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Availability of Ground Water Resources in the Piscataqua and Coastal Watersheds, Chormann, R

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Availability of Ground Water Resources in the Piscataqua and Coastal Watersheds, Southeastern, New Hampshire

A Report to

The New Hampshire Estuaries Project

Submitted by

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This report was funded in part by a grant from the New Hampshire Estuaries Project, as authorized by the U.S. Environmental Protection Agency pursuant to Section 320 of the Clean Water Act.

The following report summarizes progress on the the various components of the Availability of Groundwater Resources in the Piscataqua and Coastal Watershed poject and the status of deliverables as of June 30, 2004. Most tasks have been completed under this "data collection" phase of the overall, multi-year project, although some activities will continue simultaneously with the "data analysis" phase.

Monitoring Well Network Expansion:

- The expansion of the state's monitoring well network, as proposed by the NH Geological Survey (NHGS), was not included in the conference bill of the Capitol Budget Committee during the 2003 legislative session. However, we are continuing to perform information and outreach to the state legislature as well as other interested groups in New Hampshire regarding the network. Currently, NHGS and DES Water Supply Staff have put together recommendations to a legislative subcommittee charged with studying the state's water resources, and the expanded monitoring network was the number one recommendation listed as needed for the state to enhance its ability to monitor the state's water resources. NHGS will continue to coordinate with other bureaus of NHDES to help educate water study committees sponsored by the legislature about the state's need for improved water monitoring infrastructure.

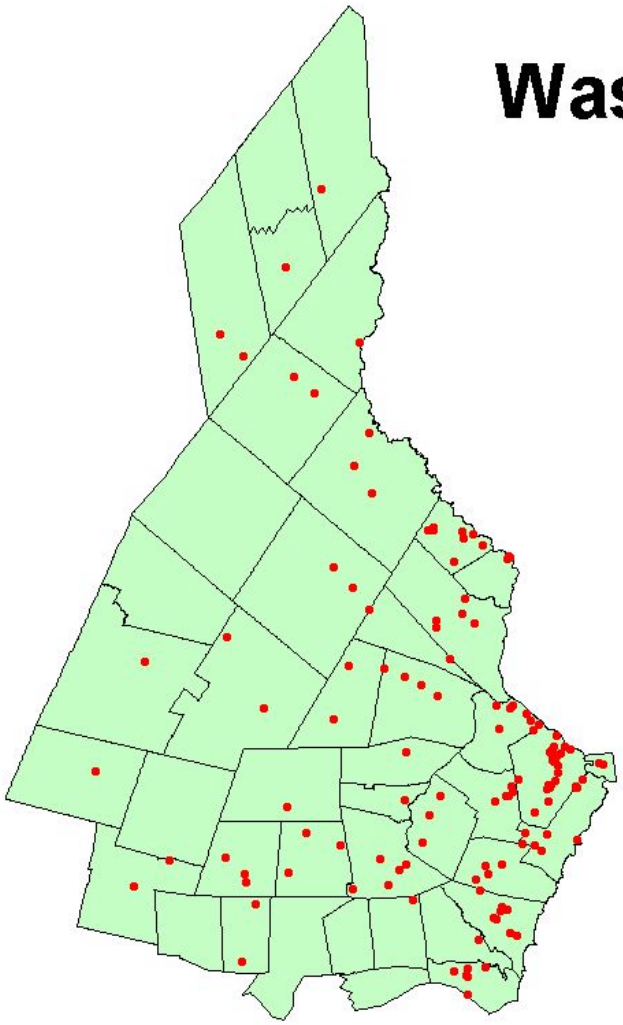
Data Mining:

- Contact with other programs within DES is ongoing to establish the flow of pertinent data to the project database. Provisions for future electronic deliverables are being encouraged by all parties involved from outside and inside sources. However, it is likely that pertinent electronic deliverables will not be available in the near future. Therefore, manual entry of data will be necessary. The project database is being adjusted to accommodate the intended design of these future datasets, connection to a data warehouse and providing internet access to the data. Additional adjustments to the database are anticipated based upon accommodations to other programs using the data and possible integration of existing electronic legacy data. These adjustments, however, should be easily integrated.

- The database front-end, or data entry/viewing/editing forms, has largely been completed and is in final testing/redesign phase. The redesign of the front-end is necessary to accommodate the changes to the database mentioned in the previous task.

- Data from several sources has been compiled in electronic format and has been loaded into GEOLOGS. These include 577 borings from the Department of Transportation and 9900 wells from the USGS Groundwater Site Inventory. Additionally, 1162 wells/borings, compiled by 2 interns during summer 2003, from project files maintained by the Waste Management Division have been processed and are currently ready for upload into GEOLOGS.

- A part-time, temporary Environmental Technician position was created and advertised and 7 well-qualified candidates were interviewed. The position has been offered and the successful candidate is scheduled to begin work during the first week of July 2004.



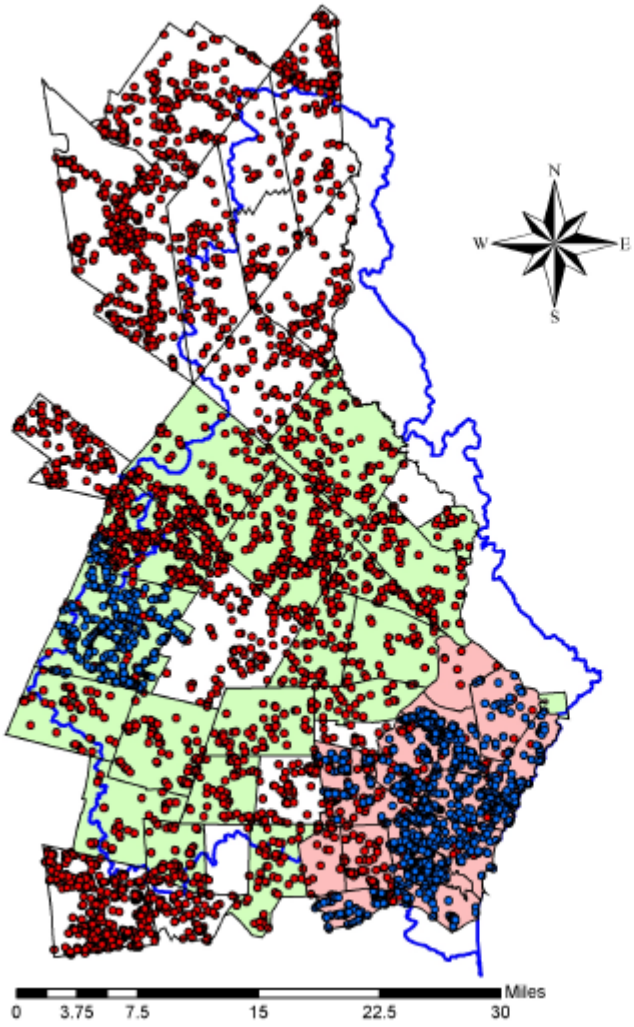
Waste Sites Reviewed

● Site Location

1162 wells / boreholes
at 131 sites
as of June 30, 2004

Supplemental Well Inventory:

- 32l tax map and parcel GIS data sets obtained
- 1465 wells plotted utilizing desktop method



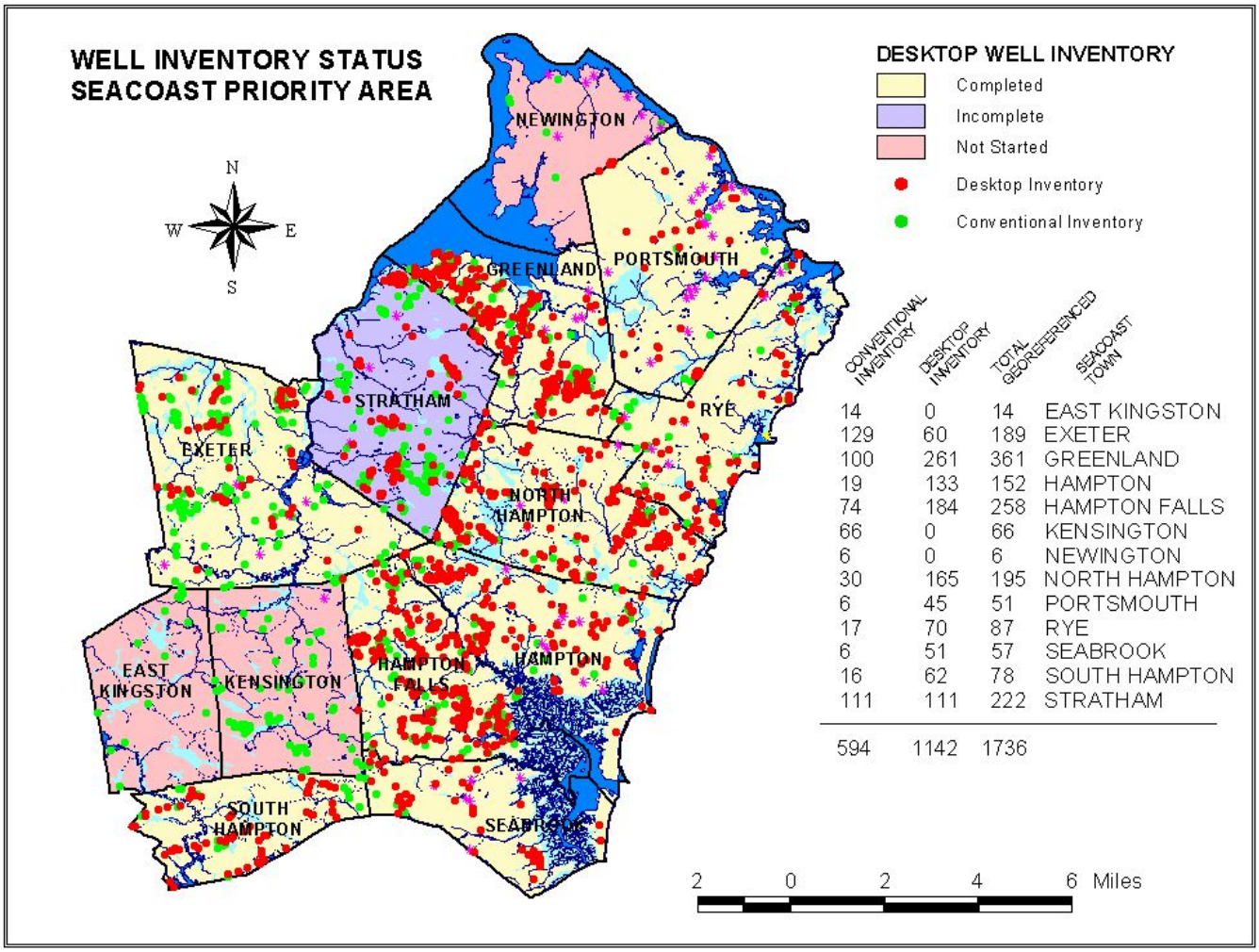
SEACOAST PROJECT
WELL INVENTORY STATUS

- Desktop Well Location (1465 Wells)
- Conventional Well Location (4508 wells)
- Salmon Falls / Piscataqua Basin
- Parcel Data Obtained
- Seacoast Project Towns
- Priority Towns

323	DEERFIELD
60	EXETER
261	GREENLAND
133	HAMPTON
184	HAMPTON FALLS
165	NORTH HAMPTON
45	PORTSMOUTH
70	RYE
51	SEABROOK
62	SOUTH HAMPTON
111	STRATHAM

1465 Desktop Wells Added

as of June 30, 2004



CONVENTIONAL INVENTORY	DESKTOP INVENTORY	TOTAL GEOREFERENCED	SEACOAST TOWN
14	0	14	EAST KINGSTON
129	60	189	EXETER
100	261	361	GREENLAND
19	133	152	HAMPTON
74	184	258	HAMPTON FALLS
66	0	66	KENSINGTON
6	0	6	NEWINGTON
30	165	195	NORTH HAMPTON
6	45	51	PORTSMOUTH
17	70	87	RYE
6	51	57	SEABROOK
16	62	78	SOUTH HAMPTON
111	111	222	STRATHAM
594	1142	1736	

Water Use

- Survey of Water Users Identified from Dunn and Bradstreet Database
  58 facilities contacted based on predicted water use calculated by USGS from database attributes:
  22 responded <2,000 gpd of which 5 are closed
  12 responded <10,000 gpd
  10 responded <20,000 gpd
  5 already registered
  4 new registrations
  3 returned as undeliverable; no viable address obtainable
  2 non-respondents; no response likely

- Municipal Questionnaire
  25 municipal water suppliers contacted requesting a list of customers that use more that 20,000 gallons of water per day and therefore qualify for registration

25 total responses, resulting in lists from 11 water suppliers identifying a total of 44 potentially qualifying facilities:
20 already registered
24 water using more than 20,000 gpd but not registered:
2 responded <20,000
2 of the identified users were on the Dunn and Bradstreet list
7 new registrations
15 non-respondents, follow-up ongoing

Surficial Geologic Mapping:

- Digitization and attribution of 14 surficial geologic quadrangle maps (12 full quadrangles and 2 partials) was completed, resulting in a seamless GIS data layer covering a significant portion of the study area. Mapping is currently underway in 2 quadrangles as part of a project funded by the STATEMAP cooperative geologic mapping program for 2003 and digitization is expected to be complete by late fall 2004. Additional funding was obtained through the 2004 STATEMAP program to map and digitize 1 full quadrangle and 2 partial quadrangles in the northernmost part of the study area along the Maine state boundary and to digitize an additional 2 quadrangles in the southwestern part of the study area during 2005.

- Metadata are almost complete for the resulting GIS data layers. Full public release and distribution of the datasets are expected during October 2004.

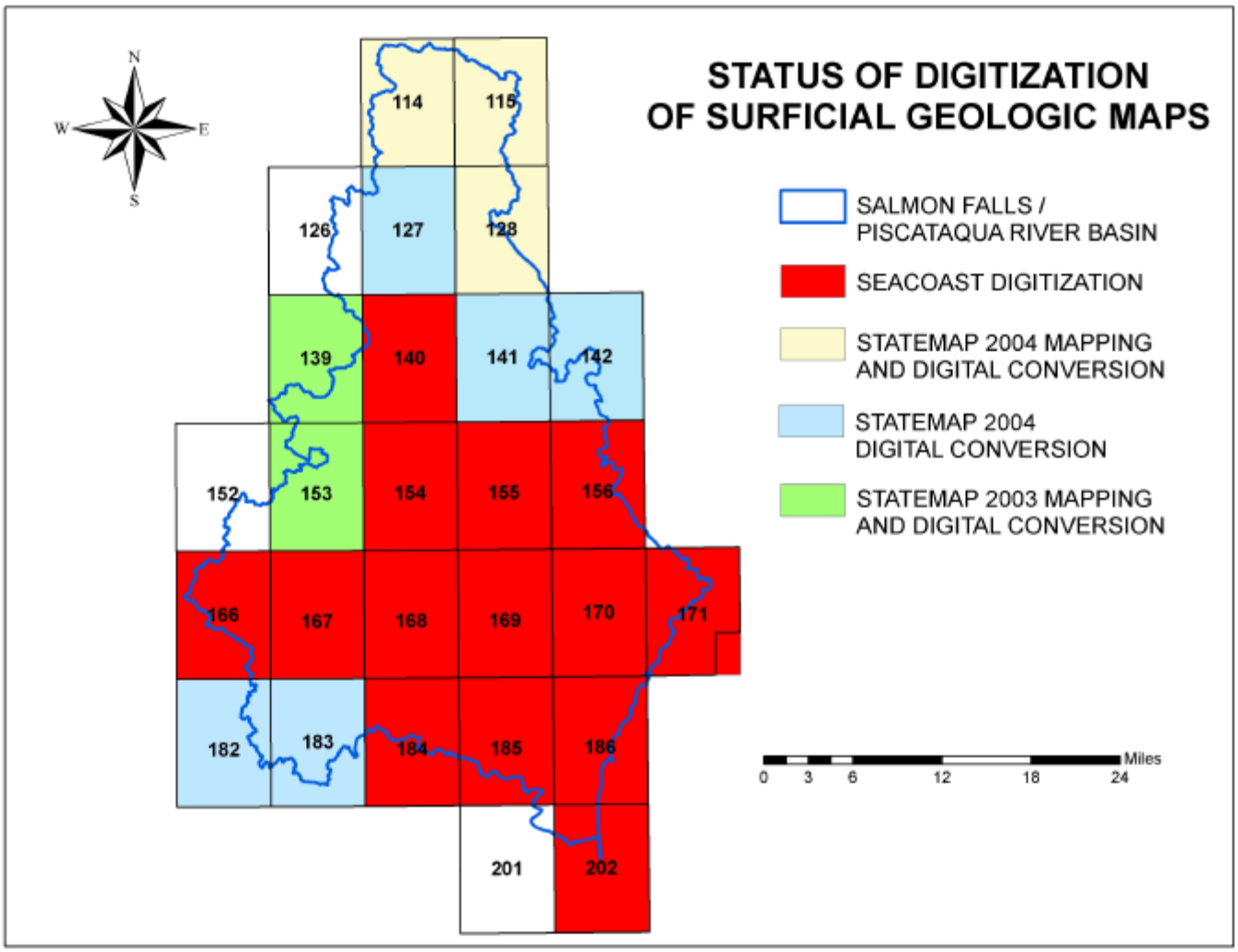
Groundwater Availability Estimation:

- Current references pertaining to concepts and specific approaches continue to be compiled for future review and evaluation.

- A copy of the report "A Method for Evaluating Ground-Water-Recharge Areas in New Jersey" was obtained.

- The possibility of applying the USGS Precipitation Runoff Modeling System (PRMS) is being explored based on article entitiled "Quantifying Ground Water Recharge at Multiple Scales Using PRMS and GIS" published in a recent volume of Groundwater (Cherkauer, 2004).

- Groundwater recharge estimates and lowflow streamflow statistics were calculated for each of the 12-hydrologic units in the study area using a GIS-based application developed for NHDES by the US Geological Survey. This software tool automates the solution of a series of multiple regression equations by deriving input values for the independent variables from digital coverages that describe the physical characteristics of a watershed.



Additional updates and information on subsequent phases of the project will be available on DES and USGS websites:

http://des.nh.gov/Coastal/Restoration/groundwater.htm

http://nh.water.usgs.gov/CurrentProjects/seacoast/index.htm