

By Reut Snir, Israeli Environmental Lawyer and Global Warming Consultant to National Environmental Trust.

## Israel's Unique Geography and Climate Is Vulnerable to Climate Change

Global climate change poses serious environmental, human health, and economic threats, and its effects will be strongest in regions with scarce resources.

Although Israel is very small (the size of New Jersey), it supports a wide variety of plant and animal life that compete for survival. This concentration of ecological diversity together with growing populations means that Israel and the Middle East region are particularly vulnerable to the effects of climate change.



### OBSERVED CLIMATE CHANGE IMPACTS

Like the rest of the world, the “Land of Milk and Honey” faces the challenges of climate change. Indeed, in the last 40 years several changes have been observed:<sup>1</sup>

- Minimum and maximum summer temperatures have increased by 1°C, while winter temperatures have declined.
- The probability of very hot summer days has increased threefold, with temperatures exceeding 35°C (95°F) in Jerusalem (average high temperature is 21°C or 79°F).
- Rainfall has increased in the center and south of the country, leading to floods and runoff, and has declined in the Kinneret basin, where available water in winter time has decreased by 150 cubic millimeters (from 500 to 350 cubic millimeters).<sup>2</sup>

#### FAST FACTS

- ✓ 1998 - hottest summer measured in Israel
- ✓ 1999 - heat wave in December
- ✓ 2000 - heaviest snow fall in the Negev
- ✓ 2000 - hottest July with 41°C (~106°F) in Jerusalem

- The frequency of extreme events – major rainfalls, very hot days and years which are either exceedingly wet or dry – has increased.
- Sea level has risen by 10 mm/year along the Israeli Mediterranean coast.<sup>3</sup>



Flash flood in the Judean desert



Desertification



Flooding. Tel Aviv beach, 2004

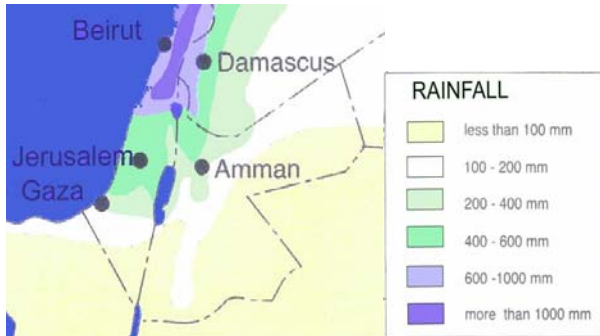
## PROJECTED CLIMATE CHANGE IMPACTS AND IMPLICATIONS

### Temperature

- Global and local climate models for Israel project an increase in temperature of 3°-5°C by the end of the century.<sup>4</sup>

### Precipitation and Water Resources

- Global and local climate models for Israel project a 10%-30% reduction in current annual average rainfall (see map below).<sup>5</sup>



- Water supply is expected to fall to 60% of current levels by 2100, due to sedimentation in reservoirs, salinization, and the lack of reservoir recharge.<sup>6</sup>

### Land and Agriculture

- Increased rain intensity combined with a reduction in overall precipitation will diminish vegetation cover and increase surface runoff, leading to desertification, especially in the Negev.
- Reduction in precipitation, variance in rain intensity, frost, and plant diseases and insects are only a few of the challenges that climate change imposes on agriculture. Sector profitability is likely to decrease by 5% by 2020, 11% by 2050, and 20% by 2100 compared to profits in 1975.<sup>7</sup>

### Sea Level Rise and Heritage Damage

- Projected sea level rise of 10 mm/year is expected to cause the coastline to retreat about 2 to 10 meters, a loss of 0.4 to 2.0 square kilometers of Israeli land every 10 years.<sup>8</sup>

- Beaches, coastal reserves, and other areas that provide public recreation and leisure would be most affected.

- Substantial damage is also anticipated for ancient coastal cities such as Cesarea, Apollonia, and Ashkelon Walls.

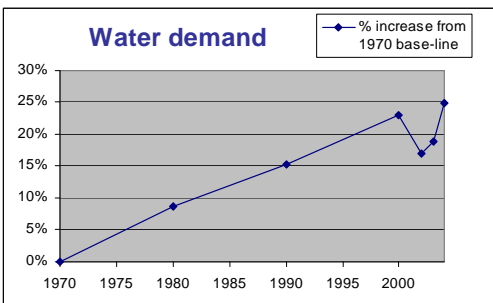


The collapse of the facade wall of the Apollonia barrow

### AN OVERALL IMPACT

While natural resources deteriorate, population continues to grow, as does the demand for water and arable land.

- ✓ With an annual population growth rate of 1.8%, 7,150,000 people (not including the Palestinian Territory and non-immigrant foreigners) now live in Israel.
- ✓ Water demand increased at a rate of 8% between 2002 and 2004.



- ✓ Peak energy-demand increases every year by 7.5%.

<sup>1</sup> Yeshayahu Bar-Or, Presentation for Preparing to Climate Change in Israel – Based on the International Experience at the Conference on Climate Change Impacts in Israel – Toward a National Action Plan, slides 27-28, (June 2006), <[www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/baror\\_1.pdf](http://www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/baror_1.pdf)>.

<sup>2</sup> Meir Rom *et al.*, Presentation on the Hydrological Changes and Trends in the Kinneret Basin 1970-2006 at the Conference on Climate Change Impacts in Israel – Toward a National Action Plan, slide 25, (June 2006), <[www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/rom\\_1.pdf](http://www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/rom_1.pdf)>.

<sup>3</sup> Micha Klein *et al.*, *Recent Sea-Level Change along Israeli and Mediterranean Coasts*, 60-61, HORIZONS IN GEOGRAPHY, 167, p. 175 (J.O. Maos *et al.*, eds., *Contemporary Israeli Geography*, 2004).

<sup>4</sup> Pinhas Alpert, Presentation on Climatic Trends in Last Decades and Future "Projections" – Israel at Conference on Climate Change Impacts in Israel – Toward a National Action Plan, slide 40, (June 2006), <[www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/alpert\\_1\\_1.pdf](http://www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/alpert_1_1.pdf)>.

<sup>5</sup> Pinhas Alpert *et al.*, *An Extreme Change in Israel's Climate*, 98 *Galileo* 46, pp. 49-50 (October 2006).

<sup>6</sup> Israel's First National Communication on Climate Change – Submitted under the UN Framework Convention on Climate Change, 2000, p. 23. <[www.sviva.gov.il/Environment/Static/Binaries/index\\_pirsumim/p0110en\\_1.pdf](http://www.sviva.gov.il/Environment/Static/Binaries/index_pirsumim/p0110en_1.pdf)>. 23.

<sup>7</sup> Bar-Or, *Op. Cit.*, slide 37.

<sup>8</sup> Klein *et al.*, *Op. Cit.*, p. 175.