Considerations and technologies for building a buoy information system at NTL LTER

North Temperate Lakes LTER

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0.38,7.82,6

Components

- Sensors on buoys
- Data loggers
- Communication between loggers and station
- Middleware for data streaming
- System monitoring tools
- Database
- Data access tools

Considerations

- Reliability in field
- Provide access to data for site researchers
- Metadata
- Funding and collaborations
- Functionality provided by networks – leveraging efforts, contributing efforts
- User and developer base – sustainability
- Flexibility - standards implementation
- Ease of implementation

Data Streaming

- Ziggy
  - Fairly reliable in remote field
  - Reads various logger file styles
  - Parses into one data model (Vega)
- DataTurbine server
  - Reliability is an afterthought
  - Variable inputs
  - Parses into two basic data models (matrix & parameter value)
  - Provides real time data stream monitor (Real time data viewer)

Data Models

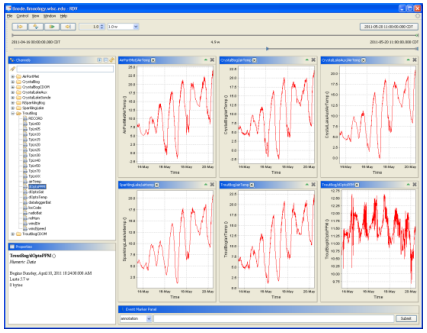
- NTL
  - Matrix style tables – one column of values per parameter
  - EML described
  - No standardization
- GLEON
  - VEGA – parameter-value style
  - Metadata associated with each data series or stream
  - Controlled vocabulary for parameters
- CUAHSI
  - ODM – parameter-value style
  - Metadata associated with each value
  - Controlled vocabularies

Data Access

- Custom NTL query system based on EML
  - One system for all NTL data sets
  - User friendly
  - Extensively used by site researchers as well as others
- DBbadger, Vader
  - Tightly integrated with VEGA
  - User friendly
  - Graphing, comparing
- HydroDesktop, HydroExcel
  - Access WaterOneFlow webservices
  - Querying, graphing, analysis
- Kepler workflow system
  - Highly flexible query or accessing DataTurbine streams
  - Highly technical, not user friendly
  - Graphing, analysis, modeling

DataTurbine

Permanent
Data Storage



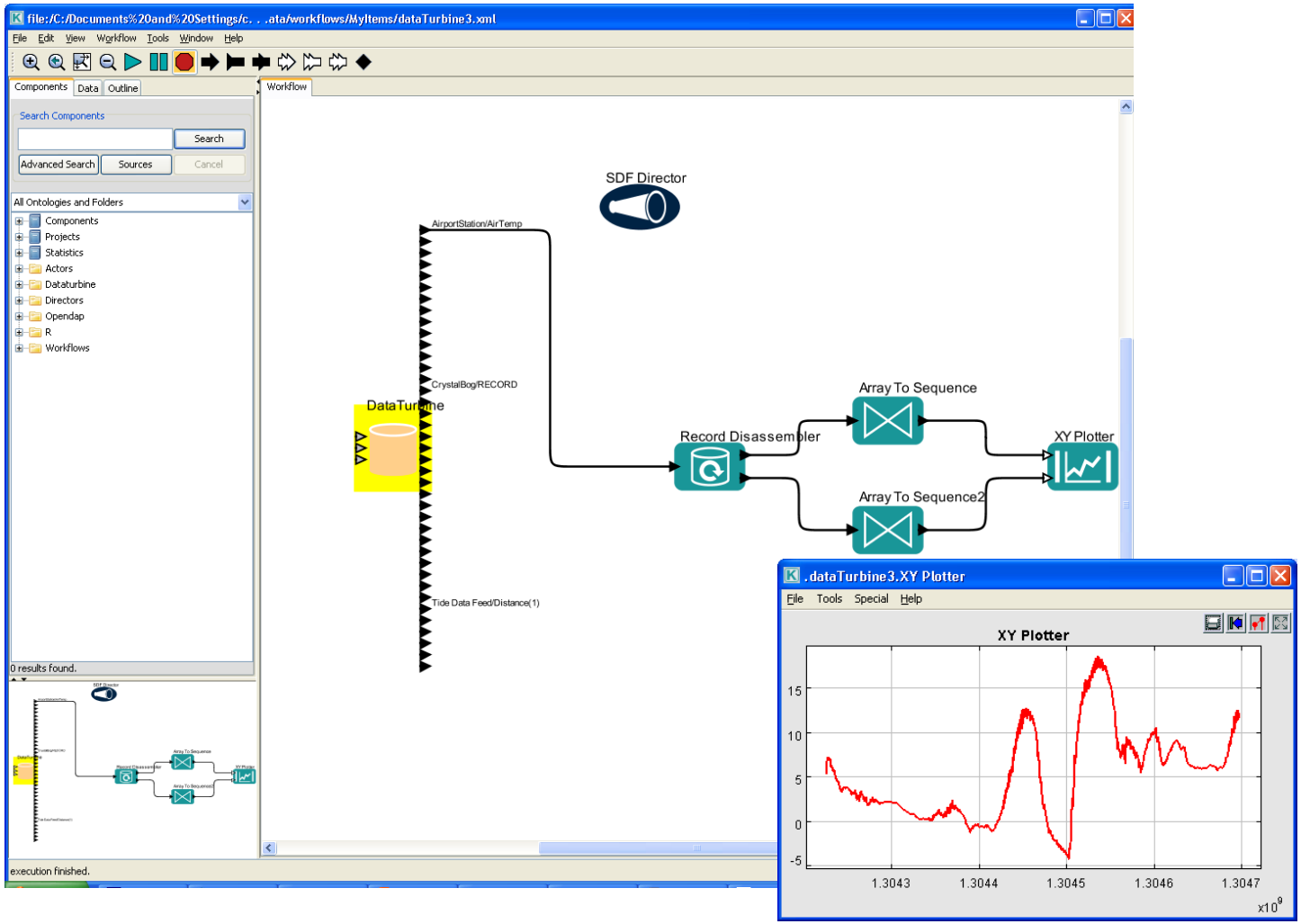
Sensors

Data Transmission

DataTurbine

Data Storage
Monitoring

- Kepler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Search Components
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AirportStation/AirTemp
CrystalBog/RECORD
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Array To Sequence2
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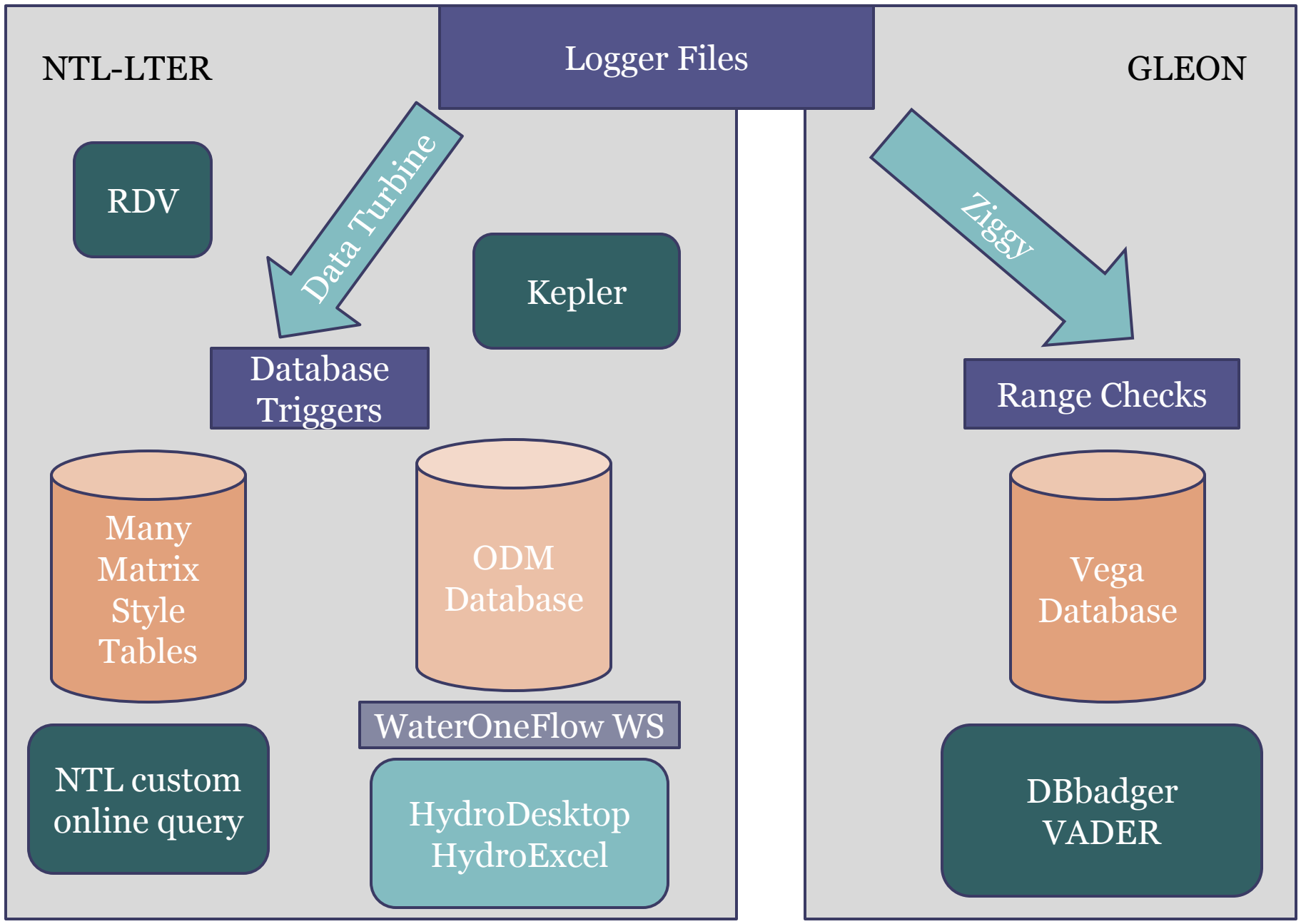
NTL-LTER
Logger Files
GLEON
RDV
Data Turbine
Kepler
Ziggy
Database Triggers
Range Checks
Many Matrix Style Tables
ODM Database
Vega Database
WaterOneFlow WS
NTL custom online query
HydroDesktop HydroExcel
DBbadger VADER