Chapter I: Water Resources

1. Purpose:

A comprehensive plan must assess a town's water resources. The availability of groundwater is crucial in determining where the majority of future development will occur.

Specifically, this chapter will:

a) describe the characteristics, uses, and quality of Gouldsboro's significant water resources;

b) predict and consider potential negative impacts to water quality caused by future growth and development, and

c) assess the effectiveness of existing measures to protect and preserve significant water resources.

2. Key Findings and Issues

Gouldsboro residents depend primarily upon bedrock wells for their drinking water, which normally provides adequate water for domestic use. There are no known gravel aquifers supporting Gouldsboro wells. Lack of information on groundwater resources, first mentioned in the 1993 plan and again in the 2005 plan, remains a major concern for Gouldsboro. Because there is no public water system, future development will require a determination for adequate ground water supply. While most water resources within 250-feet of the shore, rivers, certain streams and great ponds are protected by shoreland zoning, there is no zoning of inland areas. Currently there are mostly anecdotal reports of problems with wells in Gouldsboro, ranging from saltwater intrusion to problems with concentrations of iron, manganese or arsenic or problems with acidity. The prevalence of these problems is unknown. An extensive survey of existing wells would provide valuable information for planning future growth. Further in-depth studies are needed to ensure adequate ground water supplies for Gouldsboro.

The lack of town-wide zoning limits the ability of the Town to prevent certain uses that may harm water resources from locating in vulnerable areas. For example, there are no municipal ordinances prohibiting a commercial establishment with large areas of impervious surface from locating in a lake watershed. There are, however, state standards that regulate developments of one or more acres of impervious surface or five acres or more of disturbed area. The planning board drafted an amendment to the shoreland ordinance in early 2022, which requires property owners to obtain a permit for septic system repairs. This would make the Town aware of defective septic systems and ensure that corrective action is taken in a timely manner.

Gouldsboro's flood plain map was revised in September of 2020.

3. Key Findings & Issues from the 2005 Plan

The 2005 Plan noted that Gouldsboro took several measures between 1993 and 2003 to protect its water resources. This included enactment of a site plan review ordinance and revisions to the subdivision ordinance to include detailed phosphorus management standards. Both ordinances address storm-water run-off and nonpoint source pollution. These provisions are essentially those contained in the model 1996 subdivision ordinance standards developed by the Southern Maine Regional Planning Commission.

In 2005, there were no publicly owned water systems, but there were four public water systems as defined by the Maine Drinking Water Program, including wells serving Peninsula School, a campground, a commercial establishment and a major employer.

The Town identified existing overboard discharges as the only known point source of pollution to water resources, and was at the time collaborating with DEP to address these. The 2005 plan identified the town sand pile and former US Navy properties (and other handlers of hazardous waste), stormwater runoff and motor boats as possible contributors of nonpoint source pollution to water resources.

Additional threats and considerations identified in the 2005 plan included the existence of privately owned dams impacting water levels of public water resources, and the coordination with neighboring towns for protection of water resources that cross municipal boundaries. The Town also identified the need for a comprehensive study of its ground water resources, especially in more densely settled areas. Prioritizing future development in a manner that protects quality and quantity of groundwater, about which little was known, was considered a key water resource issue facing the town.

The Town identified the need to take steps to ensure it has an adequate supply of groundwater as the town continues to grow.

4. 2022 Public Opinion Survey Results

The town survey indicates that the responding residents hold protecting water resources as a high priority. 78.90% of the respondents felt there should be more water quality monitoring and that a plan to reduce/remediate pollution sources should be developed. 75.93% responded that protecting groundwater was very important. 74.27% ranked protecting rivers and streams as very important and 67.92% ranked

protecting wetlands as very important. Respondents were split almost evenly when asked about storm water management. 40.25% felt storm water management ranked as excellent or good whereas 39.41% felt it was fair to poor.

5. Surface Water Resources

Freshwater Resources:

There are five great ponds (naturally made fresh water ponds greater than 10 acres), which are entirely or partially located in Gouldsboro. The watershed of a pond is the land area that drains into that pond, and is an important concept to understand when protecting water quality. Many different levels of watersheds can be mapped, with smaller watersheds contained within. There are numerous small ponds, some of which are man-made. These small ponds are not subject to state laws such as the Natural Resources Protection Act. Gouldsboro shares a number of watersheds with adjoining towns (See Table H.1). This means that the protection of some ponds may be best addressed in cooperation with those communities.

Table I – X: Characteristics of Gouldsboro's Ponds

Characteristics of Gouldsboro's Great Ponds					
Name	**Acres (surface area)**	**Elevation**	**Depth**	**Access to pond**	**Other towns in watershed**
Forbes Pond	208	20 feet	7-11 feet	Off 195 by foot path	Gouldsboro
Jones Pond	451	52.5 feet	15-48 feet	Recreation Road public access	Gouldsboro, Sullivan, T7 SD
Lily Pond	19.5	102 feet	12-22 feet	South Gouldsboro / Shore Road	Gouldsboro
Lower West bay Pond	59	30 feet	Varies throughout .5-3.6 feet	Guzzle Road	Gouldsboro, T7 SD
West Bay Pond	314	31 feet	8 feet	Carry in Boat access	Gouldsboro, T7 SD

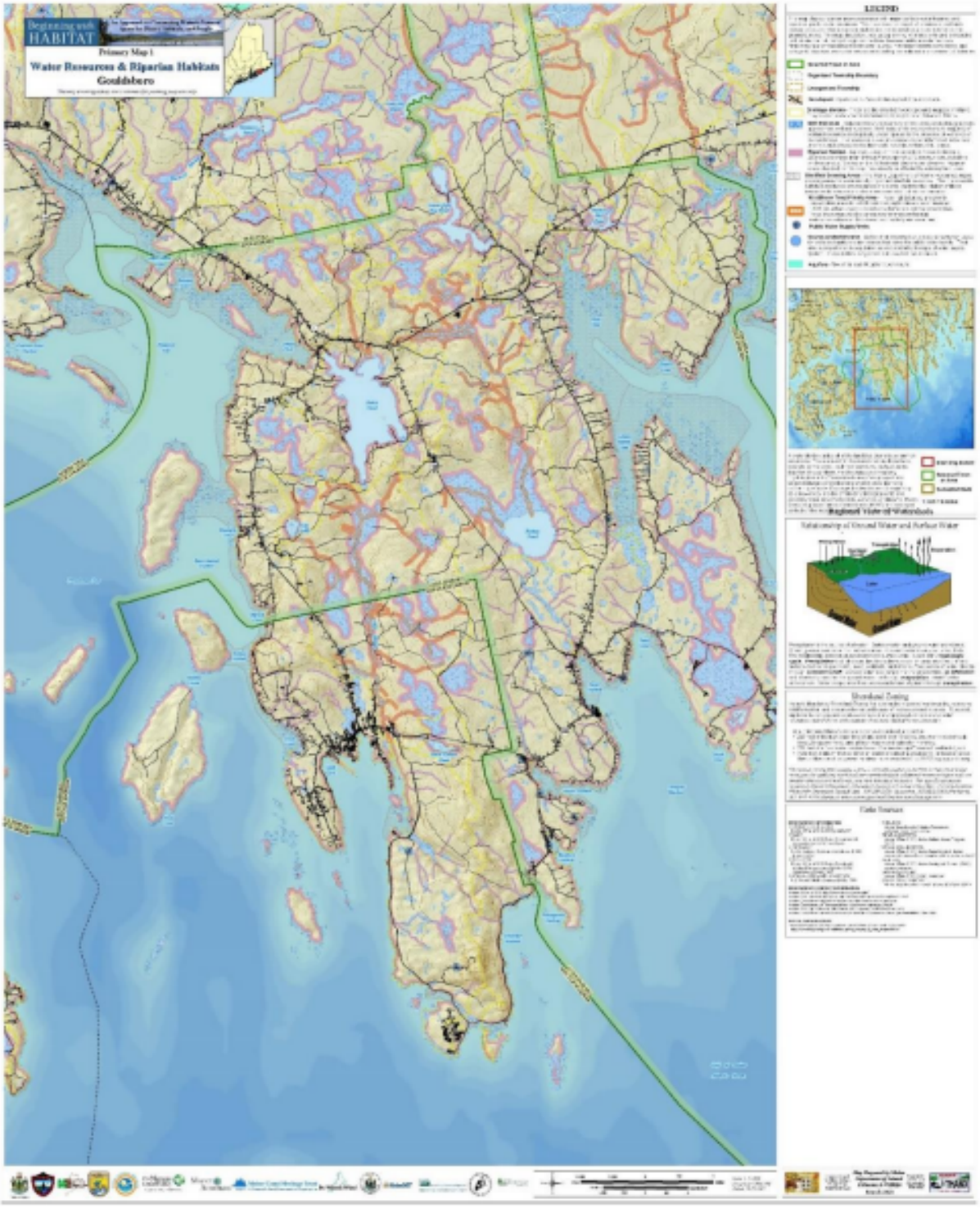
Sources: Maine.gov/ifw/docs/lake-survey-maps/hancock, Nature Conservancy, fishing app.gps

nautical charts.com, Maine Coast Heritage Trust

All of Gouldsboro's freshwater ponds have susceptibility to phosphorus loading and other contaminants have been identified by the Maine Department of Environmental Protection as an important factor in water-body quality. Phosphorus is a naturally occurring element that clings to soil particles and organic matter. Increased excessive amounts of phosphorus runoff into a lake will cause algae to become a nuisance and negatively affect cold-water fish. An abundance of algae turns the lake green and blocks sunlight to deeper waters. This process can destroy the water quality of the lake. The DEP has not identified any of Gouldsboro water sources as having a vulnerability to phosphorus levels.

DEP standards for the level of protection are advisory only but can be used as a planning guide for allocating or limiting development in the watershed. Many communities have taken measures to regulate phosphorus runoff resulting from residential development and related activities in their watersheds.

Map I-XX: Gouldsboro Surface Water



(source: https://www.maine.gov/ifw/fish-wildlife/wildlife/beginning with-habitat/maps/pdf/Gouldsboro/Gouldsboro%20Map%201.pdf

Map I-XX: Gouldsboro Streams, rivers, and creeks: Tucker Creek (A), Whitten Parritt Stream (B), Libby Brook (C), Nails Brook (D), Chicken Mill Stream (E), Dike Brook (F). (source: https://www.city data.com/city/Gouldsboro-Maine.html)

Marine Water Quality:

The Maine Department of Environmental Protection implements water quality programs under the Clean Water Act and state law. The Department is responsible for managing, protecting and enhancing the quality of Maine's water resources through voluntary, regulatory and educational programs. The Department collaborates with local, state and federal agencies to plan and implement strategies to protect Maine's water quality.

The DEP classifies all surface water in Maine, both fresh and saltwater. These classifications set the standards allowed for discharges of pollutants. The majority of waters in the state, including those adjacent to Gouldsboro, are classified "SB," which is the second highest classification and denotes that the water is swimmable and fishable. Per DEP standards, habitats in these waters "shall be characterized as unimpaired." No discharges that would cause closure of open shellfish areas are permitted. Dissolved oxygen contents are set at 85 percent. For more information on marine water quality, see Chapter H (Marine Resources)

Threats to Surface Water Resources:

The Town's ability to manage its groundwater resources is limited. Both the 1993 plan and the 2005 plan recommended a hydrological study of Gouldsboro's groundwater supply but recognized the expense of such a study. Commercial entities wishing to establish a presence in town may be required to undertake a hydrological study of the site prior to development per the town's site plan ordinance.

The Maine Tracking Network currently tracks the following measures associated with private well water: Well water use and testing behavior and water quality. Thousands of well water samples have been analyzed at the State of Maine Health and Environmental Testing Laboratory. Maine's Maximum Exposure Guidelines are as follows: Arsenic: 10 ug/L (micrograms per liter), Chloride: 250 mg/L (milligrams per liter), Fluoride: 2 mg/L, Manganese: 0.3 mg/L, Nitrate: 10 mg/L, Nitrite: 1 mg/L, Uranium: 30 ug/L.

There are two types of pollution that threaten surface water: point and nonpoint. Point pollution is attributable to a specific source such as a pipe discharging into a stream. Nonpoint pollution comes from a general source such as storm water runoff that carries oil spilled on a road into a stream. Currently there are no known specific point sources in Gouldsboro.

Access to surface water resources:

Upper West Bay Pond can be accessed by a paddlers trail starting at the Day Ridges Preserve, which was developed and managed by Frenchman Bay Conservancy. In 2016, Maine Coast Heritage Trust (MCHT) acquired the first of four parcels that comprise the Forbes Preserve. Funding came from a variety of sources, including the US Fish and Wildlife Service's North American Wetland Conservation Act (NAWCA) program. The MCHT" acquisition of the Forbes Pond Preserve opened an additional opportunity for access to this freshwater pond. The addition of the preserve significantly added to the Town of Gouldsboro's freshwater resources. Jones Pond is located on Recreation Road and is accessible to the public for boat launching, swimming and as a recreation picnic area is managed by the town.

6. Groundwater Resources:

There are three types of wells commonly used in Maine: drilled bedrock wells, drilled overburden wells, and dug wells/springs. Of the three types, drilled bedrock wells are by far the most common source of drinking water for Maine homes.

Gouldsboro residents and businesses depend on individual wells for their water supply. Sand and gravel aquifers yield large quantities of water to wells, but Gouldsboro's geology includes no sand and gravel aquifers. Rather, most wells in Gouldsboro are drilled in bedrock. Bedrock wells generally yield about 10 to 50 gallons per minute (gpm). Normally, a well yielding about 1-5 gpm is considered sufficient for domestic use.

Four wells in town are listed as public water supply wells by the Maine Drinking Water

Program. These wells serve the school, restaurants, and a campground. There are no major current problems in Gouldsboro with ground water supply. However, ground water resources are notoriously unpredictable and new development might create problems for existing wells.

Currently, the state of Maine has no records of contaminants exceeding the regulated limits for these wells.

Table I –XX: Wells in Gouldsboro Listed in the Maine Drinking Water Program

Maine Public Water Systems By County — 9/1/2023

HANCOCK PUBLIC WATER SYSTEM NAME	PWSID	OPER-ATING CTGRY	WATER SYSTEM TYPE	SOURCE	SOURCE TYPE
GOULDSBORO					
BUNKERS SEAFOOD AND SPIRITS	ME0010426	VSWS	NC		
				100' BR WELL 6-15-1989 @7 GPM	WL
THE PICKLED WRINKLE	ME0022922	VSWS	NC		
				300' BEDROCK WELL 1993 @ 38 GPM	WL
RSU 24 PENINSULA ELEMENTARY SCHOOL	ME0092395	VSWS	NTNC		
				200' BEDROCK WELL 2010 @ 100 GPM	WL
WEST BAY ACADIA RV CAMPGROUND	ME0092754		NC		
				400' BR WELL 2-17-2020 @ 20GPM	WL

Source: maine.gov/dhhs/mecdc/environmental-health/dwp/imt/documents/PWSbyCounty.pdf

The DEP has rated Gouldsboro's groundwater as GW-A. This is the highest DEP water-quality classification, and it applies to all groundwater in the state unless specifically noted otherwise. DEP standards mandate that these waters be of such quality that they can be used for public water supplies. They shall, per DEP standards, be free of radioactive matter or any matter that affects their taste or odor.

Threats to Groundwater:

Given the low incidence of nonpoint pollution in Gouldsboro and the overall low density of the population, the groundwater supply is generally considered safe. Currently DowneastMaine has experienced several periods of drought since the last comprehensive plan update. If drought conditions return, ground-water levels could be impacted. Lower well water levels could potentially lead to saltwater infiltration as a significant number of Gouldsboro residents live fairly close to the shore lines.

As of August 2023, the state is in a non-drought condition.

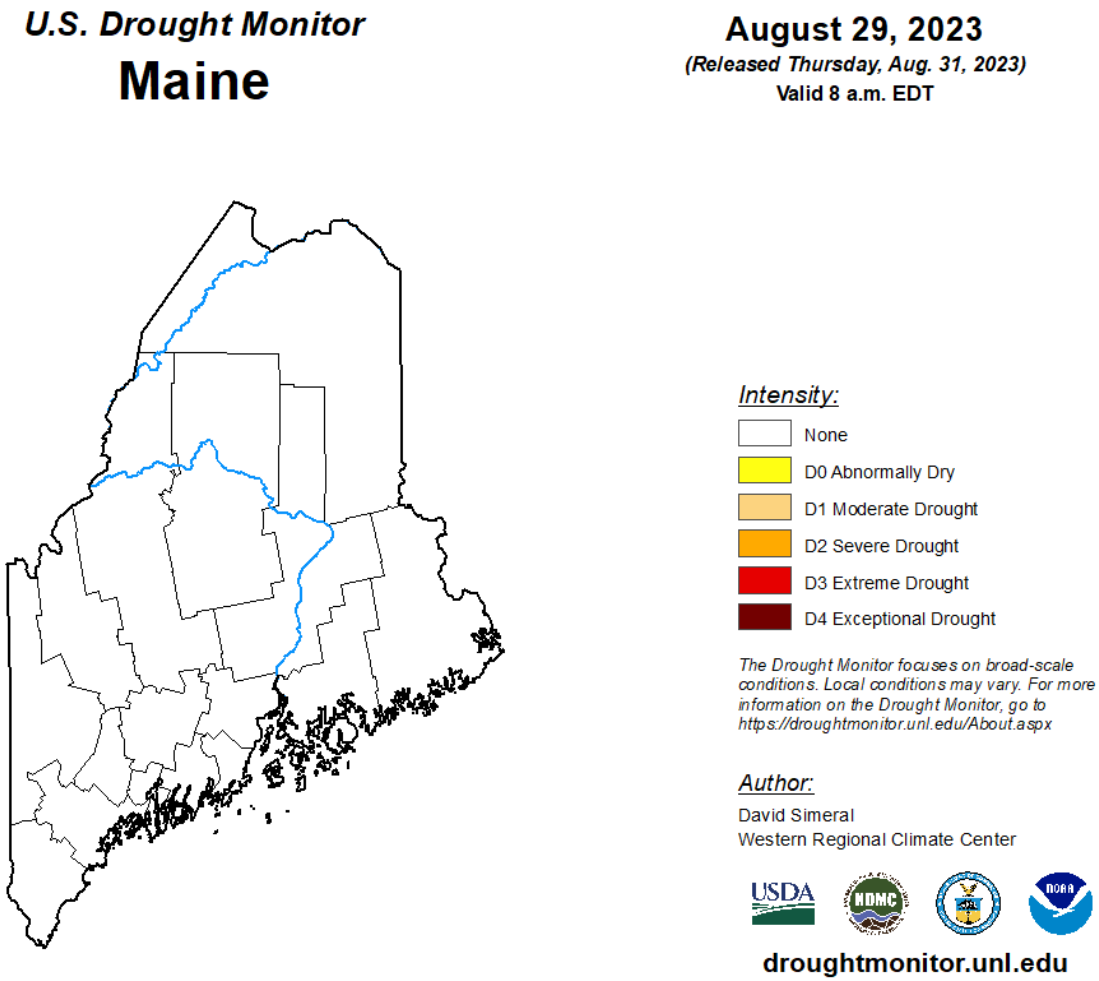


Table I-X, indicates the drought conditions since 2000. Droughts are still considered one of the biggest potential impacts on Gouldsboro's groundwater supply.

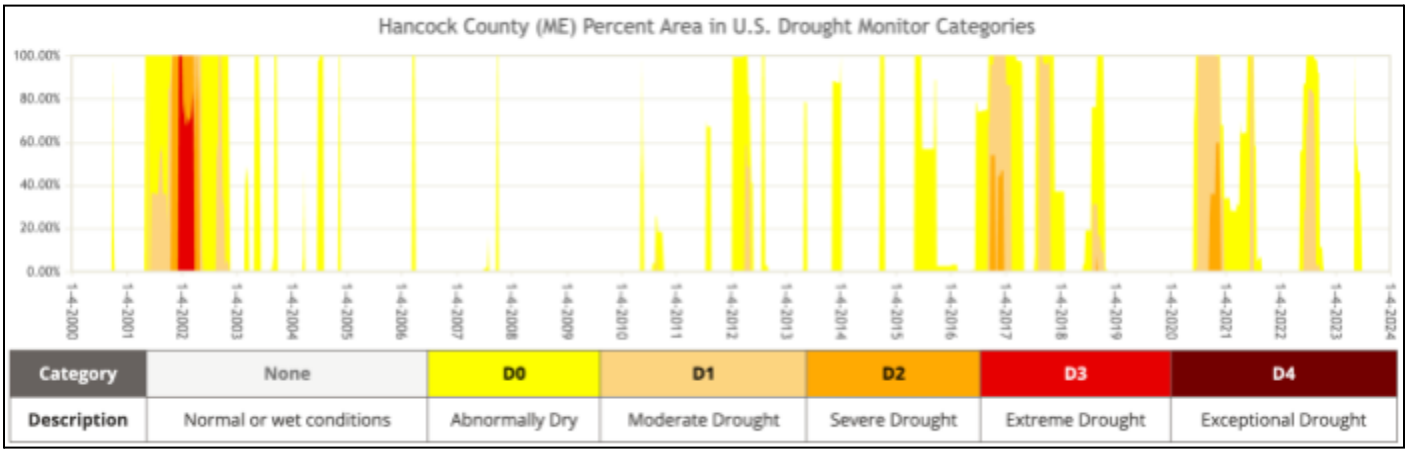


Table I-X, Maine Drought Monitor (source: The U.S. Drought Monitor, a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration.) In addition to the threat of drought, there are other potential well contaminants of concern to Gouldsboro residents. The following chart provides county wide data.

Percent of Wells that Exceed State Guidelines for Selected Analytes						
Location	Arsenic %	Fluoride %	Manganese %	Nitrate %	Nitrite %	Uranium %
Hancock	21.4	6.5	7.6	0.3	0	7.9

Test Results for Radon in Air by County, Maine							
Oro residents." Location	Housing Status	Number of Households Tested	Percent of Households		Median	95th Percentile	Maximum
			≥ 2 pCi/L	≥ 4 pCi/L	pCi/L	pCi/L	pCi/L
Hancock County	Non Rental	1,624	62.7	42.1	3.1	24.8	570
	Rental	849	45.3	22.3	1.7	7.6	22

As there is no mandatory well testing within Hancock County, individual well owners should have their well evaluated for microorganisms, such as bacteria, viruses or parasites that may cause disease, and from chemicals at levels that may be a risk to health. The State of Maine recommends that well water should be tested once a year for bacteria and nitrates and every five years for arsenic, fluoride, uranium, radon, lead, and manganese. Per- and polyfluoroalkyl substances (known as PFAS) are also of potential future concern. Currently there is no indication of

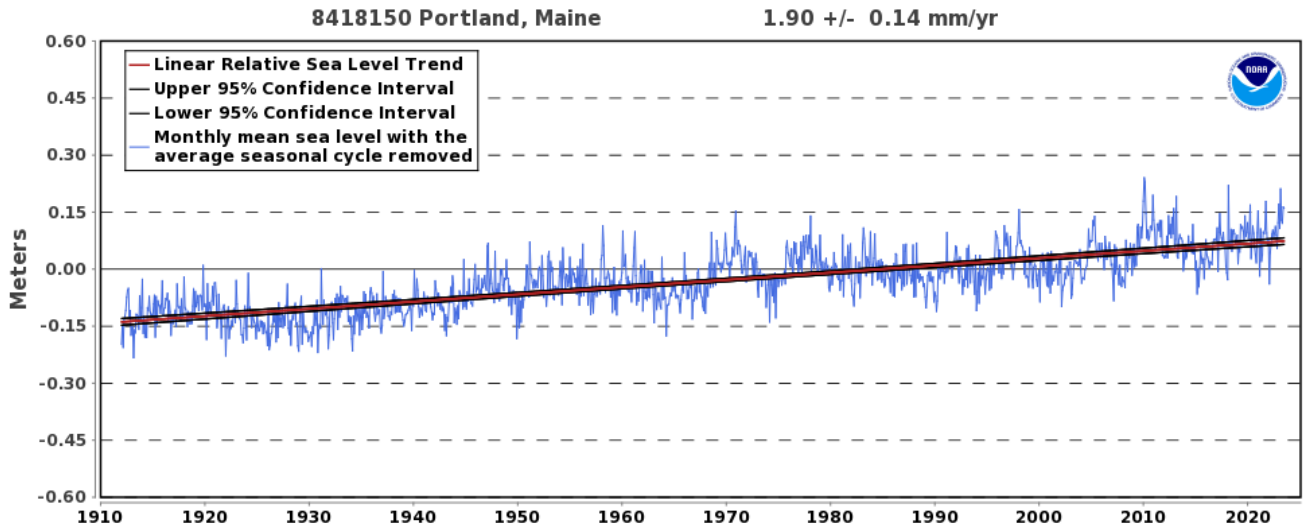
contamination; however, there also has been very little testing for it within the town.

7. Climate Change Considerations:

Sea levels rising is well-documented along the length of Maine's coast. Figure xx shows the historical tide data from Portland with projected future tidal heights. Gouldsboro will also be affected by sea level rises. This rise in sea level could lead to more significant storm surges. As a significant percentage of Gouldsboro's economic entities rely on ocean commerce, it is anticipated that an increase in storm strength and scope could have a significant impact on the town. Also, storm surges could impact well heads that are located close to the coast.

Despite overall increases in precipitation, snowfall in Maine has decreased by about 15% since the late 1800s. (see Figure I-xx.) Changes in the timing of precipitation – wetter spring and fall with longer dry spells during summer months – coupled with decreases in snow fall and "groundwater recharge during extreme precipitation events, referenced above, may lead to decreases in groundwater recharge necessary to maintain underground aquifer sources and the wells dependent on them. Shallow wells will be the most influenced. Adaptation and mitigation strategies to address the effects of climate change will need to include both supply-side and demand-side strategies. Policy development will need to incorporate a variety of stakeholders as water is critical to many sectors – energy production, health, food, and ecosystem integrity." (source: Municipal Climate Adaptation Guidance Series: Drinking Water 2017.)

Figure I-xx



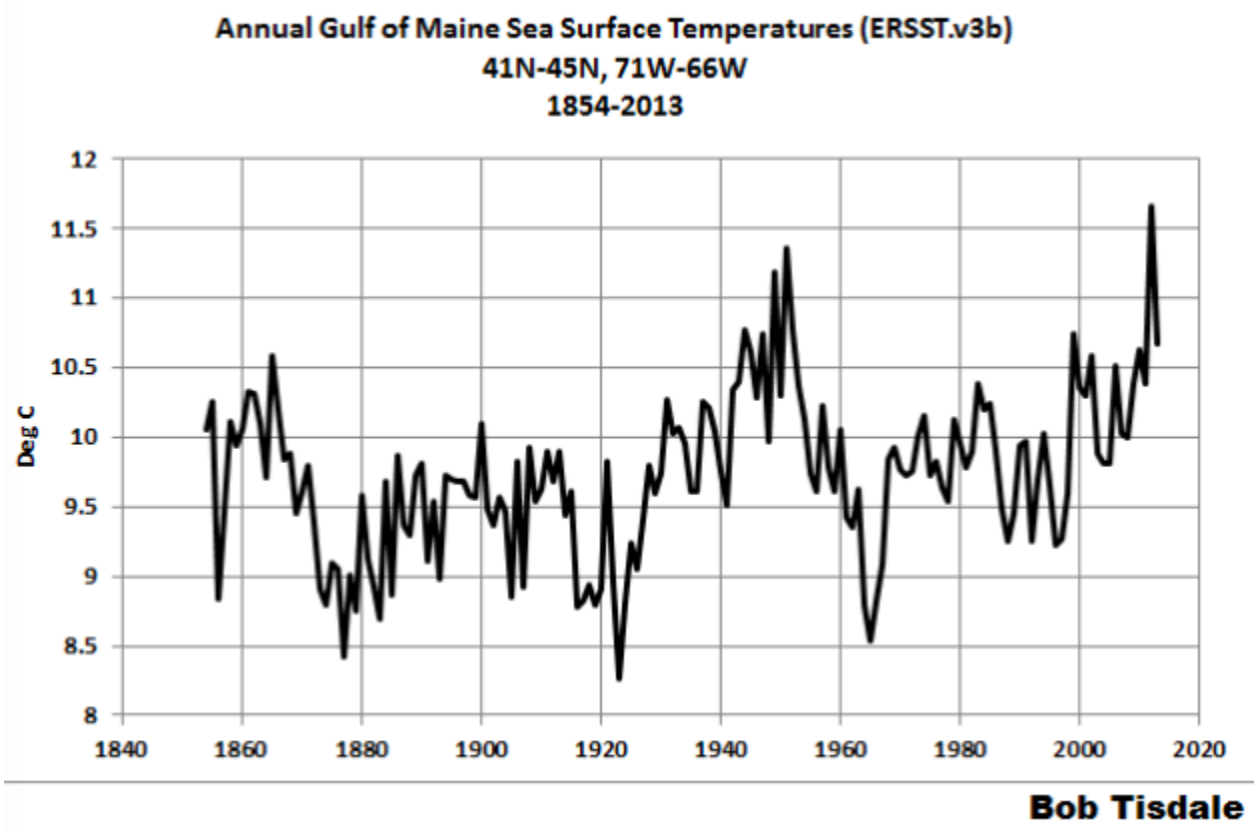


Figure I-xx

7. Future Adequacy of Gouldsboro's Water Resources

If the moderate rate of growth projected for Gouldsboro proves to be correct, current drinking water supplies should be adequate for the near future. The only potential problem would be threats to individual wells from contamination or from the potential addition of high usage industrial water users.

8. Adequacy of Existing Measures to Preserve Significant Water Resources

Gouldsboro's current measures to protect water resources consist of the Shoreland, Site Plan, and Subdivision ordinances. The current site plan review ordinance has standards to protect against water pollution, assure adequate sewage disposal, and storm water drainage for future projects. If the town decides to enact a town-wide land use zoning ordinance, it could also help the development of additional measures to protect water quality. These might include standards for maximum impervious surface, drainage provisions, well discharge limitations as per allowed by the state and storage requirements for the storage of potential pollution-causing materials. Non-government organizations currently provide advice and assistance that is welcomed as an essential means of preserving the quality of significant water resources in Gouldsboro. Gouldsboro also actively interacts with neighboring municipalities, county and state planning entities, as well as community non-government organizations to ensure a holistic approach is taken when planning for future water use requirements.

9. Regional Issues

There are no immediate regional groundwater resource issues facing Gouldsboro. The town does not share any sand and gravel aquifers with surrounding towns. Given the moderate rate of growth projected for the town, there is no foreseeable likelihood of the town needing to develop a municipal water system. There would be a benefit to a well-organized regional approach to well water testing.

Are there opportunities to partner with local or regional advocacy groups that promote water resource protection? - mentioned as a strategy, any further discussion?

10. Goals & Objectives

GOAL: Protect Gouldsboro's vital water resources for long-term health.			
Objective	**Strategy**	**Responsible Party(ies)**	**Timeline**
Pollution Source Management	Ensure town regulations include adequate provisions to manage point and nonpoint pollution	Select Board, Planning Board, Code Enforcement Officer (CEO)	Immediate, ongoing
Groundwater protection	Ensure compliance with local and state regulations regarding groundwater protection	CEO	Immediate, ongoing
Protect habitat in sensitive riparian areas delineated by the DEP.	Work with the various land trusts, property owners, and Acadia National Park to maintain and, if necessary, create a resource protection buffer around habitats delineated by DEP	Select Board and Planning Board in conjunction with Hancock County Planning Commission.	5 years
Educate all residents on well water monitoring.	Provide all residents with information on how, why, and when to monitor their wells with information provided by the Maine Drinking Water Program	CEO	Immediate and ongoing

	publication"Protecting your wellhead: Do's and Don'ts).		
Work with regional and state entities to ensure water quality monitoring information is made available to all residents.	Request state resources be utilized in Gouldsboro and that all testing information if readily available to the town and its residents	Select Board and CEO	Immediate and ongoing
Establish a plan to reduce or remediate sources of pollution	Request state resources be utilized in Gouldsboro that would help implement remediation and prevention techniques to prevent the spread of pollution and contaminants	Select Board and Planning Board in conjunction with Hancock County Planning Commission.	Initial plan within in 3 years and then reviewed every 5 years
Conduct groundwater study for sustainability as suggested in 2005 plan	Hold community and board discussions for the best way for town to afford such a study	Select Board	Within 1 year