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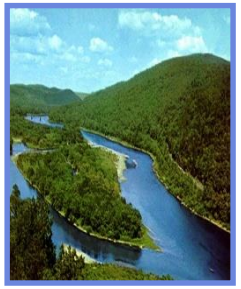
Advancing the management of water resources

New/Watauga River Basin Hydrologic Model - Kickoff Meeting April 10, 2018



Steven Nebiker

Who and What is HydroLogics?

- 10 people, 4 states
- In business since 1985
- Specialties: hydrology, modeling, systems analysis, operations research
- Developers of OASIS
- Services:
  - Water allocation/conflict resolution
  - Risk/drought management
  - Water supply planning
  - System operations

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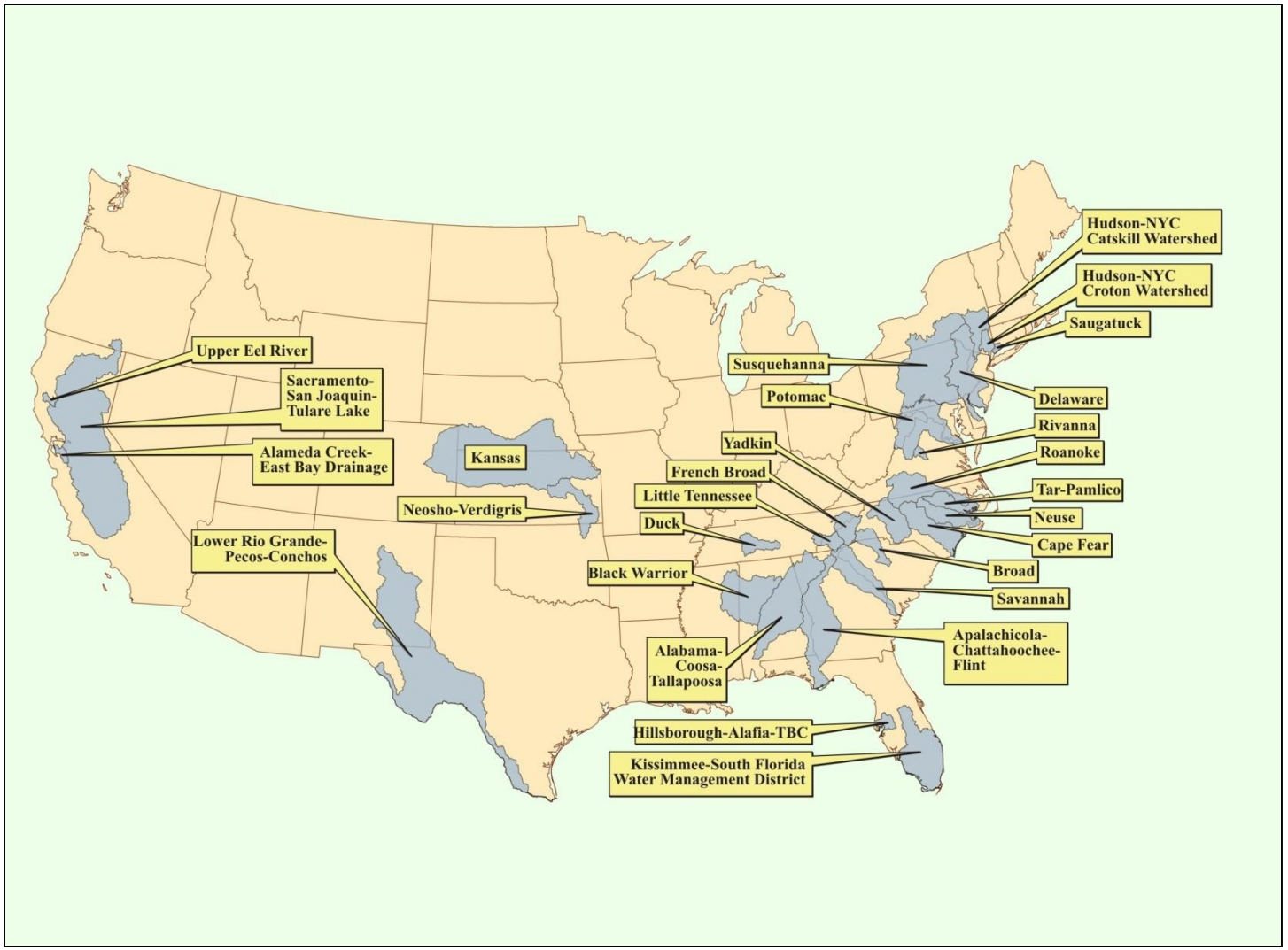
Small Firm – Broad Reach



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What is OASIS?

- A patented, mass balance, water resources simulation/optimization model
  - Runs quickly on a long-term hydrologic record
  - Can model virtually any flow prescription or operating policy
  - Uses real-time forecasts for probabilistic operations
- Same model for:
  - Alternatives evaluation (planning)
  - Real-time operations
  - Gaming

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Model Input

- Time series of unregulated inflows
- Time series of net evaporation
- Physical data (reservoir SAE, turbine characteristics, channel capacities, etc.)
- Operating Policies, e.g.
  - Rule curves
  - Minimum releases/ecological flows
  - Drought and flood management policies
  - Energy requirements

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Model Output

- Tables and Graphs of
  - Flow
  - Elevation, and
  - *Derived attributes,* e.g.habitat availability, energy, revenue, water supply shortages, recreation days

for every time step

at every point in the system

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Alternatives Evaluation

A major purpose of OASIS is to compare alternatives. That is, to compare the performance of alternative sets of facilities, demands, and operating policies over the whole range of the hydrologic record.

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Concept of Basin Hydrologic Model

A basin-wide model of the New and Watauga Rivers at the finest practical geographic resolution and timestep.

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Possible Uses:

1. Evaluation of the combined effects of municipal water supply plans
2. Evaluation of interbasin transfer permit applications
3. Development of individual water supply plans – model will be on the DWR server and available to stakeholders and their consultants
4. A platform for developing risk-based drought plans.

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Data

- Majority of data collection to be performed by HDR
- HydroLogics responsible for collecting data on streamflows and system operations (reservoirs, drought plans, etc.)

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Project Timeline

- 9 month timeframe
- Components
  - Basin schematic: 1 - 2 months
  - Data collection (HDR): 2 - 3 months
  - Inflow development: 2 - 3 months
    - Verification
  - Operating rules: 2 months
  - Basecase run (current conditions): 2 - 3 months
  - Documentation and training: 1 month
  - **Expected completion date: November 2018**
- Accelerated timeline for preliminary modeling results (and drought forecasts): 3 - 4 months

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Demonstration of Neuse Hydrologic Model

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