

### **Section III ~ Environmental Resource Inventory**

This ERI should be interpreted and used in the context of the State regulations summarized above. The data and figures included herein can be used by the Borough to facilitate the implementation of various land use, land preservation, resource protection and impact mitigation measures needed to meet the requirements of these regulations, as well as to satisfy Borough planning and environmental ordinances and land development/land use design standards.

The Borough's ERI is made up of individual sections, which includes a figure displaying the location(s) and extent of the resource discussed in an accompanying text. The figures and information are based upon the most current available geographic information systems (GIS) databases, many of which have been obtained from State and County agencies. In addition, a series of corresponding appendices complements each section and figure.

In an effort to provide the Borough with a useful and "user-friendly" ERI, the electronic version of this document also includes hyperlinks that allow instant access to associated information both within the ERI and its appendices and on the Internet (including County and State websites). Together, the figures, text, appendices and weblinks provide a rich, comprehensive and site-specific description of the Borough's resources in the context of the County and State physical and regulatory landscapes.

### 3.1 Region and Demographics

The Borough of Franklin Lakes was incorporated in 1922 and just celebrated their 85th Anniversary. Located in the northwestern corner of Bergen County, the Borough encompasses approximately 10 square miles with an estimated population of 11,340 residents in 2006 (Table 1). The community has experienced significant changes over the years. The US Census data identified that the Borough has experienced intensive development pressures and population growth. From 1970 to 1980 the population grew by 16.1% and by 12.6% in 1990 with the expansion of Interstate 287. The population grew by 5.6% from 1990 to 2000, and is estimated to have grown by 8.8% from 2000 to 2006. With limited available land, accommodating future growth, while preserving resources, open space and community character becomes increasingly more important for each community. [Figure 1](#)

Much of the Borough is built out, and limited forest, wetlands and farms remain in the community. Approximately 60% of the community relies on individual septic systems and private wells, and the zoning allows one-acre lots. Given the local development pressures, it is critical for Borough to ensure that the environmental and cultural resources are fully documented; that GIS mapping accurately reflects the conditions and features within the community; and that planning objectives for preservation or growth are well supported by the most up to date information.

Water resources are important features within the community of the Borough. In addition to Franklin Lake and the Haledon Reservoir, Shadow Lake and Parsons Pond drain to the Hohokus Brook, and Bakers Pond drains to the Ramapo River. These lakes, ponds, streams and wetlands have been impacted by development and runoff, and impairments from sediment loading, excessive nutrients and algal blooms have been observed. Protecting the water resources of Franklin Lakes is an important community goal. The Borough recently acquired the 127 acre Haledon Reservoir for recreational purposes; however, the lakes and streams in this community are not afforded a 300 foot riparian buffer in order to protect the integrity of the water resource.

#### **History of The Borough of Franklin Lakes**

The following information on the history of the Borough was previously summarized in the 2008 Borough Community Forest Plan, and has been incorporated herein.

The Minsi tribe of the independent Lenni Lenapi nation originally inhabited this region. They camped in Franklin Cove, which is a natural rock formation that overlooks the lake the Minsi called Crystal Pool This Pool would later be known as Franklin Lake. The original European inhabitants of the area were Dutch who purchased 5500 acres of land from local Indians in 1694. Farms were created and various mills were established along local streams. The Borough, one of the oldest in Bergen County, was established in 1771. It was named for the last Royal Governor of the Province of New Jersey William Franklin son of Benjamin Franklin.

Franklin Lakes originally included parts of HoHoKus, Midland Park, Wortendyke, Wyckoff, Ramsey and Oakland. During most of the 1800's the area included farms, dairies, gristmills, sawmills, blacksmiths and tradesmen. Around 1860 the population began to grow and a small but industrious town center evolved. In 1922 the Borough of Franklin Lakes broke away from Franklin Township to become a separate municipality. Development pressures increased after World War II resulting in the subdivision of farmland for housing, such as the Urban Farms residential development.

### **Demographics**

According to the US Census and the Bergen County Department of Planning the population of the Borough was recorded as 10,422 people in 2000. In 2007, the Borough had an estimated population of 11,576 people, within 3,322 households. From 1990 to 2000 the Borough population grew by 5.6% and the housing stock grew by 8.8%, while the County increased by 7.1%. With an area of 10 square miles, this represents a population density of 1,102.5/square mile in 2007 (Table 1).

The Borough saw tremendous growth during the 1950s-1970 with recorded population increases of 60-128%. With much of the Borough already developed, this growth stabilized with population increases ranging from 16-11% from the 1980s to 2007. The proposed population growth in the Borough likely reflects the increase in developmental pressure spurred by suburban growth and accessibility to major transit and transportation routes (Routes 208 and 287).

Bergen County population growth grew by 44% from 1950-1960, and by 15% from 1960-1970. The county experienced slightly declining populations from 1970-1990. However, growth and population increases grew marginally by 7.1% in 2000 to include 844,118 people living in 330,817 households, and an employment increase of 13%. Bergen County is the most populous county within New Jersey. The US Census estimates the population will grow by 2.3% to 904,037 in 2006. Bergen County is part of the New York Metropolitan area and ranks 18th among the highest-income counties in the United States in 2006 in terms of per-capita income. (Bergen County, 2007)  
<http://www.co.bergen.nj.us/> and <http://www.co.bergen.nj.us/planning/data/census.asp>

<b>Table 1: The Borough of Franklin Lakes Demographics</b>						
<b>Municipality</b>	<b>1960</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2007 Estimation</b>
<b>Borough of Franklin Lakes</b>	3316	7550	8769	9873	10,422	11,576
<b>% Population Change</b>	65%	128%	16.1%	12.6%	5.6%	11.1%
<b>Bergen County</b>	<b>780,255</b>	<b>897,148</b>	<b>845,285</b>	<b>825,380</b>	<b>884,118</b>	<b>904,037</b>
<b>% Population Change</b>	44.7%	15%	-5.8%	-2.4%	7.1%	2.3%
US Census Data, 1960-2000.						

### 3.2 2002 False Color Infrared Aerial Photograph

The false color infrared aerial photography used in the preparation of this inventory was obtained from NJDEP GIS data ([Figure 2A](#)). In 2002, NJDEP commissioned a flyover of the entire state to account for recent development changes and improve digital reproduction resolution. The aerial photography provides an overview of the Borough's land uses, locations of surface waters, developmental features, agricultural sites, and main travel corridors, as they existed at the time of the flyover. This 2002 Aerial photographic map also serves as the base coverage, which the NJDEP utilized to develop various NJDEP GIS datalayers such as topography, soils, and Land Use/Land Cover (LU/LC), wildlife habitat mapping, and other resource maps. Field verification is integral for site specific projects due to certain limitations in scale and continual change in land use. An updated 2007 aerial map is also provided ([Figure 2B](#)); however, the accompanying updated NJDEP datalayers are not yet available. This map can identify the development which has occurred in the Borough from 2002-2007.

The value of aerial photographs is the ability to easily identify developed lands, natural areas, and contiguous habitat areas. The false color infrared aerial photography helps to distinguish agricultural lands from lawns, forests, and parks because different vegetation types emit different infrared wavelengths. For this reason, lawns and actively cultivated fields appear as dark red areas while forested and barren areas are more subdued. As the vigor and density of vegetation decreases, the tones may change to light reds and pinks. If plant density becomes low enough the faint reds may be overcome by the tones of the soils on which the plants are growing. Dead vegetation, wheat stubble as an example, will often be shades of greens or tans. The ground areas in this case will appear in shades of white, blue, or green depending on the kind of soil and its moisture content. Bare soils will appear as shades of white, blue, or green in most agricultural regions. In general, the more moist the soil the darker the shade of that particular soil color. Composition of the soil will affect the color tones shown on the photographs. Dry sand will appear white and, with more moisture, may be very light gray or possibly light tan. Clayey soils will generally be darker in color than sands and tend toward tans and blue green. Again, wetter clays will be darker shades of the same tones. Soils high in organic matter, like silts and loams will be even darker in color, and usually in shades of blues and greens.

Aerial photographs also serve as historical records that can be used comparatively with older photos to identify changes in land use, infrastructure, and development over time. Asphalt roads will be dark blue or black, gravel or dirt roads will show as lighter colors, depending on the soil materials involved in their composition, and concrete roads will appear light in tone, assuming clean concrete.

Water will appear as shades of blue, varying from nearly black to very pale blue. Clear, clean water will appear nearly black. As the amount of sediment increases, the color becomes increasingly lighter blue. Very shallow water will often appear as the material present in the bottom of the stream. For example, a very shallow stream with a sandy bottom will appear white due to the high level of reflection of the sand.

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### 3.3 Climate And Climate Change In New Jersey

Climate has become an important component of an Environmental Resources Inventory, because temperature and precipitation ranges affects all living organisms, as well as vegetative growth and habitat composition. The New Jersey State Climatologist, Dr. David A. Robinson, Rutgers University, explained in a report to the NJDEP in 2005 that there is growing evidence that our global climate is changing as a result of human activities, and these changes may impact local and regional ecosystems and society. Dr. Robinson explains that in New Jersey, the most densely populated state of our nation, changes in our State's climate are likely to impact natural flora and fauna, human health and safety, agricultural productivity, fresh-water resources, tourism, transportation, and business and commerce. The NJ State Climatologist explained that, "it is imperative that we understand the nature of the climate of New Jersey in order to recognize the significance of its possible ongoing or future behavior."

New Jersey's climate is considered "continental" due to the significant difference in seasonal temperatures and fluctuation in daily temperatures. The dominant feature of the atmospheric circulation over North America, including New Jersey, is the "prevailing westerly winds" with undulating flow from west to east, which exert a major influence on the weather throughout the State. Rutgers University conducted a study in 2003 to evaluate regional climatic variables and trends in New Jersey over the past century. This was accomplished by identifying five stations across the State with lengthy and consistent records of temperature and precipitation utilizing data from nineteen (19) National Weather Service Stations in New Jersey. Station observations began as long ago as 1893 at some stations, and all sites extend back to at least 1948. Subsequently the Office of the NJ State Climatologist (ONJSC) was funded to continue developing and updating the New Jersey Climate Report Card. Some of the findings from this study are highlighted below.

[http://climate.rutgers.edu/stateclim\\_v1/climreportcard/climate\\_report\\_card.html](http://climate.rutgers.edu/stateclim_v1/climreportcard/climate_report_card.html)

The mountains in the Highlands play a role in defining the climate of the Northern Zone different from the rest of the state. For instance, following a cold frontal passage, air forced to rise over the mountains, generally produces clouds and precipitation. Thunderstorms spawned in Pennsylvania and New York State travel to Northern New Jersey, where they often reach maximum development in the evening. This region has about twice as many thunderstorms as the coastal zone, where the nearby ocean helps stabilize the atmosphere. [http://climate.rutgers.edu/stateclim\\_v1/njclimoverview.html](http://climate.rutgers.edu/stateclim_v1/njclimoverview.html)

- The Northern Climate Zone usually has the shortest growing season, about 155 days, with the frost season starting around October 7 till May 4<sup>th</sup>.
- Average annual precipitation ranges from about 40 inches along the southeast coast to 51 inches in north-central parts of the state. Many areas average between 43 and 47 inches.
- Average number of freeze free days in the northern Highlands is 163, 179 in the central and southern interior, and 217 along the seacoast.

- Most areas receive 25 to 30 thunderstorms per year, with fewer storms near the coast than farther inland. Approximately five tornadoes occur each year, and in general, they tend to be weak.
- Measurable precipitation falls on approximately 120 days. Autumn months are usually the driest with an average of eight days with measurable precipitation. Other seasons average between 9 and 12 days per month with measurable precipitation.
- The Northern Zone normally exhibits a colder temperature regime than other climate regions of the State. This difference is most dramatic in winter when average temperatures in the Northern Zone can be more than ten degrees Fahrenheit cooler than in the Coastal Zone. Annual snowfall averages 40 to 50 inches in the northern zone as compared with an average of 10-15 inches in the extreme south. Snow may fall from about October 15 to April 30 in the Highlands and from about November 15 to April 15 in southern counties.

The following graphs from the *2007-2008 NJ Climate Report Card* depicts how precipitation and temperature may have changed against the thirty year monthly averages. The first graph explains that in 2007, the months of June, July and August experienced relatively average amount of precipitation. However, the months of April, October, December, and February 2008 recorded approximately 2 inches of precipitation greater than the 30 year monthly average. In addition, the months of May, September, November and January 2008 were 1-3 inches drier than normal.

[http://climate.rutgers.edu/stateclim\\_v1/njwaterwatch2008.htm](http://climate.rutgers.edu/stateclim_v1/njwaterwatch2008.htm)

**The 2007-2008 timeframe also set three precipitation records:**

- April 2007      The wettest April in one hundred years (5 inches over the average)
- Sept 2007      The 3<sup>rd</sup> driest September (3 inches less than average)
- February 2008    The 9<sup>th</sup> wettest February (2 inches over the average)

**The 2007-2008 timeframe set three temperature records:**

The 2007-2008 temperature graph indicates that over nine of the twelve months (75%), New Jersey experienced above average temperatures.

- Sept-Nov 2007    The third warmest autumn on record
- October 2007    The warmest October recorded in one hundred years (8 degrees above normal)
- September 2007    The 8<sup>th</sup> warmest September (3 degrees above normal)

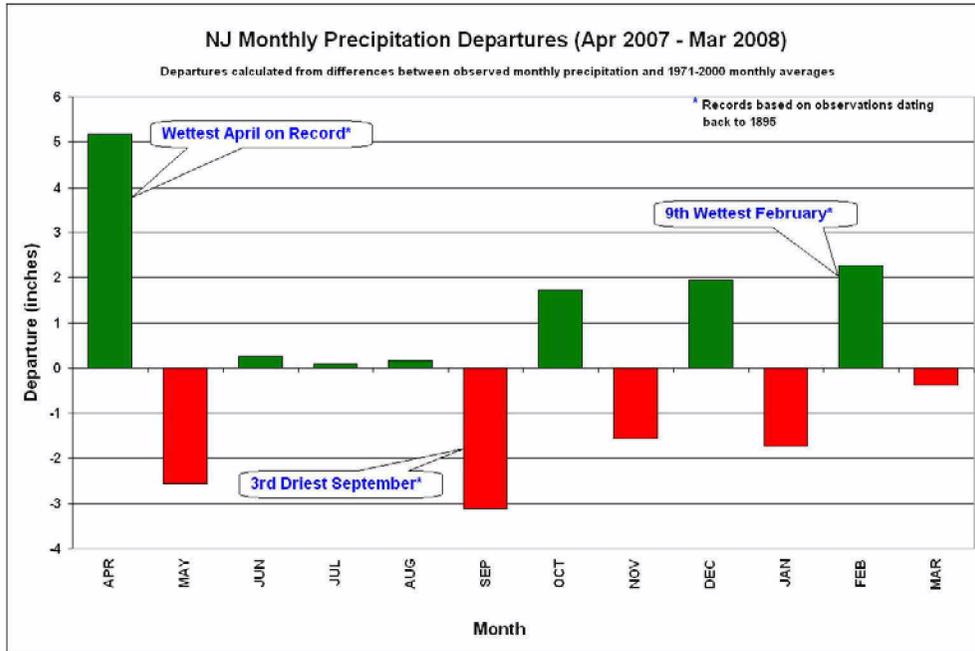


Figure 3A: NJ Monthly Precipitation Departures Spring 2007-2008

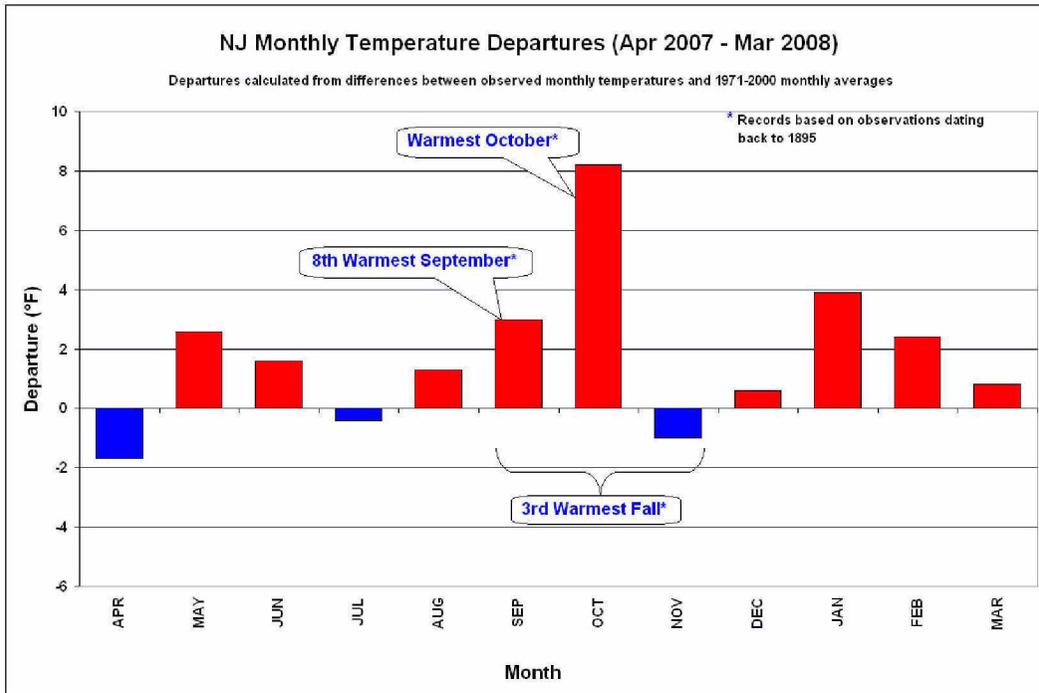


Figure 3B: NJ Monthly Temperature Departures Spring 2007-2008

## **Green House Gas Emissions and Climate Change**

The NJDEP Office of Science and Technology published a report on greenhouse gas emissions in January 2008, and highlights of this report are summarized herein. Greenhouse Gas (GHG) is an atmospheric gas that slows the rate at which heat radiates into space, thus having a warming effect on the atmosphere. GHGs include water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and other halogenated gases. The NJDEP reports that excessive CO<sub>2</sub> emissions have caused an imbalance in the planet's natural ability to absorb or use CO<sub>2</sub>, resulting in steadily increasing CO<sub>2</sub> concentrations. Global increases in CO<sub>2</sub> concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. Approximately 90% of New Jersey's GHG emissions are produced by the burning of fossil fuels, mainly natural gas, gasoline, diesel fuel/heating oil, and other petroleum-derived products.

The NJDEP reports that virtually all global climate models predict that global temperature will increase as concentrations of greenhouse gases emitted due to human activity build in the atmosphere. As a result of this planetary warming trend, it is also predicted that sea levels will rise. The NJDEP reports that there is good evidence that the earth's surface has warmed by over 0.7degrees C (1.3 degrees F) during the past century, especially during the last 60 years. Increasing temperatures have led to a reduction in the mass of the world's alpine glaciers, an increase in permafrost thawing at high latitudes and altitudes, and a reduction in the extent and thickness of Arctic sea-ice. Continued GHG emissions at or above current rates are expected to cause further atmospheric warming and induce many changes in the global climate system during the 21st century.

In New Jersey, long-term data document a significant increase in average temperature, and a significant rise in sea level that is consistent with observed and predicted global trends. The Office of the New Jersey State Climatologist has gathered statewide temperature records going back to 1895, and the NJDEP reports that a statistically significant rise in average statewide temperature has occurred over the last 110 years.

Details of these NJDEP reports are provided in Appendix D and can be viewed at <http://www.nj.gov/dep/dsr/trends2005/pdfs/ghg.pdf>

### **Impacts from Rising Temperatures**

The NJDEP referenced a recent climate modeling report for the Northeast states by the Union of Concerned Scientists, which concluded that the Northeast is especially vulnerable to the impacts of global warming, and New Jersey's ecology, economy, and public health may be impacted.

- The report stated that, regardless of what is done now to reduce GHG emissions, average temperatures across the U.S. Northeast will rise 2.5 to 4 degrees Fahrenheit

(approximately 1 to 2 degrees Celsius) in winter and more than 1.5 degrees Celsius in summer above historic levels over the next several decades.

- The report also stated that unless GHG emissions are significantly reduced average temperatures across the Northeast are predicted to rise and cities (such as Trenton) could experience more than 20 days per summer with temperatures above 100° F. Human health impacts are likely to include increased heat stress, especially for vulnerable urban populations such as the elderly and urban poor.
- Rising temperatures will increase ground-level ozone; the number of days failing to meet federal air-quality standards is projected to quadruple (if local vehicle and industrial emissions of ozone-forming pollutants are not reduced). High temperatures are expected to accelerate the secondary formation of fine particles, which also have negative health impacts, particularly children and the elderly, and can induce asthma related conditions.
- Warmer temperatures, particularly in the winter season, could facilitate the northern spread of insects carrying diseases.
- New Jersey is especially vulnerable to sea-level rise due to geologic subsidence, the topography of its coastline, current coastal erosion, and a high density of coastal development. Higher sea levels will likely increase the severity of storm-related flooding in coastal and bay areas.
- Natural ecosystems, water supply and agriculture are also likely to be affected by warmer temperatures and associated changes in the water cycle. Climate-related habitat loss could lead to extinction of some threatened species.
- Warmer temperatures are expected to lead to both more intense rain events, and flooding. However, warmer temperatures will also lead to greater evaporation and transpiration of moisture, causing drier conditions, and periods of drought.

### **New Jersey Greenhouse Gas Goals**

<http://www.nj.gov/dep/dsr/trends2005/pdfs/climate-change.pdf>

By 2007, the global atmospheric concentration of CO<sub>2</sub> had increased from its pre-industrial level of 280 ppm to 386 ppm. Under varying modeling scenarios current forecast predict that 450 ppm, a critical threshold level of CO<sub>2</sub>, will almost certainly be reached within 30 years without serious CO<sub>2</sub> mitigation efforts. Concentrations of CO<sub>2</sub> above 450 ppm are predicted to produce dangerous climate disruptions.

New Jersey has begun a major effort to reduce GHG emissions by the following actions:

- Governor Corzine signed Executive Order No. 54 and the New Jersey Global Warming Response Act. These directives establish a limit for 2020 emissions equal to 1990 levels and a limit for 2050 emissions of 80% below the 2006 level. Much of the reductions are outlined in the 2008 New Jersey's Energy Master Plan (EMP).

## **New Jersey Energy Master Plan**

In 2008 the *New Jersey Energy Master Plan* (EMP) was adopted to address energy challenges through investment in energy efficiencies, building a 21st century energy infrastructure, committing to innovative technologies, and creating new jobs. The EMP will make New Jersey more energy efficient and thereby reduce energy costs, increase reliability and reduce the harmful greenhouse gas emissions produced by NJ. The EMP proposed to reduce carbon dioxide emissions to 56.1 million metric tons in 2020, compared to the 84 million metric tons that we would emit if we did nothing. This reduction goes beyond the requirements in the Global Warming Response Act to reduce greenhouse gas emissions to 1990 levels by 2020. <http://www.nj.gov/emp/>

### **Energy Efficiency Goals:**

- NJ plans to undertake a systematic effort to improve energy efficiency, by improving the energy performance of 300,000 buildings each year between 2008 and 2020.
- NJ will promote new laws, regulations and incentive/rebate programs that will make new buildings 30% more efficient and require more energy efficient appliances.
- NJ will educate the public regarding the benefits of energy conservation and energy efficiency, and work with the utilities and commercial/industrial users of electricity to curtail peak electrical demand times.
- Through an investment of approximately \$33 billion by 2020 into our energy infrastructure, NJ will create more than 20,000 jobs by 2015, including energy auditors, energy service contractors, appliance manufacturers and installers, electricians, insulation installers, window installers, EnergyStar home developers and builders, and engineers.
- Save electricity equivalent to the amount of power to run 2.2 million homes for a year (20,000 GWh).
- Save heating energy equivalent to the amount of energy needed to warm 1.1 million homes in one year (110 trillion BTUs).

### **Renewable Energy Goal:**

- The 2008 EMP will accelerate that shift by increasing the portion of the electric supply that come from renewable sources including offshore wind, solar, onshore wind, biomass and new and emerging technologies.
- Strive to surpass the current Renewable Portfolio Standard goals with a goal of achieving 30% of the State's electricity needs from renewable sources by 2020.
- By 2020, New Jersey aims to generate 121 percent of its electricity from in-state generation sources. Of that, offshore wind would account for 13 percent, biomass 7 percent, and solar 2 percent.
- Fossil fuel-based generation would decrease from 50 percent in 2004 to 43 percent of the State's total electricity generation under the EMP. Combined heat and power, a more efficient form of generation that uses natural gas would account for 30 percent of the fossil fuel based generation.

### 3.4 Air Quality

The USEPA has been regulating air pollutants since the 1970 Clean Air Act utilizing human health-based criterion for setting permissible levels. Areas that do not meet these primary health standards are referred to as non-attainment areas. Based upon nationwide comparisons New Jersey suffers from poor air quality; however, the NJDEP reports that over the years, the air quality in New Jersey has been improving significantly. The air quality in Bergen County is assessed based upon historical air quality monitoring data available from the NJDEP's air quality monitoring network. Bergen County has been designated by the USEPA as non-attainment area for ground-level ozone. Air quality degradation is due to the type and density of industry, the density of population, and the general reliance upon automobiles.

The following information was obtained from the NJDEP Trends Report and the NJDEP Air Quality Report, 2005.

<http://www.state.nj.us/dep/dsr/trends2005/>  
<http://www.state.nj.us/dep/airmon/taqpage.htm>  
<http://www.state.nj.us/dep/airmon/05rpt.htm>

Link for air monitoring data for Bergen County  
<http://www.state.nj.us/dep/airmon/nmetro.htm>

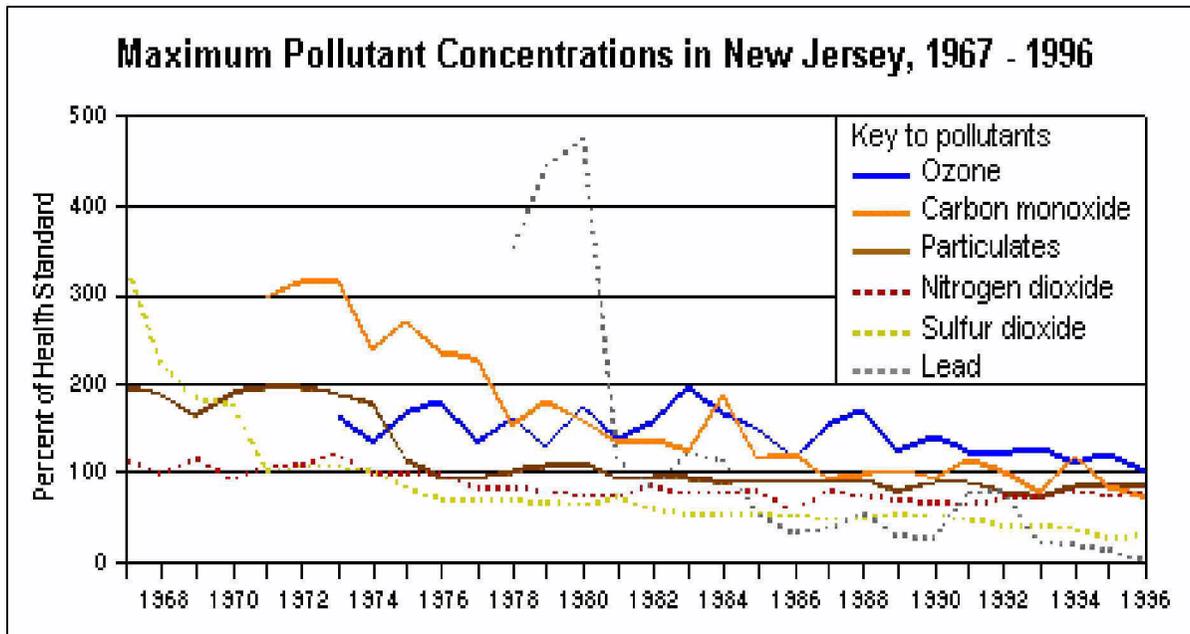


Figure 4: Maximum Pollutant Concentrations in New Jersey, 1967-1996

The Clean Air Act requires USEPA to set National Ambient Air Quality Standards for six common air pollutants. These commonly found air pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. **Figure 4** was obtained from the New Jersey Air Quality Trends report and it illustrates improved air quality concentrations for carbon monoxide, lead, nitrogen dioxide, ozone, particulates and sulfur dioxide, which have federal health standards. Lead, sulfur dioxide, and nitrogen dioxide had unhealthy levels 15 years ago, and now these pollutants meet the national health standards throughout the state. The annual ozone levels in New Jersey remains above the federal health standard.

### **Particulate Matter**

Overall the particulate line in this chart shows levels below the health standard throughout the 1990's, but some unhealthy days with high particulate levels generally occur each summer. More stringent particulate standards are now in effect, and the State is not expected to comply with the new standard. In 2005 thirteen New Jersey counties (out of 20) were classified as non-attainment areas for violating the Ambient Air Quality Standards. A ten county area in the Northeast section of the state near the New York metro-area has been classified as non-attainment areas for fine particulate matter. Similarly, 3 counties in the southwestern near the Philadelphia area also classified as non-attainment for fine particulates. NJDEP is currently evaluating strategies to improve air quality in these affected areas.

- Fine particles (PM<sub>2.5</sub>) -Particles less than 2.5 micrometers in diameter are called “fine” particles. Sources of fine particles include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes.
- Particulate matter (PM<sub>10</sub>) -Those less than 10 micrometers in diameter (PM<sub>10</sub>) are so small that they can get into the lungs, potentially causing serious health problems. Ten micrometers is smaller than the width of a single human hair.
- Coarse dust particles - Particles between 2.5 and 10 micrometers in diameter are referred to as “course”. Sources of coarse particles include crushing or grinding operations, and dust stirred up by vehicles traveling on roads.

### **Ozone**

Ground-level ozone affects our health, but ozone also forms naturally in the upper atmosphere, where it blocks some of the sun's ultraviolet light from reaching the earth. Ultraviolet light can cause sunburn and skin cancer, and can affect other organisms in the environment. This “good” ozone layer is being destroyed by pollutants like chlorofluorocarbons (CFCs) that leak out of air conditioners and refrigerators.

Ozone, when found at ground level, can be harmful to human health and the environment, ranging from eye irritation to severe respiratory distress that can lead to chronic illness and premature death. Ground-level ozone can lower your resistance to diseases such as colds and pneumonia. It can also damage lung tissue, intensify heart and lung diseases (such as asthma), and cause coughing and throat irritation. Even healthy

adults doing heavy exercise or manual labor outdoors may experience the unhealthy effects of ozone. People that are sensitive to ozone include the very young and those with pre-existing breathing problems. When ozone reaches unhealthy levels, children and people with asthma are most at risk.

Ozone can have a negative effect on the environment, particularly plant life, resulting in crop and forestry losses. In addition, ozone has the ability to produce cracks in rubber and destroys exterior paint on buildings, motor vehicles and boats. The effects of ozone result from it being a strong oxidant. Unlike many other air pollutants, ozone found in the lower atmosphere is not emitted directly but forms from other chemicals in the air that react together on hot, sunny days. The primary ozone precursors are volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>). NO<sub>x</sub> is primarily emitted by motor vehicles, power plants and other sources of combustion. VOCs are emitted from sources such as motor vehicles, industrial facilities, consumer and commercial products such as paints and coatings. Ground-level ozone formation is mainly a daytime problem during the summer months because it is greatly increased by warm temperatures and abundant sunlight. Weather patterns have a significant effect on ozone formation and hot, dry summers will result in more ozone than cool, wet ones. In New Jersey, the ozone season runs from April 1 to October 31.

To date, reducing emissions of volatile organic compounds (VOCs) has been the primary means of lowering concentrations of ground-level ozone in New Jersey. These included reductions in the volatility of gasoline, the installation of Stage II vapor recovery systems at gasoline stations, and the implementation of regulations to reduce the volatility of architectural coatings. Improvements may have leveled off in recent years, especially with respect to maximum eight-hour average concentrations. Significant further improvements in ozone levels will require reductions in both VOCs and nitrogen oxide (NO<sub>x</sub>). The NO<sub>x</sub> reductions will have to be achieved over a very large region of the country because levels in New Jersey are dependent on automobiles and emissions from out-of-state upwind sources.

#### **Air Quality Monitoring: The AQI Scale**

Five pollutants are monitored hourly in New Jersey for the Air Quality Index (AQI): carbon monoxide, nitrogen dioxide, ground-level ozone, particulates and sulfur dioxide. The AQI are reported on statewide websites and are generally reported on local news broadcasts. The AQI compares the air levels to health standards and assigns a rating such as good, moderate or unhealthy warnings. In 2005 the AQI ratings for New Jersey included 125 “Good” days, 211 were “Moderate”, 27 were rated “Unhealthy for Sensitive Groups”, 2 were considered “Unhealthy”, and zero were rated “Very Unhealthy”. This indicates that air quality in New Jersey is considered good or moderate most of the time, but pollution is still bad enough to adversely affect some people on about one day in thirteen. <http://www.state.nj.us/dep/airmon/aqi05.pdf>

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### 3.5 State Plan And Policy Map

The New Jersey State Development and Redevelopment Plan, commonly known as the State Plan, is a planning tool promulgated by the State Planning Commission and the Department of Community Affairs -Office of Smart Growth. The State Plan is designed to provide a comprehensive development projection that balances growth and conservation. The State Planning Act states that “environmental resources should be conserved because the protection of environmental qualities is vital to the quality of life and economic prosperity.” All New Jersey governments are encouraged to review their plans with the goal of bringing them into consistency with the provisions of the State Plan. Additional information is available online at <http://www.nj.gov/dca/osg/plan/>

The State Plan is driven by the identification of land areas and designation of future land uses. These designated land areas are known as Planning Areas, which are distinct geographic and economic units based on level of development and important natural resources based on a variety of environmental criteria. Each Planning Area has specific intentions and Policy Objectives that guide the application of Statewide Policies. The State Plan established five distinct Planning Area designations to help guide future growth:

- **Areas for Growth include:** Metropolitan Planning areas (Planning Area 1), Suburban Planning Areas (Planning Area 2) and Designated Centers in any planning area.
- **Areas for Limited Growth:** Fringe Planning Areas (Planning Area 3), Rural Planning Areas (Planning Area 4), and Environmentally Sensitive Planning Areas (Planning Area 5). In these planning areas, planning should promote a balance of conservation and limited growth—environmental constraints affect development and preservation is encouraged in large contiguous tracts.
- **Areas for Conservation:** Fringe Planning Area (Planning Area 3), Rural Planning Areas (Planning Area 4), and Environmentally Sensitive Planning Areas (Planning Area 5).

Representatives for the Borough actively participated in the 2005-2007 State Plan Cross Acceptance process to clarify inconsistencies and proposed significant modifications to the Planning Areas designations, and projections for future growth in the community. The Borough requested that the community be designated as a Fringe Planning Area 3 (PA3) and Community Center, serviced by limited water and sewer, but also containing significant Critical Environmental Sites (CES) and Historic and Cultural Sites (HCS) that require preservation. However, the New Jersey Office of Smart Growth continued the long established designation of the Borough as a Metropolitan Planning Area 1 (PA1) designation in its entirety, as depicted on (Figure 5) the January 2008 State Plan map for Bergen County. And the sensitive environmental and cultural resources were not mapped separately.

### 3.6 Land Use / Land Cover

Land Use/Land Cover (LU/LC) is a two-tiered classification system that systematically defines similar land areas according to land utilization and vegetative structure. This is an EPA and NJDEP approved method known as the Anderson Classification (Anderson 1976). LU/LC is an important descriptor of any area because it documents natural features, anthropogenic activities and environmental characteristics. The data set was created by combining existing information about land use with current aerial photographs and digitizing the results. The NJDEP LU/LC database was created using 1986 data and was subsequently updated in 1995/1997 and in 2002. Information presented in this report is based mainly on this 2002 database, and may be outdated.

The value of the LU/LC coverage is its reasonably accurate portrayal of development and land cover patterns within the Borough (e.g., high-density residential areas, commercial development and wetlands) and its easily manipulated hierarchical classification scheme. This data can be valuable in depicting and planning development trends. In addition, LU/LC coverage can serve as a basis for estimating pollutant loads in stormwater runoff.

#### **Land Use in New Jersey**

New Jersey is the most developed state in the nation, with 29% percent of its land converted to urban uses (NJDEP 2005 Environmental Trends Report). The NJDEP Trends report provides an overall assessment of the state's environmental health, and states that, *"Of all stressors to the environment, the conversion of undeveloped land may pose the highest ecological risk to New Jersey's environment and people. The physical alteration of habitat, a consequence of land use change, is one of the most compelling ecological problems in New Jersey. Statewide, habitat loss, fragmentation and introduction of invasive exotic species are leading the species loss and permanent destruction within several of the state's ecosystems."*

The 2005 NJ Environmental Trends Report ([www.state.nj.us/dep/dsr/trends2005](http://www.state.nj.us/dep/dsr/trends2005)) estimated that:

- Each year New Jersey adds over 15,000 acres of new development, while losing more than 9,000 acres of forest, 5,000 acres of farmland, and 1,000 acres of wetlands.
- An average of 50 acres is developed each day, equal to approximately 41 football fields daily.
- If current trends continue, New Jersey will reach full build out within the next 40 years.
- In addition to habitat loss, wildlife habitats are also fragmented and degraded from nearby developments, roadways, and other human disturbances.

As New Jersey continues to experience growth, it is also imperative that steps are taken to ensure that remaining areas of natural significance be preserved for their resource potential, their educational and research use, and their aesthetic and cultural values for present and future generations.

### **Land Use in the Borough of Franklin Lakes**

Based on the 2002 NJDEP LULC dataset, the Borough has a total acreage of 6,304 acres. A breakdown of land use acreage as based on the 2002 NJDEP LULC dataset is provided in Table 2. The largest land use within the Borough is urban lands and highway corridors, which cover 4,268 acres and comprise 67.7% of the community. Forests are the second most dominant land type with 1,230.9 acres (19.53%). Wetlands are the third dominant land type with 464.3 acres (7.37%). Water bodies (lakes, ponds, streams) include 286.8 acres (4.55%). Agricultural lands include 20.6 acres (0.33%) and 33.3 acres were identified as barren lands in 2002 (0.53%), which often refers to land undergoing development ([Figure 6](#)).

<b>Table 2: Land Use Acreage</b>		
<b>Land Use</b>	<b>Acreage</b>	<b>% Land Use</b>
Agriculture	20.60	0.33%
Barren land	33.30	0.53%
Forest	1230.90	19.53%
Urban	4268.10	67.70%
Water	286.80	4.55%
Wetlands	464.30	7.37%
<b>Total</b>	<b>6,304.00</b>	<b>100.00%</b>

It should be emphasized that this LU/LC GIS datalayer coverage (or any other coverage derived from LU/LC) has not been field-verified, either by NJDEP or Princeton Hydro, and thus may not be a wholly accurate representation of land uses and land covers within the Borough. The reliance on LU/LC data for site-specific projects is inappropriate because of the limitations of resolution scales and ongoing changes in development patterns over the span of even a single year.

### 3.7 Zoning And Development

The Zoning Districts for the Borough regulate land use, the type and intensity of development, limit and restrict the use of buildings and structures, regulate lot coverage, lot size, and lot dimensions. The current location and boundaries of zones and lot lines are depicted on the Borough Zoning map of 2007, which is kept on file in the planning board office (Figure 7). The zoning districts provide for uses of residential, multifamily residential, business, and commercial development.

The Borough is nearly built out and wide swaths of urban development and highways dominate the Borough. The major highways Route 287 and Route 208 cross the Borough. The limited remaining undeveloped lands include primarily forests and wetlands, which are generally located along waterways and on steep slopes. Future development will be constrained by limited available land, and capacity limitations for public water supplies; limited sewer capacities; and environmental restrictions for the floodplains, wetlands, and the riparian zones.

The Borough and County master plans support the revitalization of commercial town centers to promote economic development, and these plans promote the adoption of policies that encourage:

- investments in improving commercial centers
- improve streetscapes
- increasing opportunities for pedestrian and bicycle mobility

The New Jersey Department of Community Affairs has sponsored programs by the Downtown Revitalization Institute, which offers training to municipalities on utilizing local resources, developing the image of a community's business district and promoting it in economical ways. Officials from the Borough may consider attending similar workshops.