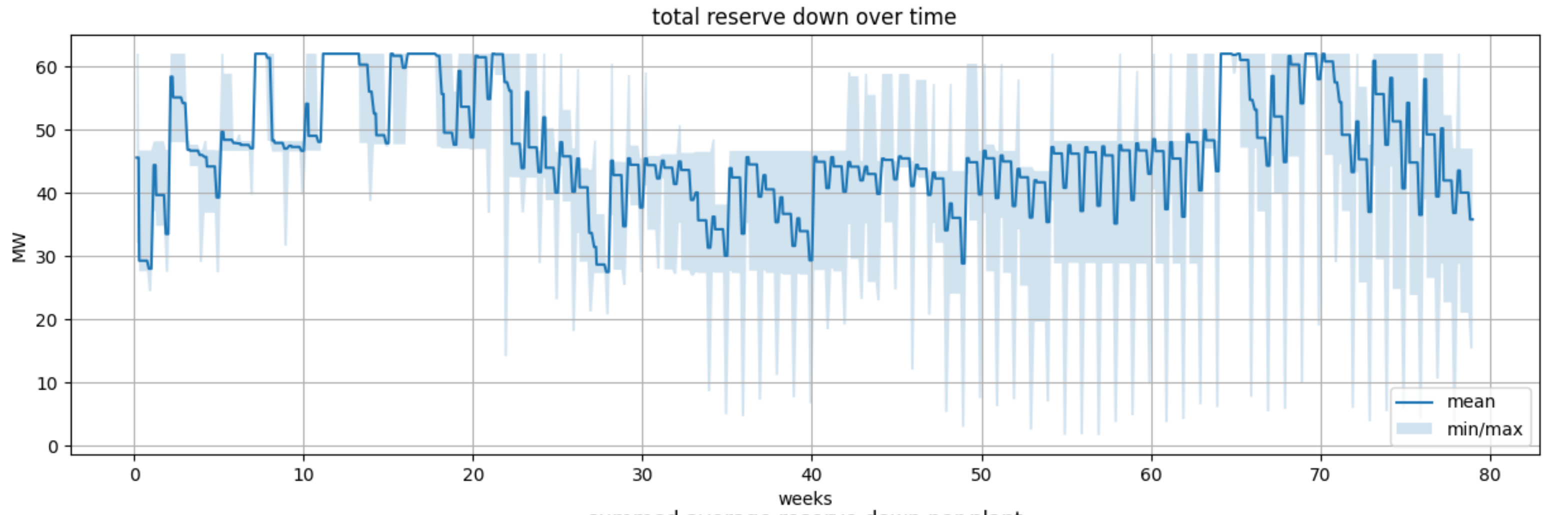
- Fully accessible in the API

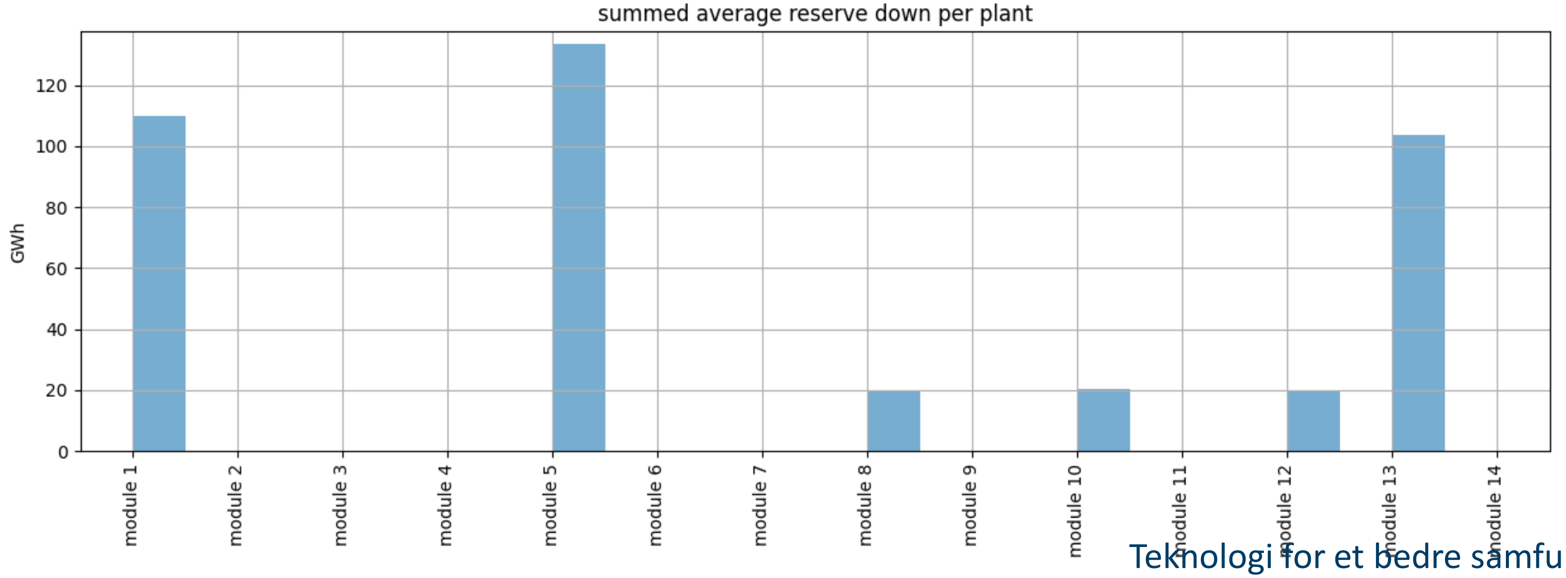
- Included in ProdRisk 10.6.0

- **Licensed functionality**
  - Contact us if you want to purchase

Multi-market functionality

- Assumptions:
  - Deterministic price
  - Sales on all markets at the same time (spot price periods)
  - No activation of reserves



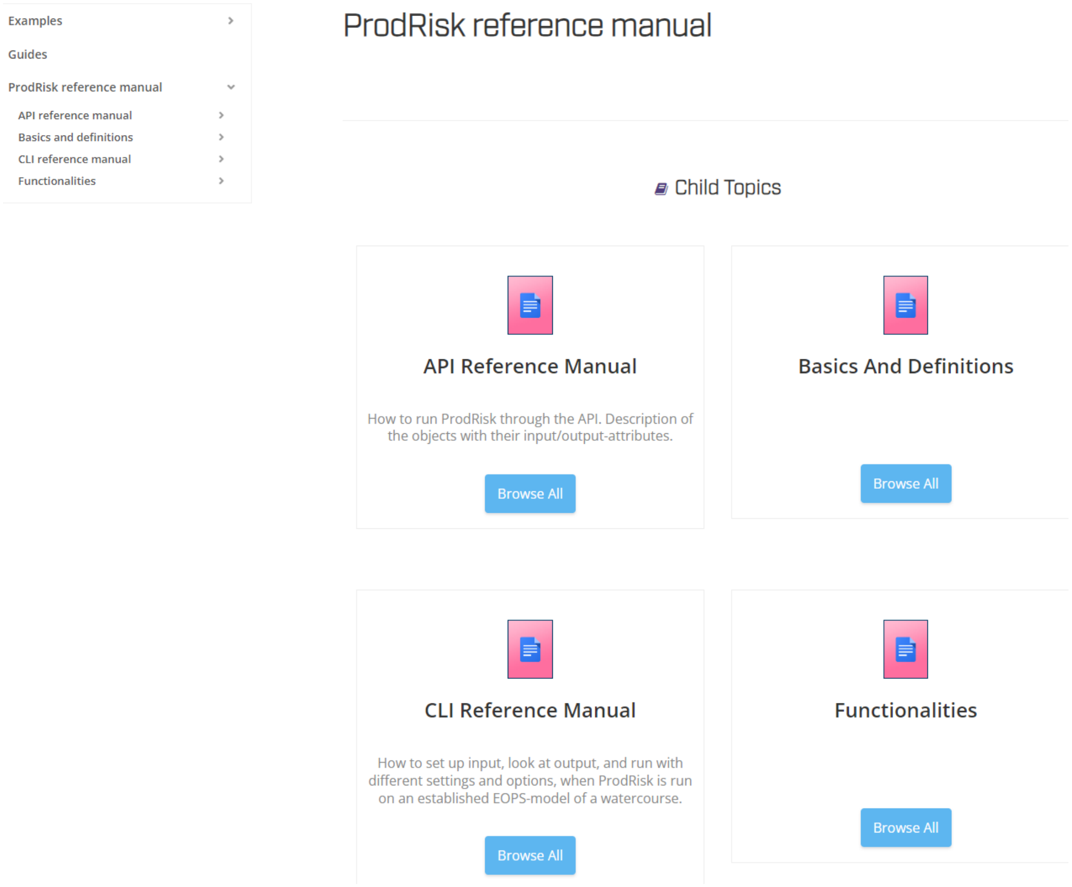


Multi-market functionality

- All inputs/outputs time dependent
- Input
  - Obligation
  - Market capacity
  - Reserve prices (deterministic)
  - Max. reserve allocation
  - Adjustable penalty values
- Output
  - Reserve allocation per module
- Computation time: ca 10-20% increase

Redesign of documentation

Present:



ProdRisk reference manual

Child Topics

API Reference Manual

How to run ProdRisk through the API. Description of the objects with their input/output-attributes.

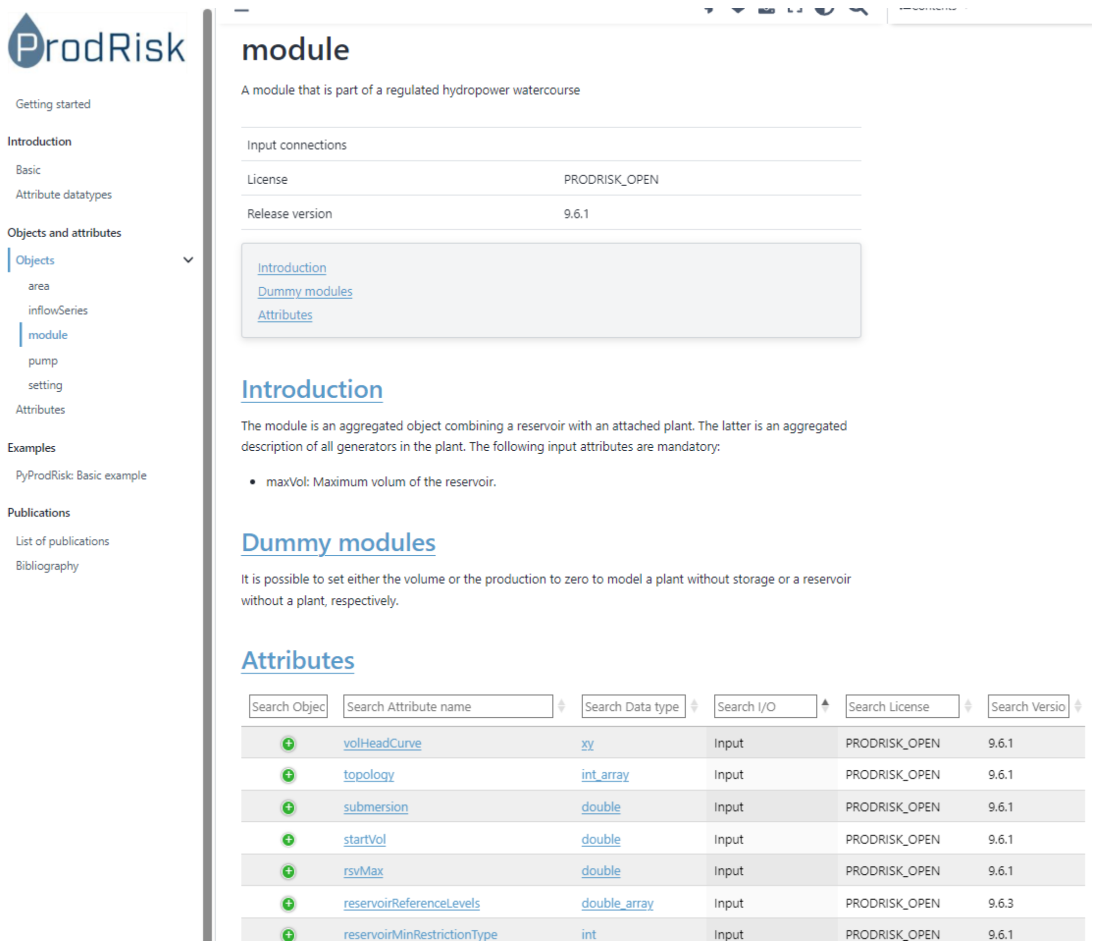
Basics And Definitions

CLI Reference Manual

How to set up input, look at output, and run with different settings and options, when ProdRisk is run on an established EOPS-model of a watercourse.

Functionalities

New:



module

A module that is part of a regulated hydropower watercourse

Input connections	
License	PRODRISK_OPEN
Release version	9.6.1

Introduction
Dummy modules
Attributes

Introduction

The module is an aggregated object combining a reservoir with an attached plant. The latter is an aggregated description of all generators in the plant. The following input attributes are mandatory:

- maxVol: Maximum volum of the reservoir.

Dummy modules

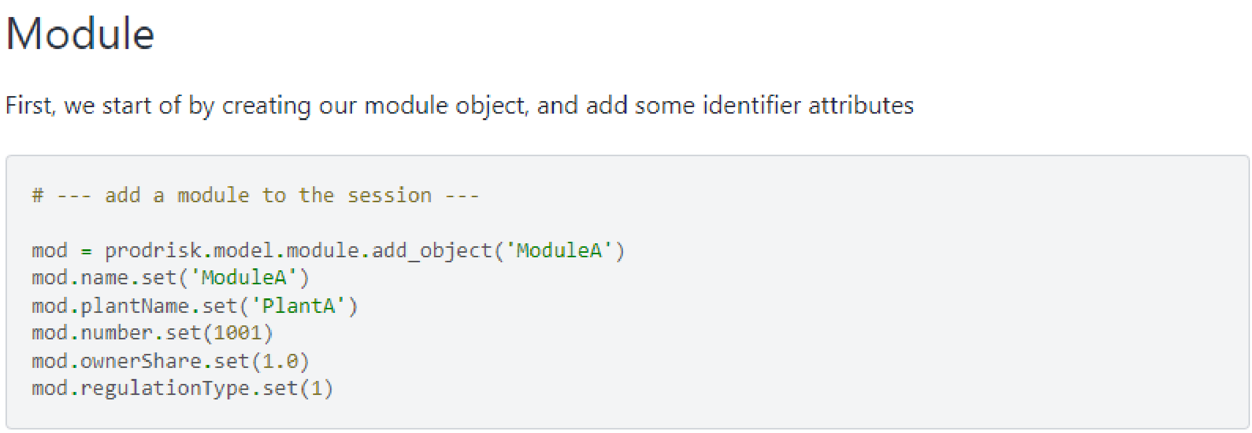
It is possible to set either the volume or the production to zero to model a plant without storage or a reservoir without a plant, respectively.

Attributes

Search Objec	Search Attribute name	Search Data type	Search I/O	Search License	Search Versio
⊕	volHeadCurve	xy	Input	PRODRISK_OPEN	9.6.1
⊕	topology	int_array	Input	PRODRISK_OPEN	9.6.1
⊕	submersion	double	Input	PRODRISK_OPEN	9.6.1
⊕	startVol	double	Input	PRODRISK_OPEN	9.6.1
⊕	rsvMax	double	Input	PRODRISK_OPEN	9.6.1
⊕	reservoirReferenceLevels	double_array	Input	PRODRISK_OPEN	9.6.3
⊕	reservoirMinRestrictionType	int	Input	PRODRISK_OPEN	9.6.1

Redesign of documentation

- Cover currently missing topics
- Interactive / VLAB integration
- Improved navigation
- Automated update process
- More alike your experience on the SHOP portal



Module

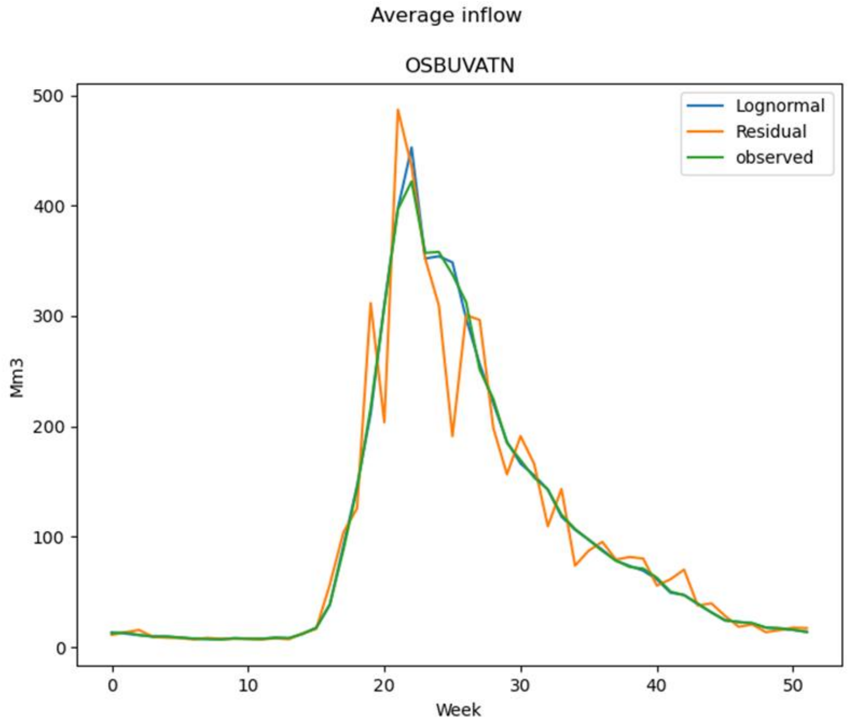
First, we start of by creating our module object, and add some identifier attributes

```
# --- add a module to the session ---

mod = prodrisk.model.module.add_object('ModuleA')
mod.name.set('ModuleA')
mod.plantName.set('PlantA')
mod.number.set(1001)
mod.ownerShare.set(1.0)
mod.regulationType.set(1)
```

IMPRO

- Develop an inflow model for ProdRisk that satisfies all mathematical requirements and
  - Avoids negative inflows
  - Improves the representation of prolongued extreme inflow situations
- Explore the effect of the new inflow model on the convergence in ProdRisk
- Operationalise a prototype and documentation



Phase 1: Literature study and experimentational development

Phase 2: Implementation in ProdRisk and testing on user cases

Phase 3: Operationalisation

End of project: December 2024

Prodrisk version life cycle improvements

- Extremely important upgrades of development infrastructure and focus on building a solid foundation (examples next page).
- Goal is to create more efficient and reliable processes which meets modern day expectations/standards and yield higher quality releases more frequently.

- We hope you will share this experience in the coming releases.

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Prodrisk version life cycle improvements

- Ongoing or completed objectives:
  - Transitioning to gitlab (this has been a process and enabler and is practically related to many of the other points).
  - Migrating, adapting and improving existing test system.
  - Adding test pipeline on Linux.
  - Building and adopting new practices, new internal fora and workflows.
  - Learning, adopting and sharing experiences and processes from vLab, SHOP and LTM .

- Future objectives:
  - Use the new infrastructure to create further improvements (more automation, new documentation, more information on the portal.)
  - Fine tune new infrastructure to make what is good better and to allow further new elements.
  - Increased focus on Linux, expand testing by adding to test system.
  - *Expand current test system.*
  - "Everything" is up for evaluation, fit for purpose.

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