St. Mark’s TS Counterplans (Grapevine)

## Shameless Plug

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## 1NC Baker Institute CP (Vision for Space Exploration)

**Text: The United States federal government should restructure the Orion program to reduce the size of the crew to three members; shift the Orion program to an X-38 lifting body with land-landing capability; and reinstate the Ares V heavy lift vehicle program.**

**The counterplan solves all of the case and the solvency deficits but does not bring back Ares I—that’s critical to shift NASA’s focus to international cooperation and HLVs—turns the case.**

**Abbey and Lane 9** (Neal Lane is the Malcolm Gillis University Professor and Senior Fellow of the James A Baker III Institute for Public Policy at Rice University and served in the Clinton Administration as Science Advisor to the President and Director of the National Science Foundation. George Abbey is Senior Fellow of the James A Baker III Institute for Public Policy at Rice University and former Director of the NASA Johnson Space Center in Houston Texas “Maximizing NASA’s Potential: In Flight and on the Ground Recommendations for the Next Administration.” http://bakerinstitute.org/publications/SPACE-pub-ObamaTransitionAbbeyLaneMuratore-012009.pdf //Donnie)

This is by far the most challenging element of the five-point plan. One approach to restructuring would be to switch the early focus from the moon and Mars to enhanced support of the international space station. A clearly stated rationale for the ISS, such as continued international cooperation on the peaceful uses of space, scientific research in particular, would be important. Extending space shuttle flights through 2015 would reduce reliance on Russia for transportation to the ISS and provide the large up-and-down mass capability needed by all ISS partners. The Constellation program would be restructured by canceling Ares I. Ares I, if successful, doesn’t offer much of an advantage over other Earth-to-orbit launchers and its development will take too long and use valuable funds. In addition, canceling other lunar surface-related work— including the lunar lander, the space suit, the rover, and other habitat and surface systems work—would focus the NASA workforce on immediate challenges. These activities can be resumed at an appropriate time in the future. Canceling human-Mars discussions would be a pragmatic statement that recognizes the incredible challenges of a Mars mission. Robotic missions to Mars should be flown exclusively, at least for the next decade, with extensive surface exploration by rovers. The present Orion program would be restructured to reduce the size of the new spacecraft to a three-member crew, Apollo-sized vehicle or an X-38 lifting body vehicle with land-landing capability. The smaller-sized vehicle would be flown on an Ariane 5 or Delta IV launch vehicle, with a planned 2014 or 2015 launch to the ISS. ₪ stopped here at 16:54 ₪ Moving to one of these launch vehicles allows a more rapid deployment by decoupling the new spacecraft from the development of a new launcher such as Ares I. Development of the new spacecraft would be accelerated by reducing the crew size and the need for weight efficiency, and taking advantage of previous Apollo and/or X-38 development. This significantly reduces the technical risk in many key areas, such as thermal protection and parachutes. Weight and technical risk can be further reduced by designing the service module for ISS service missions, making it simpler. Europe and Japan should be invited to participate as Europe participated in the X-38 program. Parts would be provided in return for services (i.e., future launches to ISS). In order to ensure this international participation is meaningful and effective, the recommendations stated in the recent National Research Council report, “Beyond Fortress America,” should be implemented. This report provides an excellent assessment of the impact of building walls that compromise our ability to access global science and technology and that adversely affect our ability to compete globally. The report makes recommendations to reform the export control process, ensure scientific and technological competitiveness, and improve the nonimmigrant visa system that regulates entry into the United States of foreign science and engineering students, scholars, and professionals. It calls for immediate action “to stem a serious decline affecting broad areas of the nation's security and economy.” By not investing in a unique Ares I Earth-to-orbit human launcher, NASA will be positioned to take full advantage of emerging commercial Earth-to-orbit transportation services should they develop in the 2015-2020 timeframe. In our restructuring approach, the shift in near-term focus from lunar to ISS would be followed by building a capability for deep space asteroid or comet intercept as a longer-term focus based on an Ares V heavy lift vehicle. The Ares V heavy lift launch capability is critical to any further deep space exploration. By canceling Ares I, it should be possible to focus all of the agency’s launch vehicle development capability on designing the one launcher needed by the nation for future deep space work, and the one launcher not anticipated to be provided by the private sector. All options for providing an Ares V heavyweight launch capability will be studied, including liquid boosters, liquid fly-back boosters, and international cooperative options. This should include the evaluation of options such as proposed by the Direct Launcher concept that makes use of most of the existing shuttle hardware, including the two solid rocket boosters and the external fuel tank. The only key modifications would be an Apollo-like capsule at the top and an engine at the bottom of the external fuel tank. Although Ares also uses shuttle parts, it is essentially an entirely new rocket. The ability to fly to an asteroid would give the United States a lunar capability should one be needed in the future. A deep space mission, such as a human asteroid or comet intercept, would effectively demonstrate American leadership in space, should that be a concern in the face of a possible Chinese landing on the moon. It might even be argued that an American lunar return would do less to question U.S. space leadership than a more aggressive goal of performing a human asteroid intercept mission. To advance this and other concepts, a joint NASA-DOD propulsion research program should be initiated, as propulsion is a limiting factor in space exploration. An aggressive program focused on innovative advanced propulsion development has been needed for a long time. A restructured human spaceflight initiative should be premised on the idea that any future plans by the United States to return women and men to the moon, and someday to Mars, will need to be top national priority. It should involve many U.S. federal agencies, universities, and industries, and be fully international in scope. By restructuring the human spaceflight initiative, resources will be made available to allow NASA to contribute to other vital short- and long-term national priorities.

## 1NC Geoengineering CP

**Text: The United States federal government should establish and contribute funding to an international entity, with oversight by the International Council for Science,** **dedicated to implementing projects to add necessary quantities of calcium hydroxide to global oceans and to enhance the reflexivity of stratocumulus clouds through the spraying of marine salt water on stratocumulus clouds.**

**It solves—**

**Ocean quicklime solves ocean acidity and sequesters CO2**

**Wired 8** (7/22, New Geoengineering Scheme Tackles Ocean Acidification, Too, http://blog.wired.com/wiredscience/2008/07/new-geoengineer.html, AG)

A scheme to dump quicklime into the oceans to sequester more carbon in their depths is being revived by a British management consultant with backing from Shell. First proposed back in the '90s by Exxon engineer Haroon Kheshgi (.pdf), the idea takes advantage of a series of simple chemical reactions. Limestone, at high temperatures, breaks down into carbon dioxide and quicklime, in a process that produces greenhouse gas. But dump that quicklime in seawater, and it absorbs roughly twice as much CO2 as was released in the first reaction. The heat required to decompose the limestone will probably come from fossil fuel, generating more CO2, but even so, the sum of the process could be a reduction of the CO2 in the atmosphere. "If we discover we've overshot the amount of CO2 the environment can cope with, the carbon-negative process I'm describing can reduce the amount of carbon dioxide in the atmosphere," said Tim Kruger, founder of Cquestrate.com, which has drawn seed funding from Shell and bills itself as developing an open source solution to climate change. Geoengineering projections have shown that it might be possible to stop the warming of the Earth, but the workable ones have had a big problem: the oceans. While schemes like shooting sulfur dioxide into the stratosphere to deflect some of the sun's energy could cool the Earth, they don't deal directly with the problem of carbon dioxide in the atmosphere. Regardless of the greenhouse effect, CO2 buildup will lead to ocean acidification, which could wipe out coral reefs and lead to large-scale oceanic ecosystem collapse. The quicklime scheme is different. It would go right at the heart of the CO2 buildup problem by removing the gas from the air and sequestering it in the world's oceans. It also makes the oceans more alkaline, directly combating ocean acidification. Of course, the scale of the project would have to be eye-poppingly large. The early calculations, Kruger told Wired.com, indicate that 56 billion cubic feet of limestone would be required to sequester each gigaton of carbon. Humans put out about 5.5 billion tons of carbon annually by burning fossil fuels, so a limestone offset budget could reach 300 billion cubic feet of limestone per year. The U.S. Geological Survey estimates limestone reserves as adequate for every country in the world. This scheme, however, would require a major ramp-up in lime production from the 300 million tons now produced in the world.

**Boosting cloud reflexivity blocks the terminal impacts of warming and gives us time to adapt**

**Ravilious 5** (Kate, The Guardian, Clouds could clear way to saving planet 2/10, http://www.guardian.co.uk/science/2005/feb/10/environment.society, AMiles)

Earth looks as if it is about to overheat. Temperatures are rising, ice sheets are melting and all the evidence points towards a greenhouse future. But what if we could reduce the planet's temperature? Would that give us some time to wean ourselves off fossil fuels and find alternative sources of energy? This is what a group of eminent atmospheric physicists and an engineer are proposing, and they have come up with an idea to halt the Earth's warming. Using nothing more than salt water and wind power, they have designed a device that will increase the reflectivity of some of the Earth's clouds, bouncing more incoming sunlight back into space. They argue that this natural heat shield could be turned on and off at will, giving us a vital extra few decades to sort out the mess we are in. John Latham, an atmospheric physicist based at the National Center for Atmospheric Research in Colorado, first came up with the idea about 15 years ago. "I outlined my idea in Nature, but at that time there wasn't a strong awareness of the global warming problem and so there wasn't a big response," he says. But more recently, the idea of a greenhouse world has become a dinner-party conversation topic and suddenly everyone is interested in ways of preventing the Earth from turning into a sauna. Together with colleagues, Latham has resurrected the idea and this time people are starting to take it seriously. Clouds come in different colours, shapes and sizes and occur at various altitudes; not just any old cloud will do. An increase in the high-level, wispy, cirrus clouds would actually have the opposite of the desired effect: making the Earth warmer as they trap more heat in. It turns out that the low-level, lumpy grey clouds, known as stratocumulus, are the best for the job, bouncing sunlight back into space, off their bright, shiny tops. Which is all very well, but how do you go about making stratocumulus cloud more reflective? Stephen Salter, the innovative Edinburgh University engineer, (known best for his invention of Salter's duck - the 300-tonne floating canister designed to drive a generator from the motion of bobbing up and down on waves) thinks he has the key. "We need to atomise seawater and throw tiny droplets into the air," he says. The idea is that this fine mist of sea-spray evaporates, leaving tiny particles of sea salt that get sucked up into marine stratocumulus clouds on rising currents of air. These little particles act as centres for extra droplets to form. "Clouds become more reflective if you increase the number of droplets in them," explains Latham. A bonus of filling the clouds with smaller droplets is that they tend to last for longer, reflecting more sunlight back into space, before they disperse. To produce this fine mist of sea spray artificially, Salter envisages thousands of unmanned yachts zigzagging across the sea, carrying equipment to make very choppy waves, known as Faraday waves. A high-frequency ultrasonic generator would spin seawater around inside a grooved drum, producing tiny waves that are thinner than a human hair. "It looks a bit like a cup of coffee on a rattling train, but it would be nearly vertical," says Salter. Once the waves are steep enough, drops of water are thrown up from their crests. "All we need to do is try and get these fine droplets into the first few metres of air, and meteorology will do the rest," says Latham. To remain truly environmentally friendly, the yachts would be driven by wind acting on the spinning drum, like a sail. Movement of the boat through the water would drive propellers acting as turbines, to produce the electrical power for spinning the drums and driving the ultrasonics. Meanwhile, satellites would direct their movements, placing the yachts in the areas of ocean where the most effective stratocumulus clouds could be modified. But would it really work? If calculations and computer models are to be believed, then yes, the physics of this idea is sound. Working together with Tom Choularton, of Manchester University, and Mike Smith, of Leeds University, Latham has done extensive calculations to make sure he has got his sums right. In addition, they have tested the idea using the Meteorological Office's Global Climate Model and shown that increasing the droplet numbers in marine stratocumulus clouds could have a significant effect.