

# Expanding NAWAPA XXI: Weather Modification To Stop Starvation

by Benjamin Deniston

July 31—Lyndon LaRouche has recently emphasized the need to accelerate the proposed construction of the North American Water and Power Alliance (NAWAPA) for the very survival of the United States.<sup>1</sup> Because of the Anglo-Dutch-directed environmentalist coup against our nation-building, pro-growth traditions typified by the presidencies of Franklin Roosevelt and John F. Kennedy, the United States is suffering from a long-building water crisis.<sup>2</sup> Options for new water supplies have either been blocked or ignored, and supplies of groundwater (the only source for entire sections of the West) have been over-used and abused.

This now poses an existential threat to food production and supplies, exacerbated by the genocidal continuation of the biofuels insanity, converting precious cropland to fuel production, while millions starve.<sup>3</sup>

Given the level of crisis, all available scientific capabilities should be applied to the defense of the water, food, and livelihood of the people of North America, including systems to influence and control the weather. Weather modification systems can bring rain to regions of the West where it is desperately needed, providing near- to medium-term emergency relief, and can be designed to operate in conjunction with the nuclear-powered NAWAPA XXI system as it is being constructed and implemented.

This technology is not the more familiar cloud-

seeding; it relies on ground-based electrical systems which ionize local regions of the atmosphere, allowing for the controlled modulation of the ionization level of the atmosphere, which in turn, affects water vapor condensation, cloud formation, latent heat release, the local conductivity of the global electric circuit, and related processes affecting the weather.

This is not a theoretical project. Already, ionization systems have been used to increase rainfall in regions of Russia, Mexico, Australia, and the United Arab Emirates (plus additional operations in other nations that have not been made public)—providing multiple, independent demonstrations that have shown significant levels of success.

For the United States, similar systems can be integrated with the NAWAPA XXI ocean-continental water-management system, enhancing the principle of NAWAPA itself:

*To provide greater control over the water cycle of the North American continent and its surrounding oceans (bringing the water to the needed locations while ensuring that excess water does not burden the regions where it is not needed); and, above all, increasing the productivity of that water, by ensuring its participation in a greater density of photosynthetic, biological, and human economic activity, raising the value and the productivity of the North American continent.*

It is possible that ionization-based systems could accelerate that process, by influencing the existing air moisture and rainfall patterns. While this could even provide some short-term relief from the immediate drought conditions, the ultimate success absolutely depends upon the central role of NAWAPA XXI.

With the existential and deadly threat of water and food shortages plaguing this nation, it would be criminal to refuse to seriously investigate all scientific options available to mankind for alleviating the crisis.

1. See the full report, “NAWAPA XXI,” and extensive video and written background material at <http://larouchepac.com/infrastructure>

2. See the LaRouchePAC feature film, “NAWAPA 1964” (<http://larouchepac.com/nawapa1964>).

3. See the following articles by Marcia Merry Baker: “Defeat London’s Biofuels Genocide Policy Now!” *EIR*, June 28, 2013 ([http://www.larouchepub.com/other/2013/4026biofuels\\_genocide.html](http://www.larouchepub.com/other/2013/4026biofuels_genocide.html)); “Anti-NAWAPA Water Policy Means Food Emergency,” *EIR*, May 31, 2013 ([http://www.larouchepub.com/other/2013/4022anti\\_nawapa\\_food.html](http://www.larouchepub.com/other/2013/4022anti_nawapa_food.html)); and “Food & Agriculture Crisis Fact Sheet: Restore National Sovereignty, End Famine-Depopulation Agenda,” *EIR*, Feb. 22, 2013 ([http://www.larouchepub.com/other/2013/4008food\\_ag\\_crisis.html](http://www.larouchepub.com/other/2013/4008food_ag_crisis.html)).

## The NAWAPA Principle

NAWAPA is a long overdue next step in mankind's improvement of the biospheric productivity and human economy of the North American continent. Going back thousands of years, the growth of the human species has been intimately tied to the deliberate control and improvement of water supplies. The governing principle has always been, and must continue to be, that man is increasing the productivity of the water cycle, as expressed in the increased use and re-use of water in productive biological or industrial processes.

*The idea that we simply "use up" fresh water is beyond silly.*

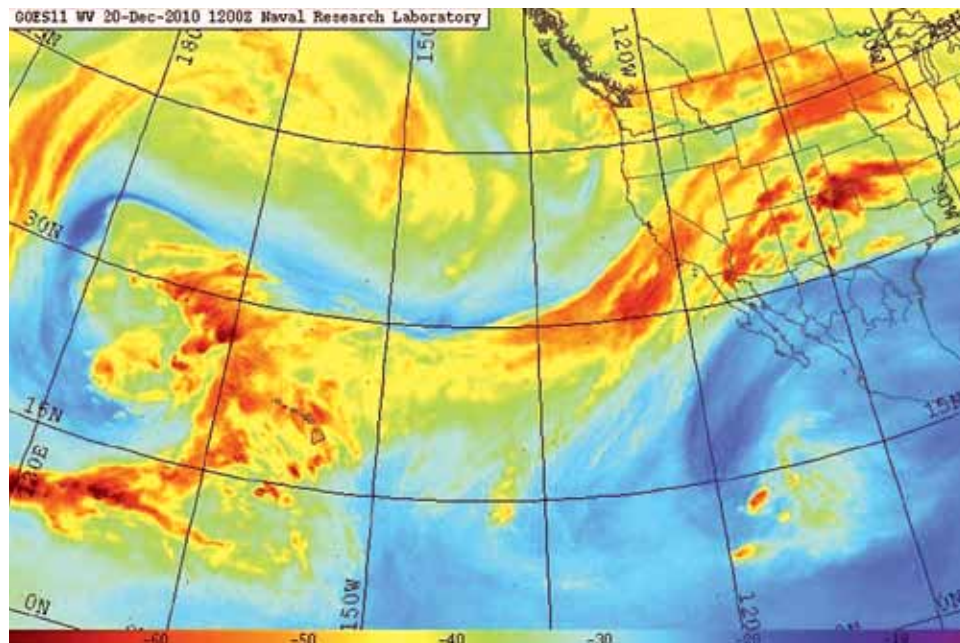
For example, the Sun does an impressive amount of work to evaporate huge amounts of water. Of the total amount of solar radiation reaching the Earth per day (173 million gigawatts), 25% of the energy flux goes into the continuous evaporation of water! This means a very large amount of water (and potential energy) exists in the form of water vapor, floating over our heads at all times.

While the quantity of water in the air is itself remarkable, so is the structure. Since the 1990s, scientists have known about "atmospheric rivers," narrow corridors or filaments of concentrated water vapor flowing high above the Earth's surface. These have been measured to occupy only 10% of the area of the mid-latitudes, but carry 90% of the moisture moving from the tropics to the poles—expressing concentrated structures, as opposed to a homogenous distribution.

Some atmospheric rivers bear a greater flow than the largest (land) river on Earth, the Amazon.<sup>4</sup>

When this water falls as rain over the land, it causes plants to grow, providing the source of the vast majority of the food requirements for mankind (except for sea-

FIGURE 1



US Naval Research Laboratory, Monterey, Calif.

*Water vapor over the eastern Pacific Ocean imaged by the GOES 11 satellite in December 2010. Notice the large atmospheric river aimed across California. This particularly intense storm system produced as much as 26 inches of rainfall in California, and up to 17 feet of snowfall in the Sierra Nevada, Dec. 17-22, 2010.*

food). The ultimate source of the rivers, lakes, and groundwater, is the process of evaporation and rainfall.

So, there is no "limited supply" of water, and water is not a resource that is getting "used up." Water need not be "the new oil," as some proclaim.

Mankind simply has to manage and improve the already existing larger cycles, because the unaided biosphere is not always effective in its hydrological distribution.

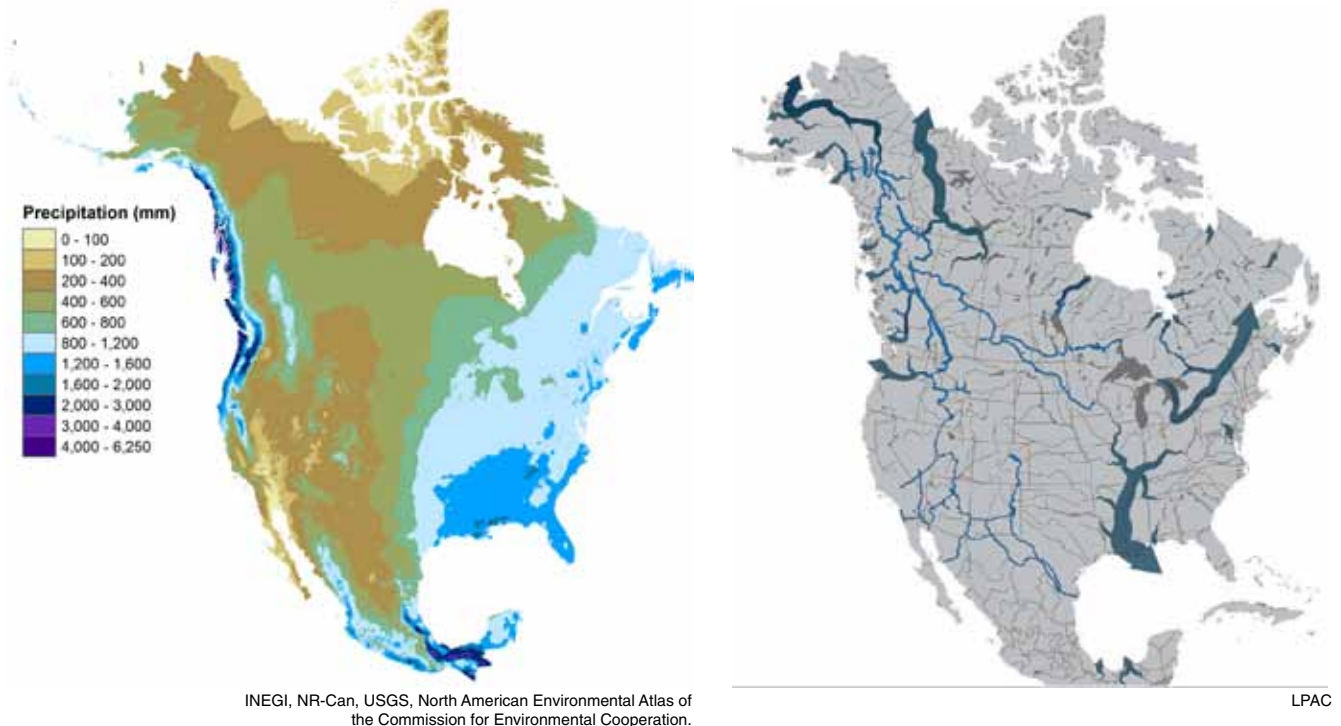
For example, as pertains to NAWAPA, the natural wind, ocean, and geological systems of North America result in a severe discrepancy in the distribution of fresh water across the western half of the continent. As seen in **Figure 1**, a narrow strip of the coastal region, from Alaska, through Yukon, and down to Washington State, receives a density of rainfall much greater than anywhere else in the Western or Southwestern United States, while the related northern water basins of Alaska, British Columbia, and Yukon provide 40 times more fresh water runoff than the entire U.S. Southwest and northern Mexico. Unfortunately, much of this northern water quickly runs off into the ocean with little or no productive use by the biosphere.

4. [http://tenaya.ucsd.edu/~dettinge/atmos\\_rivers.science.pdf](http://tenaya.ucsd.edu/~dettinge/atmos_rivers.science.pdf)

FIGURE 2

**North American Annual Precipitation • 1950 - 2000**

**The NAWAPA System**



Left: Annual precipitation for North America. Right: The NAWAPA System—the arrows are scaled to the current freshwater runoff rates for all the major river systems of North America (notice the utter lack of runoff in the West and Southwest).

What a terrible waste of the Sun’s work!  
 NAWAPA, planned in the 1950s and ’60s, would dramatically increase the biospheric productivity per square kilometer of the western half of North America, by redistributing 20% of the otherwise wasted fresh water runoff from coastal Alaska and British Columbia into the Southwest, with a relative handful of dams, a series of natural canals and rivers, and the construction of tunnels, pumps, and related systems. Much of this water would eventually return to the ocean, but, thanks to NAWAPA, it would first participate in photosynthetic, biological, and economic processes, many times throughout the Southwest, greatly increasing the productivity of the water cycle (**Figure 2**).

Since NAWAPA was not constructed when it was first proposed, the interconnected water and food crises have become existential. And Lyndon LaRouche, after calling for a relaunching and upgrading of the NAWAPA project in the Fall of 2010, has continued to emphasize that the construction and implementation must be rapidly accelerated—with nuclear power being a key

driver to increase the capabilities and rate of development of the NAWAPA system.

According to the original Parsons design, NAWAPA was expected to take 20-30 years to construct. LaRouchePAC’s assessment, in consultation with a committee of experts, is that that can be accelerated to 15-20 years (or perhaps even faster), depending upon the level of investment.

Whereas the original design called for releasing a significant amount of water from the system, down into the Pacific Ocean, to generate hydroelectricity to power the pump-lift components of NAWAPA, using nuclear power instead would mean that precious water would not have to be released into the Pacific for power generation, and the water available for distribution in the Southwest could potentially double.

Nuclear power can also provide large amounts of desalinated ocean water at key coastal regions, either feeding directly into NAWAPA or providing another sub-component of the continental system.

In general, nuclear power provides the highest level of energy-flux density immediately available, and must

be utilized to accelerate and strengthen the NAWAPA system.

Within this commitment for the construction of NAWAPA—itself centered on creating a more intense and productive utilization of the water cycle of the continent as a whole—weather modification systems can be utilized to further expand the deliberate management and control of the moisture cycles.

### Weather Modification via Ionization

The basis for the weather modification systems discussed here lies in what could broadly be associated with the electrical, ionization, latent heat, and related properties of atmospheric and weather systems, and the effects that additional ionization and electrical inputs can have on these systems.

For example, as early as 1989, one of Russia's leading scientists in the field of solar-terrestrial physics, M.I. Pudovkin, put forward the hypothesis that galactic cosmic radiation was affecting the Earth's climate and weather.<sup>5</sup> Over the subsequent years, Pudovkin and his team became a leading group within a growing movement studying this Galactic-Solar-Earth interaction.<sup>6</sup>

In the West, this began being popularized in the late 1990s, when the Danish physicist Prof. Henrik Svensmark began to champion a new science of "cosmoclimatology." Svensmark and his associates showed very close correlations between changes in global cloud cover, and variations in galactic cosmic radiation, and proposed that the ionizing effects of cosmic radiation were playing a role in stimulating cloud formation, and thus affecting the climate.<sup>7</sup>

He posited that the ions created by galactic cosmic radiation become centers around which water vapor

can condense, and these growing clusters of condensation can build up to become clouds.

An important emphasis should also be placed on the effects of the condensation process itself. When water changes its state from gas to liquid form, it releases energy—referred to as latent heat release. The fact that fully one-fourth of incident solar energy is, in a sense, stored in the process of the evaporation of water, means there is a huge amount of potential energy throughout the atmosphere at all times, waiting to be released as heat when the water is induced to return to a liquid state.

The role of ionization in stimulating condensation, and thus, the release of latent heat, means that changes in ionization levels, in addition to having the potential to stimulate cloud formation and rainfall, can affect large stores of atmospheric energy. There are indications that this can even influence hurricanes and cyclones (see box).

Even though the exact details involved in the process leading from ionization to cloud formation have been the subject of academic debate for years, the reality of the food and water crises facing the American people demands the discussion leave the domain of academia, and enter active investigation and experimentation.<sup>8</sup>

*Can we effectively act upon these processes for purposes of weather modification? Specifically, can we control rainfall patterns?*

For decades now, one technique has been to construct towers supporting networks of thin electrical wires, through which specifically tuned currents produce an ionization of the immediately surrounding air. The ionized air then propagates into the surrounding atmosphere (either by wind, or by the electrical charges), affecting condensation, cloud formation, latent heat release, the local conductivity of the global electric current, and related processes.

In Mexico, these systems have been successful for years, with dozens of stations set up to increase rainfall in key regions, starting in the mid-1990s. As discussed below, these Mexican systems have been based on technology that originated in Russia, where it has also been successfully used (to increase the crop harvests in the Krasnodar region, for example).<sup>9</sup>

5. Correlations between solar activity and weather/climate had already been long documented, but with no satisfactory explanation for how the interaction occurs. Because the Sun (through its magnetic field) modulates the galactic cosmic radiation reaching the Earth, Pudovkin proposed that it was actually the cosmic radiation that was affecting the Earth's weather/climate, and the correlation with the Sun was due to the role of the Sun in affecting how much of the cosmic radiation reaches the Earth.

6. O.M. Raspopov and S.V. Veretenenko, "Solar Activity and Cosmic Rays: Influences on Cloudiness and Processes in the Lower Atmosphere (in Memory and on the 75th Anniversary of M.I. Pudovkin)," *Geomagnetism and Aeronomy*, April 2009, Vol. 49, No. 2 (pp. 137-145).

7. More clouds will reflect more sunlight, and cool the climate. See Henrik Svensmark and Nigel Calder, *The Chilling Stars: A New Theory of Climate Change* (Totem Books, March 2003).

8. See V.G. Bondur, S.A. Pulnits, G.A. Kim, "Role of Variations in Galactic Cosmic Rays in Tropical Cyclogenesis: Evidence of Hurricane Katrina," in *Doklady Earth Sciences*, 2008, Vol. 422, No. 7 (pp. 1124-28).

9. See Sergey Pulnits, "Weather Control? Yes, It Is Really Possible," *Russia Beyond the Headlines*, March 25, 2009 ([http://rbth.ru/articles/2009/03/25/250309\\_weather.html](http://rbth.ru/articles/2009/03/25/250309_weather.html)).

More recently, the United Arab Emirates has built similar systems, and trial stations have shown positive results in Australia. While there have been more successful demonstrations in other nations, these three publicly available cases will serve to make the point.

### Case Study: Mexico

In the 1990s, the then-director of the National University of Mexico's Space Research and Development Program, Dr. Gianfranco Bissiachi, began collaboration with a Russian scientist, Dr. Lev Pokhmelnikh, who had worked in weather modification since the 1980s. Supported by Heberto Castillo, then-president of Mexico's Senate Committee on Science and Technology, in 1996, Pokhmelnikh and Bissiachi oversaw

the development of an initial network of three ionization stations based upon Pokhmelnikh's designs (ELAT).<sup>10</sup> The initial results generated enough interest and support, that the system was expanded from three stations in 1999, to 21 by 2004.

In 2003, *Mass High Tech* ran an article discussing the potential use of ionization systems in the United States, based upon the precedent set in Mexico. It de-

10. In the early 1990s, after the fall of the Soviet Union, Pokhmelnikh started a company, Electrificación Local de la Atmósfera Terrestre SA (ELAT), based upon his weather modification techniques. See Adi Ignatius, "Rain, Rain, Go Away, Go Soak Someone Less Willing to Pay: Moscow Firm Offers Weather Made to Order," *Wall Street Journal*, Oct. 2, 1992; Andrew Higgins, "Out of Russia: For a Price, Even Weather Is Up for Sale," *Independent*, Oct. 9, 1992; and "Russian Scientist—Mexico's New Rain God?," Reuters, June 24, 1996.

## Cosmic Rays and Katrina

A 2008 study showed a relationship between galactic cosmic rays, solar activity, and the infamous hurricane Katrina, which devastated New Orleans in 2005.<sup>1</sup>

As described in the study, one key component in the intensity of cyclones and hurricanes is the temperature difference between the relatively warm ocean, compared with the colder upper atmosphere. A greater temperature difference leads to a more intense convection process, in which the warmer ocean air rises up to meet the colder air high in the atmosphere above.

In the case of Katrina, while the storm was out over the Atlantic Ocean, the Earth's magnetic field entered a period of intense fluctuation, known as a "geomagnetic storm."<sup>2</sup> Geomagnetic storms can, in turn, reduce the galactic cosmic rays entering the Earth's atmosphere, because the Earth's magnetic field generally acts to deflect charged particles like

galactic cosmic rays. This lowering of cosmic-ray flux reaching the Earth due to a geomagnetic storm is a well-known phenomenon, called a Forebush decrease.

The constant inflow of cosmic rays causes an ionization of the Earth's atmosphere, inducing condensation of water vapor, and the release of latent heat. Because this latent heat release plays an active role in warming the already cold upper atmosphere, if the cosmic-ray flux is reduced, so then is the ionization, condensation, and latent heat release—leading to a further cooling of the upper atmosphere.

As Katrina approached the Gulf of Mexico, the reduction of the cosmic-ray flux caused by the geomagnetic storm of Aug. 24-25 led to a 9°C drop in the temperature of the upper atmosphere, and a consequent increase in the intensity of the hurricane, since this increased the temperature difference between the warmer ocean and the now even colder upper atmosphere, resulting in increased convection and intensity.

In the context of discussing active weather modification, it is worth considering the possibility that perhaps such stores of potential energy (latent heat) could be actively modulated by mankind to defend our population against storm systems. If less ionization/condensation can lead to an intensification, then perhaps increasing the ionization/condensation could be used to weaken threatening storms as well?

1. V.G. Bondur, S.A. Pulinet, and G.A. Kim, "The Role of Galactic Cosmic Rays in Tropical Cyclogenesis: Evidence of Hurricane Katrina," *Doklady Earth Sciences*, 2008, Vol. 422, No. 2, pp. 244-249.

2. Geomagnetic storms are generated by strong outbursts of solar activity which bombard and rattle the Earth's magnetic field, causing fluctuations in the intensity.



scribes the success of the first Mexican ELAT ionization station as follows,

*“That country’s first ELAT station, in the drought-stricken state of Sonora, increased average rainfall from 10.6 inches to 51 inches in the first year; according to Mexican department of agriculture statistics. When a lack of state funds shut down the station the following year, area rainfall measured 11 inches. In the third year, with the station operational again, the area recorded 47 inches of rainfall. [In 2003 the technology was operational] in eight states in the driest regions of Mexico, and some areas [reported] a doubling or tripling of annual rainfall.”*<sup>11</sup>

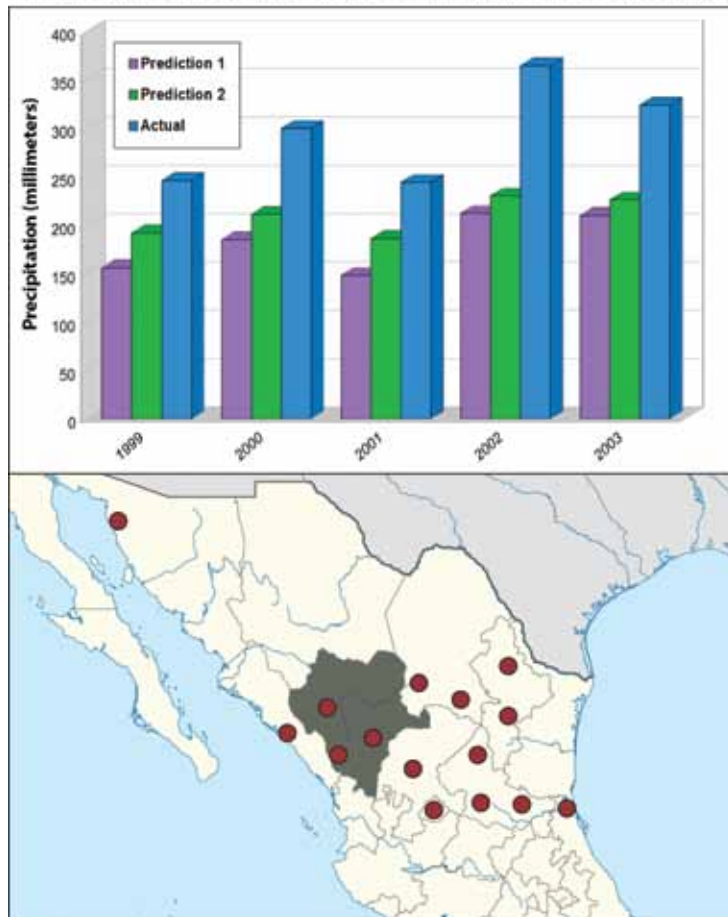
In 2004, *IEEE Spectrum* also covered these Mexico operations, citing a doubling of the average historical precipitation in Mexico’s central basin, resulting in a 61% increase in bean production in the affected areas. Bisiacchi is quoted saying that each station can affect weather up to 200 kilometers away.

A 2008 paper on the potential use of these ionization systems in Texas analyzed the rainfall levels in the central and southern regions of the Mexican state of Durango, which had benefitted from these systems for a decade (**Figure 3**). Each year from 1999 to 2003 showed a significant increase in rainfall over the expected levels. The authors of the paper calculated that there was less than a 1 in 400 billion chance that this could have happened by happenstance.<sup>12</sup>

According to the 2008 paper, following the successful demonstrations up to 2004, a meeting was held to discuss the technology with representatives of seven Federal agencies and of the nine states in central and northern Mexico which were using or planning on using the technology. This resulted in further support, including from the Mexican Council on Science and Technology, to fund the continued expansion of the network to 36 stations by 2006.

These systems have been so effective that they have also been used to put out fires over large areas of

**FIGURE 3**  
**Mexico Ionization Locations and Results**  
**ELAT STATIONS & PRECIPITATION IN DURANGO**



Based on information from “Artificial Atmospheric Ionization: A Potential Window for Weather Modification,” by Phillip Kauffman and Arquimedes Ruiz-Columbié, 2008.

*Top: Actual precipitation compared with two forecasts of expected precipitation based on historical records, for the central and southern regions of the Mexican State of Durango.*

*Bottom: Locations of ELAT ionization stations throughout Mexico (as of 2002); the shaded area is the state of Durango.*

the Yucatán Peninsula.<sup>13</sup>

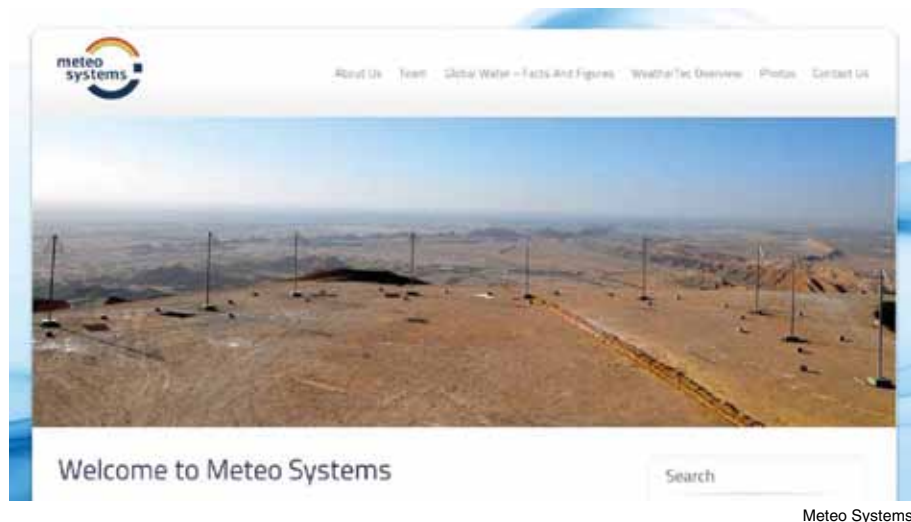
Before passing away in 2006, Bisiacchi expressed an optimistic vision for what mankind could do with such systems: “One of my dreams is some time to be able to go to Africa and stop the advance of the Sahara desert.”

11. Jay Rizoli, “Looking for a Change in the Weather?,” *Mass High Tech: The Journal of New England Technology*, March 10, 2003.

12. See Phillip Kauffman and Arquimedes Ruiz-Columbié, “Artificial Atmospheric Ionization: A Potential Window for Weather Modification,” 2008.

13. See Sergey Pulnits “Weather Control? Yes, It Is Really Possible,” *Russia Beyond the Headlines*, March 25, 2009 ([http://rbth.ru/articles/2009/03/25/250309\\_weather.html](http://rbth.ru/articles/2009/03/25/250309_weather.html)).

FIGURE 4



The Jebel Hafeet ionization station in the UAE, shown on the Meteo Systems website.

### Case Study: United Arab Emirates

In early 2011, a barrage of media reports covered a leaked, supposedly secret, weather modification program of the United Arab Emirates. The story broke when the London *Sunday Times* detailed a contract with a Swiss company, Meteo Systems International, to build a series of ionization stations to bring rain to regions of the UAE, including the capital, Abu Dhabi (Figure 4).<sup>14</sup>

The initial coverage claimed evidence for successful operations in 2011, pointing to 52 unanticipated rain showers, and citing interest from numerous scientists involved. However, the level of publicity apparently spooked some people, and the head of Meteo Systems, along with other scientists involved in analyzing the project, refused to speak about it, while subsequent media coverage was filled with “skeptical” reports, insisting such systems could never work.<sup>15</sup>

Still, the publicity generated some interesting coverage.

*National Geographic* consulted Peter Wilderer of the Technical University of Munich, who provided some useful background, saying, “ionization technology was first mentioned in 1890 by [Nikola] Tesla. In 1946 General Electric executed some field trials under

14. Rod Chayto and Jonathan Leake, “Looks Like Rain: Science Creates Downpours,” Jan. 2, 2011.

15. For example, see Jonathan Gornall, “Rumors and Rainmaking in Al-Ain,” *The National* of UAE, Feb. 3, 2011.

the leadership of [Bernard] Vonnegut. Later the technology was used for military purposes in the former Soviet Union.” Wilderer cited evidence he had seen from radar images, suggesting that ionization can generate some effects, but he couldn’t personally attest to the work of Meteo Systems.<sup>16</sup>

After the publicity died down, in 2012-13, Meteo Systems redesigned and opened up its previously private website, which now provides explanations of its work, locations in which it is trying out the technology, images of the systems, and assessments of what conditions are required for the systems to work.

According to the website, the company was started in 2004, ran trials in Switzerland in 2005, and then started trials in the UAE in 2006, and Australia in 2007, before getting funding from Sindicatum Sustainable Resources for an additional trial in Al-Ain, UAE. The website proclaims, “Meteo Systems’ WeatherTec™ is an old idea that has been developed and enhanced over years of scientific research and trials.”

### Case Study: Australia

In 2007, the Australian Rain Corporation was formed, with Meteo Systems as the major shareholder. In 2007-08 the Australian Government’s National Water Commission funded some initial trials, and in 2008, the corporation split off from Meteo Systems, and became Australian Rain Technologies (Figure 5).

From 2008 to 2010, Australian Rain Technologies ran three trial programs which included detailed statistical studies analyzing the effects:

**Paradise Dam, Bundaberg** (January-May 2008): Resulted in a 17.6% increase above anticipated rainfall in a 30° downwind arc from the system.

**Mt. Lofty Ranges, Adelaide** (August-November 2008): Produced an increased rainfall of 15.8% above the anticipated levels over a 120° arc downwind from the system.

16. Brian Handwerk, “Scientists Make Dozens of Storms in the Abu Dhabi Desert? Claims of Manmade Rain Clouds Spark Skepticism,” *National Geographic*, Jan. 18, 2011.

**Mt. Lofty Ranges, Adelaide** (August-December 2009): Generated an increase of 9.4% over an area roughly twice the size of the previous trials.<sup>17</sup>

Australian Rain Technologies has emphasized transparency of their data and evaluations, with an open access policy, and conservative, but statistically robust, estimations of the increased rainfall. In 2011, the company submitted a proposal to the Parliament's Standing Committee on Regional Australia, requesting \$11 million to construct 14 ionization stations distributed around two catchment areas in southeastern Australia (Gwydir River and Hume-Dartmouth catchment) to increase the rainfall going into the irrigation systems of the Murray-Darling Basin (one of the most significant agricultural areas in Australia, which is facing a major water shortage—largely on the basis of environmentalist-imperial policies).

They have extensive documentation available on their website.

### No Limits to Growth

Rainfall is not “created” from nothing. Ionization-based weather modification actually follows the same principle as NAWAPA.

As previously noted, the Sun is constantly working to evaporate massive amounts of water. On average, 280 cubic miles of water evaporate into the atmosphere every day. Since the atmosphere generally holds around 3,000 cubic miles of water, on average the same amount that evaporates must also fall back down—bringing 280 cubic miles (~1 billion acre feet) of water down in the form of rain onto the Earth's surface every day.

17. “Australian Rain Technologies (ART): Briefing to House Standing Committee on Regional Australia on trialling the potential contribution of ART's Atlant rainfall enhancement technology in the Murray Darling Basin,” January 2011. See “Appendix B: Results from four Australian trials” ([www.AustralianRain.com.au/Assets/Files/PDF/110323\\_RACsubmission.pdf](http://www.AustralianRain.com.au/Assets/Files/PDF/110323_RACsubmission.pdf)).

FIGURE 5



Australian Rain Technologies

*Since the Earth's surface is mostly water, the majority (77%) of the rain falls over the oceans, meaning most of the Sun's work producing fresh water goes to nothing!*

Water is most productive when it participates in human economic processes, or living processes such as photosynthesis.

However, of the total fresh water on the planet (which is only 3.5% of the total water, the rest being the saltwater of the oceans), only 0.003% is actively participating in living systems (that is only 0.0001% of the total water). As it fuels the entire biosphere, this water is the most productive of all, directly participating in the anti-entropic process of life.

To begin with, we must increase this percentage, by increasing the portion of the North American water cycle that participates in biological activity. But this is not the only metric with which to measure the productivity of the water cycle.

In a region dense with life, water will participate in plant life, evaporation, and rainfall, multiple times before returning to the oceans. Plants themselves will



release large amounts of water through their leaves, in a process called evapo-transpiration—in addition to pulling liquid water from the soil to utilize for photosynthesis; plants also release water into the air in vapor form, which can then fall back as rain, for more plants to then do the same.

Water is simply more active where there is plant life. The biological productivity of a region could be measured by the rate and concentration of this cycling—a *hydrological flux density*, if you wish—and mankind must work to increase this productivity of the North American water cycle as a whole.

NAWAPA does not “use up” more water, it directs existing water cycles towards greater participation in photosynthetic, biological, and economic processes. The original source is as continuous as the heat of the Sun—it is in the *process of allocation*, and resulting *levels of productivity*, that the power of man’s hand is desired. With NAWAPA, we are not just bringing water to dry regions of the West, we are creating this entire hydrological cycle. We are increasing the hydrological flux density of the Western regions, generating more green plant life, bringing moisture to the air, drawing in more moisture, and creating cooler climates in these regions to be blessed with life-giving water.

*Ionization systems designed for weather modification can work towards the exact same principle.*

The Pacific Ocean and the Gulf of Mexico provide the atmosphere with an immense amount of water vapor. If we take the area of the Gulf, and a quarter of the area of the Pacific, it is about 8% of the planet’s total surface area. Assuming we could say that this would then contribute 8% of the total evaporation (280 cubic miles per day), we would conclude that the resulting 23 cubic miles of evaporation per day from the Gulf, and one quarter of the Pacific, is much greater than the total fresh water runoff for all of North America (5 cubic miles per day)—let alone the fresh water runoff from the Southwest of the continent (0.026 cubic miles per day).

Admittedly, this is not a precise calculation, since the water does not evaporate at the same rate across the entire globe, and the evaporated water does not distribute itself homogeneously, as we saw with the atmospheric rivers discussed above. However, this back-of-the-envelope calculation serves to provide an order-of-magnitude concept of what we are dealing with: *The daily evaporation from the oceans surrounding the Western and Southern regions of North Amer-*

*ica is comparable with, and likely much greater than, the existing river runoff of the entire continent, providing an incredible source waiting to be tapped!*

As with NAWAPA—where we encourage some of the rain which falls in a very small coastal region of Alaska and Canada to come down into the Western U.S., and participate in photosynthetic, biological, and economic processes a few times before returning to the sea—so with weather modification we can entice some of the rain that falls over the oceans to instead fall over land, and do something productive with itself.

## **A Proposal**

Because this is being discussed in the context of the immense crisis facing American water systems and food production, there should be no question that it deserves further investigation.

As indicated in independent case studies, ionization systems could bring more rainfall to the regions of North America where it is desired, and the relatively small size and cost of such systems means they could become operational relatively quickly and integrated with a nuclear-powered NAWAPA XXI system—giving mankind revolutionary control over continental water cycles, and levels of productivity never before achieved.

To do this, an assessment of the entire atmospheric-hydrological system of the Pacific Ocean and North American continent should be made, including (but not limited to) wind patterns, atmospheric rivers, continental geography, ocean evaporation rates, existing and future irrigation and water management systems, rivers, and future water requirements.

This should result in a proposal for how many stations would be needed and where they should be located.

The biosphere alone has already done as much as it can. Only mankind can now act to increase the productivity of the entire water cycle and of the territory of North America, as measured in a greater percentage of the water cycle participating directly in living processes, and in an increasing density of participation and re-participation per unit time and per square kilometer of the total area.

The fresh water and healthy meals of millions now depend upon unleashing the full scientific power of mankind, to fulfill its intended role as the keeper of an improving biosphere.