Bill Ginn- TNC Chief Conservation Officer

Bill gave us an overview of the status of the Conservancy. Clearly these are difficult times and the organization has had to take a hard look at itself. TNC needs to be stronger, more progressive and focused on its key priorities i.e. the things TNC does very well, TNC has taken some prudent management steps and has made some staff cutbacks (a 14% reduction). The key themes that will be the focus of activity include:

1. The future of the world's oceans. The oceans have "great and extraordinary needs". There will be a concentration on the 6-nation accord on the Coral Triangle. A telling note was that more than 1.1 billion humans derive protein from the oceans and ALL of the world's fisheries are over exploited.
2. Fresh water. The access to fresh water is a defining issue in the world today. Bill referenced the excellent work of Caterpillar's "Great Rivers" program. TNC is also working with many people and organizations around the topic of "blue water certification" in an attempt to draw attention to companies and organizations that develop and adhere to "best water practices". More than 2.7 billion people live in overly stressed water sheds.
3. Conservation of lands and protected areas. This has been a core issue with TNC for more than 60 years and this emphasis will continue. Bill noted that next year will be the 100th anniversary of the National Parks Service. Bill also mentioned some of the international programs such as Cargill in Brazil that are effectively proactive and have resulted in significant offsets.
4. Climate Change. TNC will be very focused on two things: a) the future of forests with 20% of global carbon attributable to the loss of forests; and b) adapting to climate change with an emphasis on "nature based adaptation".

TNC will continue to be very connected to the ground—a hallmark of the organization. There will continue to be a focus on "PLACE". I was reminded of an often-used motto of TNC when I first became involved, "Saving the Last Great Places".

Jonathan Hoekstra—Lead of TNC's Climate Change Efforts.

Jonathan set the scene for our meeting designed to focus on the topic of climate change adaptation. For me, this was new terminology based on the realization that the world must face the issue of adaptation since there is now wide acceptance that climate change impacts are no longer abstract and off in the future. They are real, here and now. TNC efforts would focus on two parts of the equation 1) reducing greenhouse gases and 2) unavoidable impacts. Simply stated, the world is warming with an average increase in the West (US) at 4 degree F over the past 55 years. Even though this sounds like a small temperature increase, small increases have a large effect and the effects are now affecting people. Small changes cause species of to move and migrate further. In Bangladesh, the social impact has become apparent with many thousands of "environmental refugees". There is a socio-economic demarcation that is likely to result in poorer people being hit the hardest since they may live in some of the more vulnerable areas. With a majority of people living in coastal areas, even 2 deg F matters. Water stress will affect climate change through forest degradation and poorer carbon sequestration.

Slight warming in sea temperature will have a large impact on coral reefs (coral bleaching). Coral reefs can be affected differently depending on currents. Jonathan talked about eco-system services that must be protected and we must put nature to work to help mitigate and aid in climate change adaptation. In using this approach, we can "pre-store" rather than "restore". Some available strategies include:

1) Identifying and protecting unaffected areas
2) Connecting habitats
3) Protecting environmental gradients
4) Reducing other threats such as fire and flooding

His role is to create enabling conditions, public funding and the need to create and foster private sector partnerships. We need to understand how adaptation strategy may affect business strategies and the bottom-line. There are business imperatives for taking early actions in the most appropriate ways.

Chris Zganjar—Climate Change Information Specialist

We were introduced to a great piece of technology—**Climate Wizard**, a software predictive tool for climate change. Chris gave us an introduction to the tool explaining methodology and approach. We then had the opportunity to sit at a laptop in the back of the room and "experiment" by choosing geographic areas, types of forecasts and timeframes. This exercise was both educational and eye-opening.

Chris noted that a new version is now underway with the current version focusing on temperature change and precipitation change. New versions would increase granularity and will likely add sea level change as an output. The program incorporates and utilizes a vast amount of data and has been a collaborative effort with the University of Washington and the University of Southern Mississippi. The model tracks atmospheric changes by predicting on the basis of varying emission projections. The model can and will be used to check varying inputs of pending policy and law currently being debated.

Katie Dolan—Director Eastern New York Chapter of TNC

Katie discussed a project she has been actively involved in, **"Rising Waters and Coastal Resilience: A Case Study of the Hudson River"**. This was an excellent case study in that the Hudson Valley is 135 miles long, is 62% forested, has concentrated population and is subject to climate change as there is only a 4 foot elevation drop along its length making it highly subject to sea level rise.

The Rising Water project mobilized 160 Hudson valley representatives and applied a scenario developed at Royal Dutch Shell more than 25 years ago. This formal process is an excellent process for this type of exercise in that it does not attempt to forecast the future, but, instead, determines various scenarios that *could* unfold in the future. The process is an orderly way of looking at several definitive types of outcomes and then determines "signposts" that may tell us

what scenario may be unfolding as we move forward. [Note: I believe Peter Schwartz's book on the subject is called "The Long View"] The project considered a 20-year projection period. Local communities are now looking at scenarios in their own areas. [Note: This approach could also be applied by individual companies regarding possible business impacts of climate change]. Railroad company CSX is reviewing the bottom-line impacts on rail routes along the banks. They understand it makes good business sense to preserve (and alter if necessary) these critical rail systems.

Some overarching recommendations include:

1) Preparedness for extreme weather (working with organizations like the Red Cross)
2) Create natural solutions by applying green technologies
3) 50% of the Hudson has man-made banks and will be considered for potential improvements
4) Improve the resilience of the shorelines
5) Scenarios will be made more "story based" and not only fact and data-based. [Note: scenarios must be as comprehensive as possible]

The Hudson Valley plan will be revised in 2010. A major message from Katie was that we must apply an adaptation planning process. A challenge is how to scale-up the process:

1) Create and implement climate change "clinics"
2) Share best practices (this presentation was a good example)
3) Create a better connection with climate adaptation expertise
4) Eco-system services analysis
5) Interaction with emergency services (FEMA, Red Cross, insurance companies)
6) Improve LIDAR (coastal) mapping

Bruce McKenney—Senior Economic Advisor

Last year's ILC topic was Bio-diversity offsets. Bruce gave us an update and refresher on "Development by Design". The overall approach on the bio-diversity matrix (mitigation hierarchy) remains: Avoid—Minimize/Restore—Offset with a goal of achieving net positive contributions to bio-diversity.

TNC applies an eco-regional approach to investigate anticipated impacts [Note: this topic was originally presented by Joe Kiesecker] in identifying impacted areas and choosing potential offset areas—particularly looking at areas of conflict and particularly.

Among others, TNC has projects underway with companies involved in oil and gas, wind, coal mining, copper mining—including Mongolia and China. [Note: These are win-win approaches that can be incorporated in the EIS process to help the companies involved by providing an organized science-based approach]

The BP Jonah Gas Field offsets are now all in place (ILC Project visit last Fall). The key to this process in the offsets matrix is that a prescribed offset standard land ratio is NOT applied.

Offsets are based on restoration maturity which, in turn, is based on the regional modeling taking into account habitat and migration routes. More thought may need to be given to eco-system service values.

The next generation of mitigation policy will lead to more consistent and rigorous application, comprehensive landscape planning and compensatory mitigation planning. BLM policy is also evolving as conditions of permit and BLM required mitigation.

This presentation was timely in review but also timely in that bio-diversity offsets will by necessity be an integral part of climate change adaptation going forward. TNC continues to develop and refine tools to be applied to achieve desired outcomes by working with private sector developments.

Bob Bendick—Lead of TNC Government Relations Group

Bob gave us an introduction to policy considerations for climate change adaptation by asking the question, "Why is this a public policy issue?"

1) Health and natural systems have been a public responsibility
2) Fish and wildlife are publicly owned
3) Shared impacts cross boundaries of space and time
4) The science is just developing
5) Must be geared to near-term investment for long-term results tending to put this in the public arena.
6) Natural systems cross political boundaries

Current policy issues include:

1) Waxman/Markey cap ad trade legislation
2) USDA farm bill
3) US Fish and Wildlife strategies (developing
4) Army Corp of Engineers projects

We had an extended discussion on Waxman/Markey (see details in slide presentation).

The Army Corp of Engineers is working diligently on water resources, flood risk, sea level rise and coastal storm intensity. A Corp delegation recently visited The Netherlands to review the Dutch approach to sea level control. In terms of state, federal and research efforts, TNC is uniquely involved.

On Thursday, we shifted to energy issues as the world adopts new legislation and alternatives to fossil fuels with particular emphasis on land use and habitat impacts

Jimmie Powell—TNC Energy Team Lead

A few facts to start the discussion:

1) We must hold global temperature to 2 deg C over pre-industrialization levels
2) Global per capital emissions is 5 tons/person/year
    a. India 1.5 tons/person/year
    b. US 24 tons/person/year
3) It is a huge challenge to stabilize temperature rise
4) 70% of all emissions are from fossil fuels
5) The goals REQUIRE and energy change but the cost will be immense

Jimmie commented that there are many pathways we could follow. To provide some discussion he noted that some solutions could have a more negative impact than a rise in temperature. Following presentations highlighted some of these pathways.

Chris Namovicz—US Energy Information Service (Renewable Forecast Modeling)

Chris worked on the EIA Annual Energy Outlook report (AEO) based on current legislation and to review the possible impacts of new legislation i.e. Waxman/Markey. The AEO was updated in April as a result of stimulus issues providing additional funding for alternative energy. Most of the stimulus money is going to wind power. He noted that biomass and geothermal were not likely to grow much.

Chris pointed out some issues as part of Waxman/Markey:
1) By 2025, renewables must be 25% of electricity sales
2) If state exemptions are taken, the percentage drops to 21%
3) If efficiency offsets are taken, the percentage drops further to 17%

Lieberman/Warner Cap and Trade on CO2 targeting a 40% reduction by 2030

We had some discussion around Biomass. Chris defined biomass as: urban wood waste and mill residue; Forestry residues (rough cuts, barks, sawdust, etc); agricultural residues (wheat straw, harvest residue); energy crops (switchgrass, etc.) Currently there is not aggregator for biomass which makes it less attractive to energy generators. Consequently, there is not a lot of biomass growth in the model.

Geoff Blanford—Electric Power Research Institute (via telephone connection)

Geoff reported on his work with EPRI's MERGE model which provides a high level analysis of GHG policies. They analyzed policy scenarios at 50% below 1990 levels of CO2 by 2050 and at 80% below 1990 levels by 2050. MERGE assumes all emissions are capped with no offsets.

Model improvements will include and expanded resource base for natural gas, some improvements for grid integration which will yield some improvements. The model omits some issues including some small generators, load shape and peaks and some other energy policies.

By 2020, coal with carbon capture and sequestration becomes the bulk of coal utilization.

We saw projections that showed some major changes in the cost of carbon offsets in the two cases. Over the period the cost per ton increases dramatically to $240/ton.

There were some inconsistencies related to projections of demand reduction.

Details of the models are in the slide presentation.

Rob MacDonald—Lead for TNC Agricultural Work

Rob highlighted often publicly and politically overlooked land use impacts of various energy alternatives. Some of this work was truly eye opening. There are great implications of energy change. Rob used the term "Energy Sprawl" in reference to the total land use for various types of energy. He presented a land use intensity bar chart that was very enlightening. Nuclear has the least land use intensity and biomass and bio-fuels are the most intensive users. Also complicating the picture, each state has specific concerns about different energy proposals which yield unique concerns to their particular geography.

Three major concepts:

1) Try to avoid the tradeoff of less emissions and more land use
2) "Development by Design" as a guiding principle paying attention to the mitigation hierarchy (Avoid, Minimize, Offset) regarding biodiversity.
3) Energy Policy "picks" wildlife winners and losers. Policy affects the energy mix and the energy mix affects certain habitats, species and migration routes. Energy sprawl must be considered.

This presentation gave some important credibility to Jimmie Powell's conversation starter. It is important to look at the charts and graphs to get a feel for the wide variations in land use and future impacts.

Laura Crane—TNC California Lead for the Mojave Desert

Laura started with the fairly stark statement that within 100 years the Joshua tree could become extinct in Joshua Tree National Forest (the only remaining place on earth) due to climate change.

California's Mojave desert is the "bulls—eye" of solar power and is noted to be the "Saudi Arabia of solar energy". As one of the hottest, driest deserts in the world it is literally one of the best solar resources on the globe. With a quarter of California prospective acreage for renewable energy (wind, solar and geothermal), TNC is preparing for a 3000% increase (up to 1,000,000 acres of new development) on public lands.

Laura showed some startling aerial photographs of solar and wind farms in the Mojave noting that solar resources are totally fenced and ALL vegetation is removed. Wind projects take large tracts of land and require access for large vehicles and equipment to handle the massive blades of the wind turbines (100's of feet in diameter). Again, the aerial photo of the land use (including access roads) was startling.

The question was, "Can we develop renewable energy in the desert without adverse impacts on biodiversity?" California is a prime location for "Energy by Design". TNC's work has removed many areas from consideration for development due to high conflicts. That being said, it is possible to meet California's goals even with these large areas out of consideration. Ninety percent of California's renewable goals can be met with desert development. 85% of all land in the Mojave is federally controlled and 89% of all state lands requiring protection are federally held. Laura talked through a Venn-Diagram consisting of intersecting circles of Science, Policy and Place. This was a good summary of the needed approach. A gathering of diverse stakeholders agreed to four areas of the desert that warrant further consideration for development with a goal of "effective and enduring mitigation" while providing the necessary space for renewable development. The Mojave will likely be an effective case study and model for other areas.

Robin O'Malley—Director of Program Development, The Heinz Center

Robin provided some great insights on Bio-Energy futures with the admonition that "renewable" does not equate to "zero footprint".

The forest products industry creates a large amount of energy and 60% of its own needs are self-generated. I found it interesting that the US exports "pellets" for heat sourcing to Europe.

Robin provided some statistics for land use requirements:

Forest Product Harvest	11 million acres
Renewable fuels	2.3 million acres
Renewable electricity	15 million acres
Pellet/Heat applications	unknown

He also spoke to energy efficiency (energy out versus energy in) of various components of the energy mix--electricity alone being the poorest (18-25%), Heat alone (50-75%) and combined heat and power (60-90%) [Note: the high side numbers seem quite high from other sources I am familiar with]

Of note related to Bio-fuels, Robin noted some key potential impacts:

1) Land use changes and land stress
2) Water quality changes (cultivation and conversion uses)
3) Water quantity changes (noted that ethanol is a "water hog")
4) Bio-diversity impacts
5) Competition with existing industries
6) Carbon storage is negatively affected by bio-fuels burning

We need to be sure that legislation does not become a "ready, shoot, aim" approach. There was some feeling that some legislation may be in this category in our political rush to get things done.

Robin provided some cautions:

1) Recognize the multiple outputs of alternatives (energy, GHG, Nitrogen, jobs and $$)
2) Be realistic about supplies
3) Don't deny the footprint (identify, scope and avoid)
4) Do the numbers
5) Be skeptical about "marginal land" claims as there could be initially unrecognized eco-system services
6) Don't assume scale-up will be the same as "bench scale"
7) Engage stakeholders to achieve optimum results

Jimmie Powell—TNC Energy Lead

Jimmie ended the day by leading a discussion of potential energy priorities for The Nature Conservancy. It would be useful for ILC members to review Jimmie's list of potential priorities and comment.