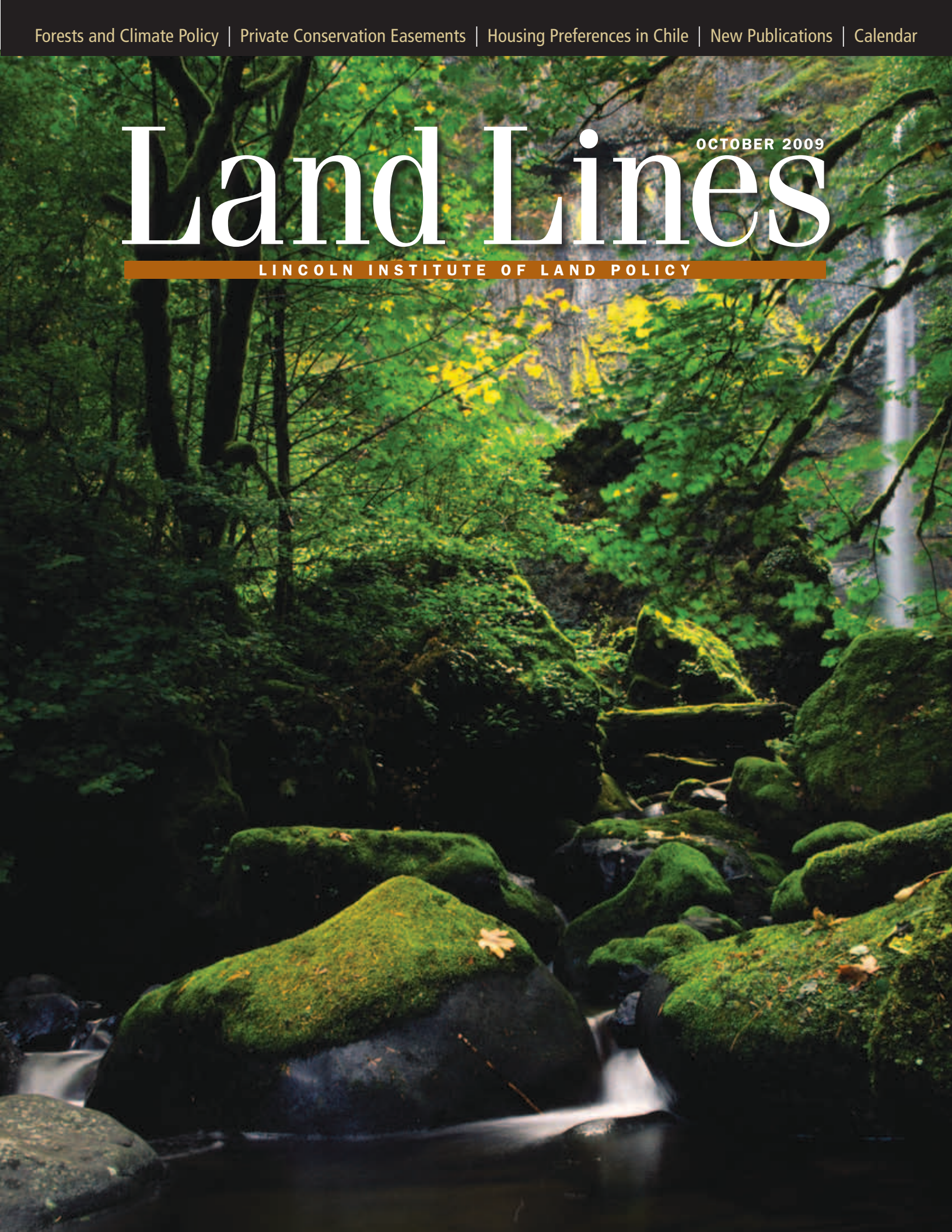


# Land Lines

OCTOBER 2009

LINCOLN INSTITUTE OF LAND POLICY



# Land Lines

OCTOBER 2009 • VOLUME 21, NUMBER 4

## EDITOR

Ann LeRoyer

## PRESIDENT & CEO

Gregory K. Ingram

## CHAIRMAN OF THE BOARD

Kathryn J. Lincoln

## PUBLICATIONS ASSISTANT

Robyn F. Salbo

## DESIGN & PRODUCTION

David Gerratt & Amanda Wait  
www.NonprofitDesign.com

The Lincoln Institute of Land Policy is a private operating foundation whose mission is to improve the quality of public debate and decisions in the areas of land policy and land-related taxation in the United States and around the world. The Institute's goals are to integrate theory and practice to better shape land policy and to provide a nonpartisan forum for discussion of the multidisciplinary forces that influence public policy concerning the use, regulation, and taxation of land.

We seek to inform decision making through education, research, demonstration projects, and the dissemination of information through publications, our Web site, and other media. Our programs bring together scholars, practitioners, public officials, policy advisers, and involved citizens in a collegial learning environment. The Lincoln Institute of Land Policy is an equal opportunity institution.

*Land Lines* is published quarterly in January, April, July, and October to report on Institute-sponsored programs.

## For More Information

The Lincoln Institute Web site ([www.lincolnst.edu](http://www.lincolnst.edu)) provides a variety of features that make it easy for users to quickly obtain information on land and tax policy issues and on specific education programs, research, and publications. The e-commerce function permits users to order publications and multimedia products and to register for courses.

You can create your own "My Profile" to download current and past issues of *Land Lines*, more than 580 Working Papers, and other materials posted on the Web site. After you have completed your profile, you can "Log In" at any time by entering only your username and password. To create a profile, go to <http://www.lincolnst.edu/login/createprofile.asp>.

Copyright © 2009. All rights reserved.

## Lincoln Institute of Land Policy

113 Brattle Street  
Cambridge, MA 02138-3400 USA

Tel: 617-661-3016 or 1-800-526-3873  
Fax: 617-661-7235 or 1-800-526-3944

E-mail: [annleroyer@lincolnst.edu](mailto:annleroyer@lincolnst.edu) (editorial content)  
[help@lincolnst.edu](mailto:help@lincolnst.edu) (information services)

Web: [www.lincolnst.edu](http://www.lincolnst.edu)

Cover: iStockphoto.com



**L** LINCOLN INSTITUTE  
OF LAND POLICY

## CONTENTS



## FEATURES

### 2 The Role of Forests in U.S. Climate Policy

LAURIE A. WAYBURN

*Forest loss is part of the climate problem, but forest conservation is part of the solution. The comprehensive inclusion of domestic forests in national climate policy is essential to achieving the country's goals to stabilize and reduce net emissions of carbon dioxide.*

### 8 Private Conservation Easements: A Record of Achievements and the Challenges Ahead

GERALD KORNGOLD

*Private conservation easements have become a major factor in preservation efforts. With some modifications in their form and use, conservation easements can become an even more powerful vehicle to ensure natural preservation while serving the public interest.*

### 14 Living in Slums: Residential Location Preferences in Santiago, Chile

ISABEL BRAIN, PABLO CELHAY, JOSÉ JOAQUÍN PRIETO,  
AND FRANCISCO SABATINI

*This study offers a new perspective on the location patterns and preferences of slum households. Underlying the family decision to live in a slum is an interest in increasing the probabilities of obtaining social housing more quickly and in a preferred district.*

## DEPARTMENTS

### 1 Report from the President

### 20 Faculty Profile: Petra Todorovich

### 22 New Lincoln Institute Publications:

*Working Across Boundaries: People, Nature, and Regions*  
*The Impact of Large Landowners on Land Markets*  
*Urban Planning Tools for Climate Change Mitigation*  
*Recent Working Papers*

### 27 Program Calendar

### 28 Latin American Research Fellows

### 29 What's New on the Web: *Resources and Tools for Regional Collaboration*

## Climate Change and Urban Development

Accumulating evidence indicates that increasing concentrations of greenhouse gases, primarily carbon dioxide, are raising average temperatures, acidifying and raising the level of oceans, and accelerating natural rates of carbon dioxide emissions. Uncertainties abound, but the carbon dioxide concentration in the earth's atmosphere has risen by 31 percent since 1850 and now exceeds levels experienced over the past 420,000 years. Recent estimates from North America (for 2003) indicate that its anthropogenic carbon dioxide emissions (mainly from burning fossil fuels) were about 1856 million metric tons per year, or about a quarter of all such global emissions.

Urban areas have two important stakes in global climate change. First, urban development can play an important role in mitigation, that is, reducing carbon dioxide emissions directly related to urban activity. And second, urban areas must adapt to the consequences of climate change when those impacts are unavoidable.

What is the contribution of urban areas to emissions? An inventory of North American carbon dioxide emissions [*State of the Carbon Cycle Report*, U.S. Climate Change Science Program, 2008] reports that 31 percent comes from transportation, 42 percent from commercial energy (mainly electricity generation), 12 percent from industry, 11 percent from on-site use of energy in buildings (mainly heating), and the balance from other sources including agricultural production. About 70 percent of the electricity generated is used in buildings (space conditioning, water heating, lighting, refrigeration, electronics, etc.).

In the United States, 37 percent of total carbon dioxide emissions are related to buildings (from electric use in buildings plus on-site energy use), and the emissions are divided about evenly between residential and commercial space. Of the total emissions from transportation, about six-tenths (or 18 percent of all carbon dioxide emissions) come from light vehicles—cars whose use is heavily concentrated in metropolitan areas. Automobile and building emissions, both largely urban phenomena, therefore account for 18 plus 37 or about 55 percent of all carbon dioxide emissions in North America.



**Gregory K. Ingram**

While national policies, such as fuel efficiency standards for vehicles, will be important instruments in reducing emissions, the large shares of building and vehicle emissions mean that local regulations affecting building codes, patterns of urban development, and transport use will be critical emission reducing instruments.

How can cities adapt to and mitigate the consequences of climate change? While coastal cities face specific problems related to rising sea levels, cities generally will confront challenges of changing weather patterns, more extreme events including flooding and drought, water supply shortfalls, and public health issues caused by the geographic spread of diseases. These will require adaptive responses. Some states, such as Washington and California, have already moved to mitigate some of these effects by requiring reductions in greenhouse gas emissions, and there is ongoing discussion of the need to reduce carbon dioxide emissions to 80 percent below 1990 levels by 2050.

Reducing emissions will require supply-side changes—typically shifting away from fossil fuels—as well as reductions in demand that involve improved end-user efficiency and changes in consumer behavior and settlement patterns. In urban areas these changes include more compact development patterns that involve less automobile use and support transit, and more energy-efficient buildings, such as those with common walls.

There is much work and analysis yet to be done on how to proceed, but several tools and techniques already exist that can help local planners and policy makers begin to address these problems. Several of these tools are described in our recent policy focus report, *Urban Planning Tools for Climate Change Mitigation* (see page 24). Another product of the Institute's work on climate change and urban development is the online working paper, "Climate Change and the Resilience of New Orleans: The Adaptation of Deltaic Urban Form," by Armando Carbonell and Douglas J. Meffert. Other related publications will be available on our Web site in 2010. [I](#)

# THE ROLE OF FORESTS IN U.S. CLIMATE POLICY



© The Pacific Forest Trust

**Deforestation in America occurs on 1.5 million acres annually.**

*Laurie A. Wayburn*

**L**ike many schoolchildren, I learned that years ago a squirrel could cross the country from the Atlantic to the Pacific Ocean never touching the ground, using our magnificent forests as an aerial highway. After massive clearing and development for agriculture, cities, and roads, those forests are now a tattered patchwork, and are nonexistent in many places. More than a squirrel's dilemma, though, the loss and altering of America's forests have created both an enormous challenge to climate health and an opportunity for climate policy and action.

More than 30 percent of U.S. forests have been converted to other uses from their pre-European settlement extent, and some 1.5 million acres of U.S. forests continue to be cleared for development annually, more than double annual farmland loss (Smith et al. 2003; USDA 2007). The clearing of America's virgin forests released more than 20 billion metric tons (Pg) of carbon dioxide, totaling over 74 Pg CO<sub>2</sub> since 1850 alone (Houghton 2003). If present trends continue, the United States will lose 75 million acres of forestland over 50 years, emitting another almost 20 Pg CO<sub>2</sub> from deforestation—*not counting* the losses of future forest

sequestration, watersheds essential for drinking water, habitats for species' survival, and other ecological and economic benefits.

Forests play a dual role in global climate change, both sequestering vast quantities of carbon dioxide as they grow (sinks) and releasing it when disturbed by harvest, conversion, or natural phenomena (sources). The global urgency of maintaining and restoring forests as carbon sinks was highlighted as the first recommendation for action in the 1997 Kyoto Protocol (Article 2).

Forest loss and degradation generate 20 percent of current annual CO<sub>2</sub> emissions globally—the second largest source of excess CO<sub>2</sub> emissions after fossil fuels. Historic forest loss adds even more impact—over 40 percent of *all* anthropogenic (human-caused) CO<sub>2</sub> in the atmosphere today (Fisher et al. 2007). While CO<sub>2</sub> emissions from deforestation are immediate, reabsorption (sequestration) takes tens of thousands of years (Denman et al. 2007). Our vast temperate forests contained some of the most productive and largest carbon sinks globally, yet U.S. forest carbon stocks remain far below their historic potential, currently at 10 to 50 percent of their pre-colonial levels (Rhemtulla et al. 2009).

While this forest loss is part of the climate problem, forest conservation is part of the climate

solution. Existing forests continue to play a critical role in combating global climate change as U.S. forests currently sequester more than 13 percent of all domestic emissions annually (US EPA 2009). On this basis alone—not to mention the vast potential of restoring carbon stocks across the landscape—maintaining domestic forests as part of U.S. climate policy is highly significant to the national carbon budget (figure 1).

Indeed, the comprehensive inclusion of domestic forests in national climate policy is essential to achieving the country's goals to stabilize and reduce net emissions of CO<sub>2</sub>. U.S. forests, conserved and managed for resilience to a changing climate, can reduce emissions by up to 1.6 billion tons of CO<sub>2</sub> annually while contributing the majority of projected renewable energy supplies in the next 50 years—at costs equal to or below those for other emissions reductions efforts.

Forests affect many other emissions sectors: energy, manufacturing (e.g., paper and other forest products), construction, landfills, and transportation. Forest woody biomass is used increasingly in energy plants where it is combusted and CO<sub>2</sub> is emitted. Forest products disposed in landfills add to methane emissions, with 67 times the global warming impact of CO<sub>2</sub>.

### Harnessing the Climate Benefits of Forests

Without an understanding of net gains and losses in and from forests, one cannot ensure real and quantifiable climate benefits. Forest sector accounting must be integrated with accounting for other related sectors. Global action on deforestation and forest depletion has been stymied by a lack of legal, economic, scientific, and social infrastructure. However, now that the United States is poised to reenter international negotiations on climate change in Copenhagen for the 2009 meeting of the United Nations Framework Convention on Climate Change (UNFCCC), there is a unique opportunity to set an example.

The United States can restore much of its once vast forest carbon banks by addressing the suite of forest-related climate issues comprehensively, and be a model for global action. California is pioneering this approach under its economy-wide cap on greenhouse gases in the 2006 Global Warming Solutions Act (AB 32).

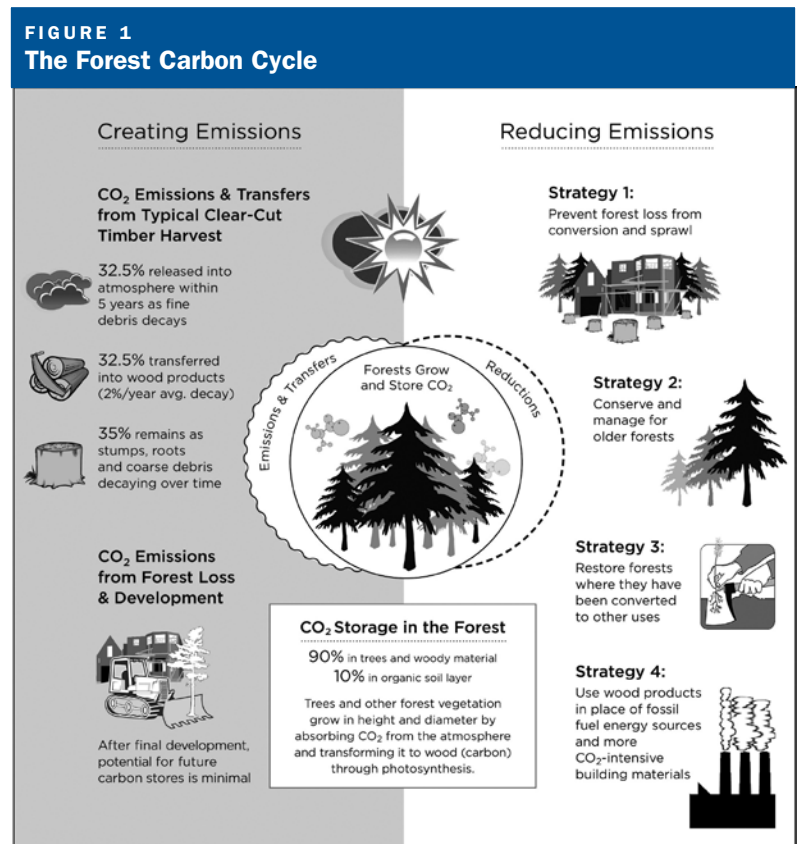
Over the next several decades, emissions reductions from U.S. forests will be particularly valuable

to serve as a counterbalance to increasing emissions from other sectors. Efforts to reduce fossil fuel consumption and emissions will take time as we develop and implement new energy and efficiency-increasing technologies, even as global emissions are rising.

The energy efficiency provisions of the 2009 American Recovery and Reinvestment Plan (HR 1) are projected to cost more than \$23.1 billion to achieve emissions reductions of up to 50 million metric tons of carbon annually—only about 3 percent of that available from forests each year (ICF International 2009). When contrasted with the costs of avoiding deforestation, carbon emissions reductions from forests can be achieved at only a fraction of the cost of emissions reductions from energy efficiency measures. Combined with the global carbon market, it is clear that market forces could be used effectively to maintain and increase net carbon stocks, reversing current trends.

### Key Actions for a National Climate Policy

Four key actions are needed in the forest sector. Some are immediate in their impact, and others are more relevant in the medium and long term.



Source: The Pacific Forest Trust

**Conserving the Forestland Base**

Conserving existing forestland is essential to avoid releasing additional emissions into an overloaded atmosphere, and to provide the necessary base for future sequestration. As with all efforts to reduce CO2 emissions, there is a cost to conservation, but it is well within the ranges of projected costs for other sectors.

The conservation easement is a commonly used legal tool to reduce or prevent development and dedicate land to productive, natural conditions. Assuming an easement cost of \$500 to \$1,000 per acre and using a discount rate of 3 percent, conserving the standing carbon on 75 million acres of forestland would protect more than 5.4 billion tons of carbon at a cost of \$4 to \$8 per ton in 2009 dollars, only 1 percent of the cost of energy efficiency tons funded under HR 1.

Conserving and stewarding large-scale private forests for their net carbon storage offers the co-benefits of preserving vital watersheds and biodiversity. With its significant forest base, the United States could provide substantial emissions reductions to compliance buyers within the global carbon market. In 2008, this market transacted over \$60 billion, and it is expected to grow substantially. This should be a key tool in complementing public investment to prevent and reverse deforestation.

**Increasing the Average Age of Forests**

U.S. forests hold, on average, substantially less carbon stock than they did 150 to 200 years ago. Forest age and carbon stock are highly correlated, with older forests holding and annually accumulating more carbon than younger forests. Restoring older forests will restore carbon stocks.

Changing current forest management to focus on longer harvest intervals would allow forest carbon stocks to increase with forest age. In working forests, this could be achieved by incremental decreases in the percentage of forest growth harvested. This will increase actual yields of timber products as well, by harvesting the growth from a larger base. Of course, time is money in forestry as in all business, and providing the money through the sale of emissions reductions from those older forests is a key role for the carbon market (figure 2).

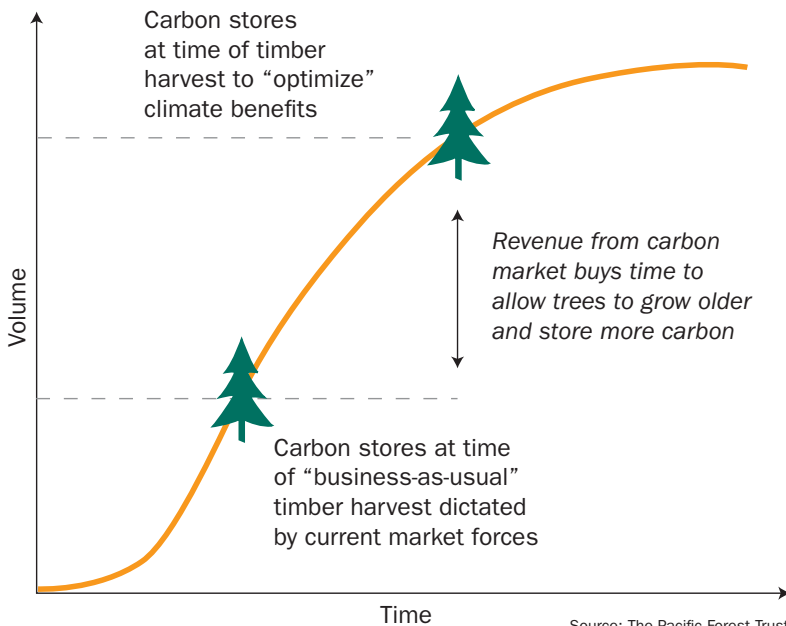
**Replanting Former Forests**

More than 300 million acres of historic forestland have been converted since 1630 (Smith et al. 2003). Reforesting even 20 percent of these former forests, especially along riparian areas of major watersheds such as the Mississippi or Chesapeake, would bring multiple benefits—in addition to tens of millions of tons of carbon sequestration in the next 50 years. Tree planting programs have the potential to contribute up to 50 million additional tons of carbon storage over the next 20 to 30 years (Birdsey, Alig, and Adams 2000). Reforestation can also be used for establishing biomass energy sources through crop switching on low-value agricultural lands for a net increase in average carbon stocks.

**Restoring Forest Resilience and Sustaining Energy**

Restoring natural resilience by promoting the ecological integrity of forests will provide other key benefits as we contend with the effects of global climate change. Perhaps most important, improved forest health means improved watershed health. With the increasing variability of weather patterns and a general drying trend predicted for much of the United States, managing forests to protect healthy watersheds becomes even more vital. Maintaining the ecological integrity of forests through diverse species composition, structurally complex stands, and heterogeneous age-class distributions will promote forests that are more resilient (Millar, Stephenson, and Stephens 2007).

**FIGURE 2**  
**Forest Carbon Stores Over Time**



Typically, such restoration produces low-value wood not economically viable to harvest for many products, but it can be used for biomass energy. Biomass plays a substantial role in the nation's energy supply, contributing 142 billion kilowatt hours. This is 47 percent of renewable energy, and over 3 percent of total U.S. energy consumption. Nearly 87 percent of this biomass was derived from wood in 2003 (Perlack et al. 2005). Biomass is expected to increase to more than 60 percent of all renewable energy consumption over the next two decades, or 13 percent of total consumption (US DOE 2009).

If this biomass is produced in a “closed loop”—wherein the emissions caused by the harvesting and combustion of woody biomass are fully reabsorbed in the next cycle of growth—fewer net CO<sub>2</sub> emissions will result than those created through burning fossil fuels. Conversely, if older forests with their greater carbon stocks are replaced with energy plantations, or demand for other wood products is simply shifted to other forests (creating emissions “leakage”), then a closed loop is unlikely to be achieved.

The stability of forest carbon stocks cannot be separated from ecosystem stability. Managing forests for short-term gains in tons of carbon or biomass alone, without full-cycle accounting or a goal of restoring resilience, will likely lead to greater instability in ecosystems and greater emissions. Conversely, managing for carbon gains within the context of also managing for more stable, robust, resilient ecosystems will achieve more durable results as this carbon is embedded in a dynamic, cyclic, living system.

### Accounting for Forest Carbon Banks

Accounting for forest carbon is relatively simpler than for many other emissions sectors. It is based on three key factors: the amount of forestland; the characteristics of trees on that land; and knowledge of “growth and yield” (growth of trees and their timber product yield). These factors are well documented in the United States and form the basis for the multi-billion dollar forest products industry.

Effective accounting also entails establishing a national baseline for forest climate benefits and integrating actions in the forest sector with those under a national cap-and-trade program. With such a baseline of net forest carbon stocks, we can measure gains and losses. Then individual emissions reductions projects can demonstrate a positive impact for the atmosphere, contributing to net gains not only on a particular property, but for the



© The Pacific Forest Trust

**Changes in forest practices, from clear cutting to more selective harvesting, will result in higher carbon stocks while maintaining sustainable timber supplies.**

nation as a whole. A national baseline strengthens the integrity and credibility of emissions reductions and accounting in forests.

Indeed, the United States has long sought to include forests in its national carbon accounting as part of our international negotiations, as this would greatly strengthen our ability to meet national targets within an international framework. However, because the treatment of carbon accounting in U.S. forests has not been as comprehensive as in other sectors, such as energy or transportation, the global community and international carbon markets have not embraced the inclusion of forests within the U.S. portfolio.

Within this global context, the challenge is to establish a comprehensive and integrated approach

for the forest sector (figure 3). In the energy sector, for example, individual generation facilities are given reduction mandates within an overall sectoral limit. Thus, individual actions meet a clearly defined goal within a sector limit and are part of an overall monitoring system to achieve that goal.

The same can be done for forests with the national baseline as the sector limit, by focusing forest monitoring on the two key areas of carbon loss: conversion and regular harvest. Harvest and growth data are available from federal data on federal lands and from large, private forestland owners that maintain data as part of their regular business. The high concentration of ownership of regularly managed forests makes this a feasible task (36 percent of private forest is owned by less than 1 percent of owners). And, land conversion data are already collected at the county and state level.

**Federal Forest Management**

At the federal level, the Forest Inventory Analysis (FIA) is the best data set. Although designed for purposes other than monitoring carbon, the data can be extrapolated to assess changes in forest carbon stocks. From a climate perspective, management choices on federal lands are essential, since they are large and relatively unfragmented, and are not threatened by conversion or development. These lands currently hold the largest carbon stocks per acre, as well as the greatest potential for increases in both net stocks and the resilience of these stocks. Since these lands are governed through federal

ownership and policy mechanisms, they are well suited for establishing national objectives to address climate change. This could be accomplished through executive order.

Given the significant emerging threats to watershed and habitat due to climate change, these federal forests can serve as cornerstones for landscape-level management strategies to promote forest resilience and sustain these vast carbon banks. Their public trust mandate and positive role as the bulwark of carbon sinks make them an ideal anchor for forest sequestration to meet national commitments.

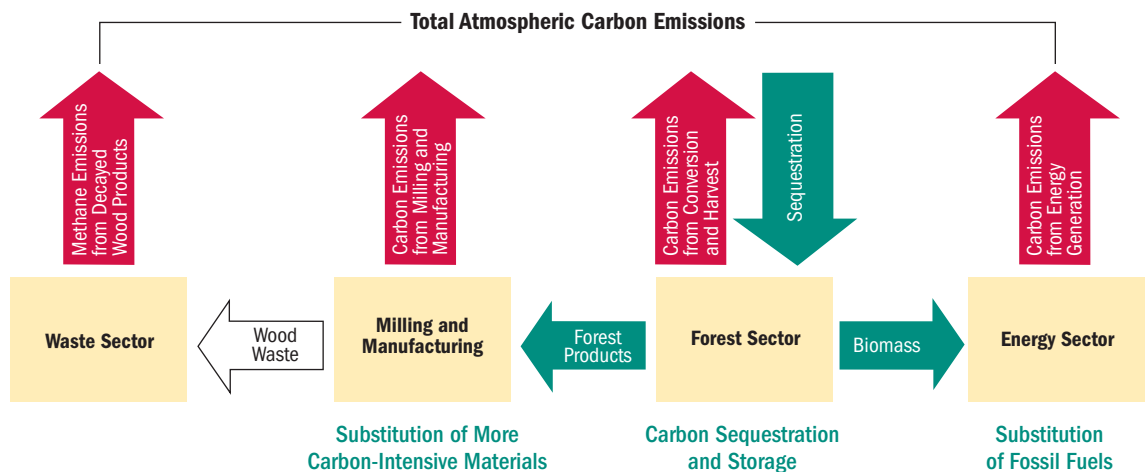
**Private Forest Options**

Privately owned forests face many of the same natural threats to the stability of their carbon stores as federal forests, but they also face threats from market forces: higher competing values from development and agriculture drive deforestation, annual return demands drive depletion.

Critical to the success of private forests in cap and trade is establishing a minimum threshold or baseline from which market forces can effectively raise the net level of carbon through a trading system. This is an effective equivalent to setting a limit for emissions from other sectors, and then using market forces, via trading, to reward those entities that reduce net emissions the greatest amount and at the fastest rate.

Emissions reductions from forests must be equivalent to those in other sectors to be tradable.

**FIGURE 3**  
**Integrating Forest Carbon Tracking with Other Economic Sectors**



Source: The Pacific Forest Trust



The Kyoto Protocol calls for such reductions to be permanent, defined as enduring at least 100 years. However, there are few legal means to require such long-term actions, because the legal construct known as the Law Against Perpetuities normally prohibits contracts of more than 99 years. A conservation easement is an exception that does ensure perpetual legal commitments, and thus makes an ideal market incentive to help ensure that lands remain as forest, reducing risk and providing added assurances and market credibility.

Conservation easements regularly allow forest management in protected working forests. This enables key management goals to be met for climate and other conservation purposes, such as adaptation, thus reinforcing both the underlying legal durability and natural durability of emissions reductions. In compliance systems developing at the state level, e.g., California and the New England states of the Regional Greenhouse Gas Initiative (RGGI), markets have demonstrated a marked preference for the additional rigor, quality, and permanence of forest emissions reductions from lands protected by conservation easements.

Conservation easements on working forests are typically valued at 40 to 50 percent of fee title, adding substantially to the revenues from timber harvesting and emissions reductions. Sales of emissions reductions in California's pre-compliance carbon markets increase net present value by an estimated \$2,000 per acre. Adding the value of easements used to anchor these lands creates three income streams for landowners, increasing competitiveness relative to conversion pressures.

## Conclusion


Conservation and restoration of higher levels of carbon stocks in U.S. forests are key components of any comprehensive approach to achieving the contemplated goals of climate policy. Sustaining these vast and vital lands will both restore the squirrels' highway and directly reduce threats leading to forest loss and depletion. Ensuring the health of forests and their carbon stocks depends on the resilience of forest ecosystems. Restoring resilient forest carbon stocks will also protect and restore watersheds, provide for wildlife and fisheries habitat, and contribute to the nation's renewable energy supply. Linked but separate policies for federal and private forestlands allow for the most effective strategies to be used for each. Conservation ease-

## ABOUT THE AUTHOR

**LAURIE A. WAYBURN** is cofounder and president of the Pacific Forest Trust, which is based in San Francisco, California. She was the Kingsbury Browne Fellow at the Lincoln Institute in 2009–2010. Her fellowship working paper on which this article is based, *Forests in United States Climate Policy: A Comprehensive Approach*, is available on the Web site ([www.lincolninst.edu](http://www.lincolninst.edu)). Contact: [lwayburn@pacificforest.org](mailto:lwayburn@pacificforest.org)

## REFERENCES

- Birdsey, R., R. Alig, and D. Adams. 2000. Mitigation activities in the forest sector to reduce emissions and enhance sinks of greenhouse gases. In *The impact of climate change on America's forests: A technical document supporting the 2000 USDA Forest Service RPA Assessment*. eds. L.A. Joyce and R. Birdsey. RMRS-GTR-59, USDA Forest Service.
- Denman, K.L. et al. 2007. Observations: Surface and atmospheric climate change. In *Climate change 2007: The physical science basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. eds. S. Solomon et al. Cambridge, UK: Cambridge University Press.
- Fisher, B.S. et al. 2007. Issues related to mitigation in the long-term context. In *Climate change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. eds. B. Metz et al. Cambridge, UK: Cambridge University Press.
- Houghton, R.A. 2003. Revised estimates of the annual net flux of carbon to the atmosphere from changes in land use and land management 1850–2000. *Tellus*. 55B:378–390. <http://cdiac.ornl.gov>
- ICF International. 2009. *Summary report: Climate impact of the economic stimulus package: Preliminary report prepared for Greenpeace USA*. <http://www.greenpeace.org/usa/press-center/reports4>
- Millar, C.I., N.L. Stephenson, and S.L. Stephens. 2007. Climate change and forests of the future: Managing in the face of uncertainty. *Ecological Applications* 17(8):2145–2151.
- Perlack, R.D. et al. 2005. *Biomass as feedstock for a bioenergy and bioproducts industry: The technical feasibility of a billion-ton annual supply*. Washington, DC: U.S. Department of Energy DOE/GO-102005-2135.
- Rhemtulla, J.M., D.J. Mladenoff, and M.K. Clayton. 2009. Historical forest baselines reveal potential for continued carbon sequestration. *Proceedings of the National Academy of Sciences* 106(15): 6082–6087.
- Smith, B.W. et al. 2003. *Forest resources of the United States, 2002: A technical document supporting the USDA Forest Service 2005 update of the RPA assessment*. GTR-NC-241. St. Paul, MN: USDA, Forest Service.
- U.S. Department of Agriculture, Forest Service. 2007. *Interim update of the 2000 Renewable Resources Planning Act Assessment*. Washington, DC: USDA FS-874.
- U.S. Department of Energy. 2009. *Impacts of a 25-percent renewable electricity standard as proposed in the American Clean Energy and Security Act discussion draft*. Washington, DC: Energy Information Administration, Office of Integrated Analysis and Forecasting. SR/OIAF/2009-04.
- U.S. Environmental Protection Agency. 2009. *Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2007*. Washington, DC: EPA 430-R-09-004.

ments are a key tool for land use and climate planning on private lands, providing significant incentives for landowners to participate in national efforts to increase the climate benefits of forests. 

# Private Conservation Easements:



© Windham Land Trust

**Part of the stream to Lake Suzanne in the Windham Land Trust property.**

*Gerald Korngold*

Over the past 25 years, there has been a dramatic increase in the acquisition of conservation easements by nonprofit organizations. Privately held conservation easements, i.e., those held by nonprofits rather than governmental entities, have thus emerged as an important and growing tool for the preservation of natural and scenic features of the United States landscape.

Conservation easements bring many benefits, as nonprofits use market forces rather than government coercion to achieve environmental goals. Conservation easement acquisitions by nonprofits also bring efficiencies, are cost-effective, and repre-

sent the free choice of the landowners. This legal tool has yielded increased, and arguably more effective, conservation efforts in recent decades, and the laws that permit and regulate conservation easements should continue to protect and validate such interests.

At the same time, though, private conservation easements raise some public policy concerns related to the tax subsidies; the absence of public process in their creation; long-term stewardship; and flexibility to adapt conserved land to emerging needs of the community. This article examines the recent achievements and benefits of conservation easements, and suggests some reforms that might make them an even stronger vehicle for land conservation in the public interest.

# A RECORD OF ACHIEVEMENTS AND THE CHALLENGES AHEAD

## Defining Conservation Easements

A conservation easement is a restriction on land that prevents the owner of the burdened property from altering the natural, ecological, open, or scenic attributes of the property. (In some states or localities, this tool is termed a “conservation restriction,” “conservation right,” or “conservation servitude.”) Conservation easements that protect scenic views and natural features—the most common type of easement—do not necessarily give the public access to the property. Rather, the public receives benefits through the support of wildlife habitat or visual access from outside the property.

Conservation easements typically last in perpetuity, often reflecting the desire of donors to preserve the land forever. The Internal Revenue Code encourages this practice by permitting income tax deductions for donations only if the conservation easement is perpetual in nature. The perpetuity aspect is both the great strength and potential weakness of a conservation easement. The unlimited duration ensures that the property’s natural feature will be preserved for future generations. Governmental regulations cannot ensure perpetuity, since they can be amended by local officials or politicians who are subject to various pressures over time.

On the other hand, perpetuity may present a problem since it freezes the land’s use. The environmental importance of a piece of land may decrease or disappear due to subsequent changes in the ecology and climate. Moreover, the local community may have a great need to use a parcel under conservation easement for affordable housing, a hospital or school, or even economic development. The perpetual restriction of a conservation easement may prevent changes in land use necessary to meet the then current social, environmental, and economic needs of future generations.

William H. Whyte (1959) popularized, if not invented, the term “conservation easement” when he advocated their use, despite various legal impediments. Most important, the common law only permitted restrictions to exist between neighboring parcels and did not allow an organization to hold a restriction over land if it did not own nearby prop-

erty (i.e., the prohibition of “in gross” restrictions). To permit nonprofits to hold conservation easements in gross, statutory validation was necessary. Thus, over the past 30 years, all states have passed laws allowing private conservation easements.

## U.S. and International Experiences

There is limited data on the number and acreage of private conservation easements, as there is no universal reporting requirement in the United States. However, the fragmentary data that can be teased out show significant numbers and tremendous percentage of growth. In 2005, the Land Trust Alliance reported that local and state land trusts held easements on more than 6.2 million acres, showing a 148 percent increase from the 2000 figure of 2.5 million (table 1). The Nature Conservancy Web site indicates that it currently holds 3.2 million acres under conservation easements. These two figures exceed 9 million acres, and do not include the many conservation easements held by other nonprofits. This acreage is roughly equivalent to the combined land area of Rhode Island, Delaware, Connecticut, and Hawaii.

**TABLE 1**  
**Conservation Easement Acreage Held by Land Trusts in Sample States, 2005**

State	Total Conservation Easement Acreage	Total Land Acreage Within State	Percentage of State Land Under Conservation Easement
Maine	1,492,279	22,646,400	6.58
Vermont	399,861	6,152,960	6.49
Maryland	191,330	7,940,480	2.40
New Hampshire	133,836	5,984,000	2.23
Virginia	365,335	27,375,360	1.33
Colorado	849,825	66,620,160	1.27
Massachusetts	61,569	6,755,200	0.91
New York	191,095	34,915,840	0.54
Arizona	35,645	72,958,720	0.04
Iowa	6,000	36,014,080	0.01

Source: Land Trust Alliance (2005, chart 5); U.S. Census Bureau (2006, table E-1, using a factor of 640 acres per square mile to convert area figures).



© Windham Land Trust

**Old woods trail in the Windham Land Trust property.**

Conservation easements are no longer an exclusively American phenomenon, as a number of other countries have begun using them. Most of these countries follow the “common law” system of jurisprudence, so it was possible for them to expand the law of easements and restrictions by statute to accommodate conservation easements by permitting “in gross” ownership, similar to what occurs in the United States.

Common law countries now permitting conservation easements to some extent include various Canadian provinces (e.g., Ontario, British Columbia, New Brunswick, Alberta), various Australian states (e.g., New South Wales, Victoria, Queensland, Western Australia), New Zealand, Ghana, Kenya, Uganda, and Tanzania. Extending the conservation easement vehicle to countries following “civil law” systems is harder to accomplish, as even the concept of “in gross” ownership is foreign and specifically barred by governing codes. Still, some conservation easement-type legislation has been passed with local modifications in Mexico and Costa Rica, and legislation is proposed in Chile.

**A Recent Legal Decision**

A case decided by the Supreme Judicial Court of Maine in March 2009, *Windham Land Trust v. Jeffords* (967 A.2d 690), demonstrates how judicial validation of conservation easements may well lead to their increased use. In that case, prior owners of a 100 acre parcel donated a conservation easement on 85 acres to the Windham Land Trust

(the Trust). No restriction was placed on the remaining 15 acres, on which there were farm buildings and a residence. The conservation easement stated that its purpose was to preserve the property and limited the owners’ use to “residential recreational purposes.”

The defendants, the current owners of the 100 acres, agreed to be bound by the easement when they purchased the property. They later sought to bring paying guests on to the restricted land for wagon rides, horse-drawn sleigh rides, hiking, snowshoeing, and Nordic skiing on the logging roads; and for fishing and ice skating on the pond. They claimed such commercial activity was necessary to generate income for maintenance of the roads and pond.

After attempting unsuccessfully to get the defendants to mediate the issue, the Trust brought an action against the them, claiming that their use of the property for commercial purposes violated the conservation easement. The State Attorney General, pursuant to statutory power, intervened in the lawsuit to seek enforcement. The Supreme Judicial Court had to determine whether the restriction to “residential recreational purposes” included the uses proposed by the defendants.

The court could have interpreted the language in a manner that favored either the Trust or the defendants. It chose the former, finding that “residential recreational purposes” referred to recreational activities associated with the residents living on the 15 unrestricted acres, and did not encompass the income-producing uses by outsiders. In doing so, the court chose to reject the defendant’s view that “residential” merely referred to uses generally ancillary to residential uses, not to this 15 acre parcel. The court also rejected the defendants’ evidence that the deed occasionally referred to “recreational use” without the residential modifier.

Such is the business of judging, where courts choose between competing views. But what is noteworthy is that in supporting the Trust’s position, the court did not follow traditional constructional maxims in reaching a result that was favorable to the protection of the easement.

Longstanding legal precedent holds that when interpreting land restrictions, doubts should be resolved in favor of permitting freer use of the land rather than greater limitations on the owner’s use. The court could have relied on this concept to find that the ambiguity in the conservation ease-

ment permitted the proposed commercial uses. But the court instead protected the conservation easement to the fullest. Moreover, the court chose to rely on the “plain meaning” of the deed to reach its finding, eschewing evidence that other courts might have used—i.e., the definition of “residential” as used elsewhere in the law and evidence surrounding the transaction.

The significance of the *Windham Land Trust* decision lies in its strong support for conservation easements and the willingness of at least this court to enforce these interests to the fullest. To the extent that this case is a harbinger of future decisions, it is an important milestone in the recognition and validation of conservation easements.

## Benefits and Costs

### *The Acquisition Stage*

Many of the benefits of conservation easements are apparent in the acquisition stage. Easements serve the growing value of land preservation in the United States, where property is now prized for its natural and historical features and no longer solely for its development potential. Moreover, private conservation easements are nongovernmental programs, so direct acquisition costs are not borne by cash-strapped local, state, or federal governments.

The purchase of conservation easements allows for efficient land conservation arrangements, as organizations can achieve preservation goals without having to acquire a fee interest. Not surprisingly, the growth of easement acquisition has been accelerating as compared to outright acquisition of the full fee interest in conservation land. Finally, easements are consensual transactions and avoid bitter, divisive battles of coercive conservation methods such as governmental regulation.

Still, there are various concerns about the creation of conservation easements. There is a significant federal tax subsidy, since section 170(h) of the Internal Revenue Code gives an income tax deduction to the donor of a perpetual conservation easement. In the 2003 tax year, the deductions for conservation and historic easements totaled \$1.49 billion. Moreover, the average amount of a conservation easement donation was three times higher than the average amount of the next highest type of donation, supporting the inference that conservation easements provide tax benefits primarily to higher income individuals (table 2). Additionally, local and state property tax revenues are reduced

by the placement of an easement on a property. This forces the municipality either to cut services or to increase the tax burden on other citizens to maintain revenue levels.

It is also fair to ask whether all conservation easements advance conservation goals, and whether all are consistent with a public land use process. Nonprofits may accept a donation of any conservation easement, often initiated by a taxpayer seeking a deduction, even though the easement does not serve a real preservation goal. National organizations have recommended “best practices” for acquisition, and while these are helpful they are not binding. Additionally, nonprofits do not necessarily acquire conservation easements pursuant to a public land use plan. So, conservation easements may not be part of a coordinated, community-wide preservation program.

Moreover, nonprofits are not subject to the democratic, political process, and may not be responsive to the local citizenry. This could lead to conflicts, especially between distant nonprofits owning conservation easements and the local community. Even William H. Whyte (1959, 37) warned of the “muted class and economic conflicts” inherent in conservation easements.

Given the benefits of conservation easements, there are some possible adjustments to the acquisition phase that could make them even stronger vehicles for conservation in the public interest.

- Reform the Internal Revenue Code subsidy to permit a deduction for an open space or habitat

**TABLE 2**  
**Types of Individual Noncash Charitable Contributions, 2003**

Type of Contribution	Average Amount Per Donation
Easements	\$619,727
Real estate	\$201,112
Other investments	\$158,903
Mutual funds	\$43,889
Corporate stock	\$34,279
Art and collectibles	\$6,282
Clothing	\$878
Household items	\$808
<b>Average amount, all donations (including those not shown)</b>	<b>\$2,585</b>

Note: Not all types of noncash charitable contributions are shown.

Source: Wilson and Strudler (2006, figure A).

easement only if there is prior local, state, or federal governmental certification that the easement provides a significant public conservation benefit. This would help to ensure that public funds spent via deductions are used only for important, comprehensive, environmental goals. Donors would have an incentive to engage with the public land use process, bringing the advantage of planning, coordination, and leverage.

This recommendation would make donations of open space and habitat easements consistent with the requirements for deductions of historic easements, which need governmental approval of the site for deductibility (*Internal Revenue Code* § 170(h)(4)(A)(iv)). Transaction costs may increase, but states such as Massachusetts that already require governmental approval for private conservation restrictions still have managed to create a high number of such interests.

- Parties could still freely donate conservation easements that do not qualify under the revised guidelines, but the public would no longer subsidize these gifts. Owners would still be able to do what they want with their property.
- Because of a dearth of data on conservation easements, states should require counties to maintain separate records listing conservation easements, along with their other land records.

### ***The Operational Stage***

Effective stewardship of conservation easements requires periodic inspections and monitoring of the burdened property, discussions with the landowner over present and potential violations, and enforcement actions. Meaningful stewardship is essential to ensure the continued value of the easement to the public and to oversee the tax subsidy.

There are certain benefits to nonprofit ownership during the operational stage. The nonprofit, not government, bears the cost of stewardship, and an adequately resourced, committed nonprofit can do an especially fine job in this endeavor. Nonprofits are less subject to political interest group pressures and can raise (or initially require from donors) necessary monitoring funds.

There are some concerns, though. Inadequately funded and weakly governed nonprofits often lack the fiscal and organizational capital to sufficiently monitor the easements. Although many organizations perform well, there are reports of failures

by nonprofits to monitor, enforce, or even know about the easements they own. Various steps can be taken to increase the operational effectiveness of privately held conservation easements.

- Increased educational programs and compilations of best practices, such as those offered by the Land Trust Alliance, may provide guidance to nonprofits seeking to enhance their stewardship. It remains to be seen, however, whether low-functioning organizations will bother to take advantage of these offerings.
- The attorneys general in the states can increase their activity in bringing actions to enforce conservation easements when the nonprofits owning them fail to do so. The attorney general has the power to do so pursuant to the authority to represent the public's interest in matters of charitable trusts, gifts, and organizations. The problem is limited resources, especially at a time when we see state attorneys general laying off employees. One possibility is to require a one-time fee when conservation easements are recorded, to be devoted exclusively to attorney general enforcement.

### ***The Perpetuity Issue***

Conservation easements are fixed, perpetual property rights that bring important protection to threatened environmental areas. But over time there will inevitably be advances and emerging challenges in economic and social circumstances, technology, the political fabric, and the environment. In the face of inexorable change, the lack of flexibility in perpetual easements may create a problem for future generations. This is not likely to occur often. One would expect the vast majority of conservation easements to be enforced as written. But in some rare instances, a new development may call for the modification or even termination of a conservation easement in order to serve the public interest.

Flexibility can be increased to provide for these rare situations by various means.

- While nonprofits boards have the power to amend conservation easements, trustees/directors often hesitate to modify easements out of a concern that they are breaching a fiduciary duty. Nonprofit law needs to be clarified to provide that the duty of care, loyalty, and obedience to the overall mission is not violated by compromises on one specific easement.

- Judges can be more aggressive in applying traditional legal doctrines that could bring needed flexibility in those rare situations where the public interest requires changes.
- Finally, government can employ the doctrine of eminent domain to “take” conservation easements that prevent development in the public interest. The nonprofit holder can use the compensation it receives to preserve other land.

One case decided in 2008 reached mixed results on the flexibility issue. In *Bjork v. Draper*, the Appellate Court of Illinois dealt with a conservation easement that had been granted to the Lake Forest Open Lands Association (886 N.E.2d 563). The easement granted to the Association by a former owner was intended to retain the property in perpetuity as scenic and open space, and prohibited the placement or construction of any structures of any kind. Subsequent owners (the Drapers) sought to add a brick driveway turnaround to the lot and to replace some plantings.

The Association, after discussions with the Drapers, approved of this change and executed an amendment to the conservation easement. The Association consented since the Drapers agreed to provide substitute land under the conservation easement for the turnaround area, so that the conservation purpose could continue to be achieved. Under the Illinois conservation easement statute, any owner of property within 500 feet of the property under a restriction can sue to enforce it. (Ill. Stat., ch. 765, sec. 120.4). The Bjorks, owners of a neighboring lot, sued to challenge the validity of the amendment.

The correct decision would have been for the court to uphold the amendments since they reflected the agreement of the true parties in interest—the nonprofit owning the easement and the burdened landowner. It is necessary to provide for flexibility in conservation easements to accommodate legitimate owner requests, especially when the preservation goals will not be compromised. *Bjork* seemed to be such a case. If there is no ability to reach modification agreements, owners will hesitate to enter into conservation easements, and the overall preservation effort will be frustrated.

However, the *Bjork* court was only partially right. The court appropriately held that there was a power to amend despite the easement being granted in “perpetuity.” But, the court erred when

it held that since the original language of the easement barred any structure, an amendment could not alter that original provision and permit the turnaround. This makes no sense: since when can the parties not amend “any and every” term in an agreement?

The real culprit here is the Illinois statute that allows neighbors a right of enforcement. This statute was probably enacted for a good reason—to ensure that someone can enforce a conservation easement if the nonprofit fails to do so. But, as illustrated by *Bjork*, the right of neighbor enforcement frustrates the compromise and flexibility necessary to accommodate evolving circumstances and injects numerous, meddlesome free riders into the equation.

### Conclusion

Private conservation easements have become a major factor in preservation efforts. There are many benefits to these effective, nongovernmental tools for safeguarding the environment. Conservation easements have permitted the leverage of private initiative, resources, and commitment to ensure that open space and wildlife habitats are preserved for future generations. They have made a positive impact on the landscape of today and tomorrow. With some modifications in their form and use, conservation easements can become an even more powerful vehicle to ensure natural preservation while serving the public interest. **L**

### ▶ ABOUT THE AUTHOR

**GERALD KORNGOLD** is professor of law at New York Law School and a visiting fellow in the Department of Valuation and Taxation of the Lincoln Institute of Land Policy in 2009–2010. He researches property rights, conservation easements, and global land issues. Contact: [Gerald.Korngold@nyls.edu](mailto:Gerald.Korngold@nyls.edu)

### ▶ REFERENCES

Land Trust Alliance. 2005. National land trust census report. [www.lta.org/census](http://www.lta.org/census)

U.S. Census Bureau. 2006. State and metropolitan data book. Table E-1, State ranking—area and population. [www.census.gov/compendia/smadb/](http://www.census.gov/compendia/smadb/)

Whyte, William H., Jr. 1959. *Securing open space for urban America: Conservation easements. Technical Bulletin*. Washington, DC: Urban Land Institute.

Wilson, Janette, and Michael and Strudler. 2006. Individual noncash charitable contributions, 2003. *Internal Revenue Service, SOI Bulletin* (Spring). [www.irs.gov/pub/irs-soi/03incart.pdf](http://www.irs.gov/pub/irs-soi/03incart.pdf)

# LIVING IN SLUMS

## Residential Location Preferences in Santiago, Chile



**Downtown  
Santiago**

© Martin O. Smolka

*Isabel Brain, Pablo Celhay, José Joaquín Prieto,  
and Francisco Sabatini*

In Latin American cities, especially in the larger ones, location is critical for vulnerable groups. In Buenos Aires, the population of shantytowns in the central area doubled in the last inter-census period (1991–2001), even though total population declined by approximately 8 percent. In Rio de Janeiro during the same decade, the fastest growing informal settlements were those considered to be in the best locations, generally near the beach in middle- and upper-income neighborhoods, although they were already the most crowded and congested slums.

This trend can also be observed in Chile, although the problem of informal settlements is much smaller than in the rest of Latin America.

Only about 28,600 families (1 percent of the total population of Chile) live in 533 identified slums. Successive cadastres show that even as old slums are redeveloped, new slums continue to be created. More than half of the existing slums were established between 1991 and 2007 (Fundación un Techo para Chile 2007).

There are several explanations for the persistence of slum, even in Chile where housing policy has been considered more comprehensive than in other countries, and where little urban land remains open to invasion. Some families that live in slums may represent a residual group in transition between their arrival in the city and their relocation to social housing or other formal housing. Others may prefer having their own home in an informal settlement to sharing quarters with another family or relatives in a more formal setting.



Living in slums also may be comparable to joining a waiting list to gain access to the social housing program, since the government program focused on these families (Chile Barrio) has been modified to meet their needs and expand access to social housing. Since some slum families still do not meet the conditions required to participate in the social housing program, they remain until other options arise.

On the other hand, the continued existence of slums cannot be attributed to high poverty levels or a weak policy of settlement regularization. On the contrary, in the past 20 years poverty in Chile was reduced by half, and is now estimated at 13.7 percent of the population (CASEN 2006). At the same time the government implemented a housing policy that provides vouchers for families to purchase a house. This program has been supported by successive government administrations, benefiting two million families thus far, at an average rate of 100,000 families per year, or almost 3 percent of the 3.6 million urban households in Chile in 2002.

Notwithstanding its success in terms of coverage, the program has led to a concentration of social housing on the periphery of Santiago and other major cities. Historically, social housing developments created large, socially homogenous zones that led to the segregation of low-income families, with negative consequences. Some such zones now face serious social problems such as high unemployment and school drop-out rates, as well as widespread feelings of hopelessness and reversal of social values among residents (Sabatini, Cáceres, and Cerda 2004).

There is also more instability and job insecurity in the Chilean economy today than in the past, and a radical transformation of the political system has disrupted the day-to-day relationships between popular classes and political party leaders. As these traditional forms of social cohesion weaken, questions such as where one's home is located within the city become more relevant, insofar as location might provide access to a better "geography of opportunities"—places perceived as having more and better public and private services, such as school, markets, parks, and transportation facilities, as well as access to better jobs and proximity to social networks and relatives.

In this context, we examine some of the factors influencing the continued development and persis-

tence of slums, notwithstanding the availability of massive government housing programs and large-scale titling programs, as well as a legal system that protects property rights.

### **A Survey of Housing Location Preferences**

Using data from the Metropolitan Region of Santiago, we designed three sample sets totaling 1,588 households: households living in slums (812); households living in social housing that moved from slums that were eradicated (510); and households living in social housing that did not move from a slum (266). The three samples were drawn, respectively, from an inventory of slum dwellers prepared in 2007; the registry of the Chile Barrio program listing former slum households that acquired social housing from 1999 through 2005; and families in the same social housing developments who did not transfer from a slum. The surveys in the slums were conducted door-to-door in August 2008 and those in the social housing neighborhoods in December 2008.

The survey findings show that living in slums allows families to optimize housing location preferences with a greater probability of success, as defined mainly by proximity to a good geography of opportunities. Nearly 70 percent of the households that formerly lived in slums and now live in social

**Centrally located social housing**



© Martin O. Smolka

**TABLE 1**  
Origin of the Sample Households in the Metropolitan Region (RM) of Santiago (percentages)

Origin	Slum Households	Social Housing Households	
		From a Slum	From Elsewhere
From the same district in the RM	60.7	69.5	51.7
From another district in the RM	33.0	28.1	45.6
From another region	6.3	2.4	2.7

**TABLE 2**  
Current Land Value Compared to the Value in the District of Origin

Current Land Value	Slum Households		Social Housing Households			
			From a Slum		From Elsewhere	
	#	%	#	%	#	%
Higher or equivalent land value	192	73.1	100	71.4	74	61.4
Lower land value	71	26.9	40	28.6	46	38.6
<b>Total</b>	<b>263</b>	<b>100.0</b>	<b>140</b>	<b>100.0</b>	<b>120</b>	<b>100.0</b>

housing stayed in the same district, compared to 51.7 percent of families in social housing that did not come from slums (table 1). Thus, without radically altering their housing location, former slum families gained access to a housing voucher that enabled them to acquire better standards of living and obtain the legal title.

Households in slums also perceive that they have higher priority over other similar households in gaining access to social housing, and they are more likely to access social housing in their preferred location. Some 63 percent of households currently living in slums reported that they had an advantage in accessing social housing, compared to other families. This perception coincides with reality, since between 1996 and 2007 the number of slums in Chile declined from 972 (105,888 households) to 533 (about 28,600 households) and the housing deficit associated with slums was reduced by 75 percent.

To examine the price of land as a factor in housing choice, we used the appraised fiscal values in zones of similar characteristics (ZCS) and, as reference, the highest value obtained for each district. In this analysis, 71.4 percent of the families that moved from a slum to social housing transferred to a better or equivalent location (table 2).

The survey also shows that the majority of the slum families (60.6 percent) arrived at the slum between 2000 and 2008—a period of great expansion in the supply of housing for lower-income

**TABLE 3**  
Year of Arrival for the Sample Households Living in Slums

Year of Arrival	Number of Households	Percent of Households
2000–2008	463	60.6
1990–1999	202	23.1
Prior to 1990	147	16.2
<b>Total</b>	<b>812</b>	<b>100.0</b>

families—indicating a preference for that slum location over social housing elsewhere (table 3).

The survey results must be interpreted taking into account the following contextual factors.

- The group of families originating from slums is small compared to the population that potentially can benefit from the housing voucher program. Former slum families comprised only 2.2 percent of all households living in social housing in 2001 (INVI 2001).
- The process of segregation of the poorest families on the urban periphery has been a steady trend over the past 30 years. In the 1980s, a policy of massive eradication of slums was put in place, and families were relocated from downtown districts to the periphery. In the 1990s, as the country moved towards democracy, the new administration adopted a policy of large-scale social housing construction aimed to prevent the formation of new slums. However,

much of the new social housing is being built even farther into the periphery, resulting in residential segregation on a regional scale.

- As a result of these policies, large sectors of the metropolitan region are characterized by social homogeneity. For example, the outlying district of La Pintana grew 2.5 times between 1985 and 1994 (from 80,000 to 190,000 inhabitants) due to the relocation of lower-income families that used to live in districts now inhabited by high- and upper-middle income families in Greater Santiago (Las Condes, Providencia, Ñuñoa, La Reina, among others).
- Notwithstanding the prevailing trend and contrary to what happened in earlier decades, the families now living in slums seem to have an advantage over families that did not come from slums in obtaining a housing voucher that meets their location preferences.

### Interactions between Poverty and Land Values

Half of the slum households (51 percent) are not poor, as measured by the official household survey of socioeconomic characteristics (*La Encuesta de Caracterización Socioeconómica—CASEN*). In our sample, most slum households have a higher share of male-headed households, smaller household size, and a per capita income that is almost twice that of most low-income families in the Metropolitan Region. Thus, the conventional belief that the poorest families live in the slums is not upheld. What seems to be happening is the expression of a strategy by lower-income families to overcome their vulnerability and make the most of the

© Martin O. Smolka



opportunities to improve their situation by using housing location as an asset in the process of social mobility.

The incidence of poverty in slums varies depending on the average land price of the district where the slum is located. Less than half the families living in slums located in low and high land value districts are poor, while those in districts of mid-range land values have much higher poverty levels (table 4). The households living in districts of low and high land values also have a higher proportion of workers in the private and domestic services sectors, and fewer self-employed.

Residents perceive the objective location of the slums as better than that of social housing

### New social housing on the periphery of Santiago

**TABLE 4**  
**Poverty and Employment among Slum Households by District Land Value**

Variables	Land Value (percentages)			
	Low	Medium-Low	Medium-High	High
Percent poor	41.4	56.1	66.4	36.8
Employed	57.8	53.5	53.7	63.5
Permanent occupation	68.5	73.2	72.8	85.4
No work contract	34.6	35.3	35.6	21.7
Self-employed	14.0	25/6	34.2	17.7
Employee/worker in private sector	72.8	66.7	56.3	68.4
Domestic servant (non-resident)	9.4	4.4	5.9	10.1
Adjusted household capita income per year (2006 in US\$)	\$1,401	\$1,113	\$918	\$1,519

**TABLE 5**  
**Distribution of Households by Land Value in their Respective District (percentages)**

Land Value	Slums Households	Social Housing Households
Low	21.8	16.0
Medium-low	27.0	46.8
Medium-high	24.3	29.4
High	27.0	7.9
Total	100.0	100.0

because slums are more likely than social housing to be found in higher land value districts: 27 percent compared to 7.9 percent (table 5). At the same time, slum households have a much better perception of their proximity to services and work, and they find their district more socially diverse than households that live in social housing (table 6).

If land values are used as an indicator of access to services, it is clear how significant location is for families. The slums located in districts where land values are high show significant advantages over

those in low land price districts, especially with regard to the job location of the head of household and the spouse (table 7).

**Declared Location Preferences**

The households that live in slums value their location. When asked the question, “If you had the opportunity to change to another house, what would you choose?” 28.8 percent declared that they would prefer to stay in the same place, and 57.6 percent would move to another location in the same district. The third option, move to another district, was selected by only 13.6 percent of the households.

Regarding their future expectations, most slum households indicate that they expect to be living in social housing five years hence. Sixty-seven percent believe they will be in social housing in the same district, and 25 percent of that group believe they will be living in social housing built at the slum where they live now.

The most interesting finding is that 51.8 percent of the slum households state that they prefer to stay in the slum (under the same conditions)

**TABLE 6**  
**Perceptions of Housing Location**

Perceived to be close to	Slums Households		Social Housing Households		T-test*
	Mean	#	Mean	#	
School or kindergarten	73.3	576	73.3	505	-0.01
Supermarket or shopping center most visited	66.2	796	56.2	755	<b>3.41</b>
Public transportation	83.3	810	86.4	774	-1.51
Family most frequently visited	72.7	712	66.1	676	<b>2.25</b>
Job of head of household	59.7	599	45.0	549	<b>4.17</b>
Job of spouse/partner	68.1	308	51.5	265	<b>3.35</b>

\* Significant differences between the groups in bold.

**TABLE 7**  
**Perceptions of Location by District Land Values among Slum Households (percentages)**

Perceived to be close to	Land Values			
	Low	Medium-Low	Medium-High	High
School or kindergarten	66.6	66.9	75.8	76.9
Supermarket or shopping center most visited	49.4	56.7	68.4	81.2
Public transportation	88.9	71.3	88.7	88.3
Family most frequently visited	73.5	67.9	67.1	77.3
Job of head of household	45.8	58.5	53.5	67.5
Job of spouse/partner	51.5	61.4	59.3	72.9

rather than move to social housing far from their current district. This preference is also expressed by 58.7 percent of households that declared their willingness to save more than the approximately US\$400 that the state currently requires as payment for participating in the program; a higher payment would increase the chances of staying in the same location even more.

## Conclusion

This study offers a new perspective on the location patterns and preferences of slum households. Underlying the family decision to live in an informal settlement is an interest in increasing the probabilities of obtaining social housing in a shorter period and in the preferred district. There seems to be no trade-off between getting a better location and giving up on a residential voucher for formal housing. Rather, living in a slum is the rational strategy to reach both objectives.

Households following this strategy have a somewhat different profile than the typical poor family in Santiago. Most are headed by a male and have an income that, although low, is significantly above the poverty line as defined in Chile. The location of the slum seems to play an important role in favoring the proximity to work, for both the head of household and the spouse.

The Chilean housing voucher program was originally guided by the notion of the housing deficit, in which families were treated as a number on a list to obtain a voucher on an independent basis, without considering aspects such as maintaining social networks or location preferences. Its objective was to provide residential solutions for slum families. That policy, based on subsidizing demand and taking the land market as given, led to large-scale segregation in the periphery where land prices tend to be lower.

This study shows that families will opt for a better location, often within the central city, even if it means living in a slum or on a smaller lot, thus demonstrating the limits of social housing based on lower land prices on the periphery. The Chile Barrio program, created in 1996, has shifted the emphasis from the housing deficit to a territorial focus that makes the slum the unit of intervention, and this new approach seems to have improved housing choices. The focus on quality of location and social inclusiveness is the policy lesson learned for future housing programs. ■



Informal settlement on the periphery of Santiago

© Martin O. Smolka

## ABOUT THE AUTHORS

**ISABEL BRAIN** is a sociologist and coordinator of the Urban and Land Policies Program (ProUrbana) at the Catholic University of Chile. Her research addresses urban development, affordable housing, residential segregation, land markets, and informal settlements. Contact: [ibrain@uc.cl](mailto:ibrain@uc.cl)

**PABLO CELHAY** is an economist and researcher at ProUrbana, in Santiago, Chile. He holds a master in public policy from the University of Chicago. Presently is pursuing a master degree in public policy at the Faculty of Economy and Business at the University of Chile. Contact: [pcelhay@osuah.cl](mailto:pcelhay@osuah.cl)

**JOSÉ JOAQUÍN PRIETO** is the director of the Social Observatory at the Alberto Hurtado University in Santiago, Chile. His research focuses on social policies and methodology of applied research. Contact: [jjprieto@osuah.cl](mailto:jjprieto@osuah.cl)

**FRANCISCO SABATINI** is a sociologist and urban planning professor at the Institute of Urban and Land Studies at the Catholic University of Chile. He specializes in social segregation, environmental conflicts, and citizen participation. Contact: [fsabatini@uc.cl](mailto:fsabatini@uc.cl)

The authors thank Pia Mora, Alejandra Rasse, and Claudia Sanhueza for their valuable contributions to the research project on which this article is based.

## REFERENCES

- CASEN. 2006. Ministerio de Planificación. [www.mideplan.cl](http://www.mideplan.cl)
- Fundación un Techo para Chile. 2007. Informe catastro de slumamentos (Slum Cadastre Report). [www.untechoparachile.cl/cis](http://www.untechoparachile.cl/cis)
- Instituto de la Vivienda (INVI). 2001. Diagnóstico de medición de satisfacción de beneficiarios de vivienda básica. Santiago: Universidad de Chile, Facultad de Arquitectura y Urbanismo.
- Sabatini, F., G. Cáceres, and J. Cerda. 2001. Segregación residencial en las principales ciudades chilenas: Tendencias de las tres últimas décadas y posibles cursos de acción" (Residential segregation in the principal cities of Chile: Trends of the last three decades and possible courses of action). *EURE* 27 (82) December.



*Petra Todorovich is director of America 2050 at Regional Plan Association in New York City. America 2050 is a national urban planning initiative to develop an infrastructure plan and a compelling vision for America's future growth. Todorovich oversees the research and advocacy program in partnership with organizations such as the Lincoln Institute of Land Policy and the Rockefeller Foundation. She has written articles on transportation and infrastructure policy, and is a frequent speaker on the topics of transportation policy, megaregions, and national planning.*

*Prior to the launch of America 2050, Todorovich directed Regional Plan Association's Region's Core program and coordinated the Civic Alliance to Rebuild Downtown New York, a network of organizations that formed shortly after 9/11 to promote the rebuilding of the World Trade Center site and Lower Manhattan. She planned numerous public forums and workshops, including the 2002 "Listening to the City" meetings at the Javits Center that brought more than 4,500 people together to consider plans for the World Trade Center site. She authored the 2004 Civic Assessment of the Lower Manhattan Planning Process and other pieces of analysis on the rebuilding process and New York City development.*

*Todorovich received a B.A. from Vassar College and a Master in City and Regional Planning from Rutgers University. Contact: [petra@RPA.org](mailto:petra@RPA.org)*

## Petra Todorovich

**LAND LINES:** *In what capacity do you work with the Lincoln Institute?*

**PETRA TODOROVICH:** I direct the America 2050 initiative, a joint venture of the Lincoln Institute and Regional Plan Association, to develop a national infrastructure plan and growth strategy for United States in the twenty-first century. This program got off the ground in 2005, thanks to the support of the Lincoln Institute for an initial two-day workshop on national planning. We have worked closely ever since to expand the program and advance recommendations for federal policy reform on infrastructure and planning issues.

Since the initial workshop in 2005, I have planned a spring research seminar every year with Lincoln to develop new insights for America 2050. Several of these focused on the changing spatial development patterns of the United States and emerging megaregions. We've brought together a variety of U.S. and international scholars to explore case studies of megaregions in Texas, the Midwest, California, China, and Western Europe, as well as the underlying economic functions that link these places together. This research has laid the foundation for greater recognition of megaregions as an important scale for infrastructure planning and policy making, particularly in the area of transportation.

During the last year, America 2050 has operated a "Rebuilding and Renewing America" campaign, focused on the need to create and implement a national infrastructure plan. We have convened large forums on infrastructure in Washington, DC and a half dozen megaregions across the country to build support for megaregion collaboration and coalition-building on issues such as transportation, water resources, and energy infrastructure.

**LAND LINES:** *What kind of support is there for megaregion planning and collaboration?*

**PETRA TODOROVICH:** The greatest interest seems to arise when there's money on the table. In other words, if adjacent metropolitan regions see that they will fare better in securing federal funding if they work in concert instead of at odds, they will collaborate. But if there's no financial incentive, it is difficult to force cooperation. The flip side is that the leaders in a megaregion recognize a threat that must be resolved through cooperation and joint action. But so far, financial incentives seem to work best.

**LAND LINES:** *Can you describe some examples?*

**PETRA TODOROVICH:** As part of my work at Regional Plan Association, we've convened a coalition in the northeast megaregion of business groups and leaders called the Business Alliance for Northeast Mobility. The Business Alliance came together to address the deterioration of the physical infrastructure and service on Amtrak's Northeast Corridor, which extends from Boston to Washington, DC. We recognized that one state could not fix the problems on the corridor alone—it requires joint planning and investments by Amtrak and as many as 12 different states.

As a result of this group's work and many other efforts, in October 2008 President Bush signed the Passenger Rail Investment and Improvement Act, which authorized increased funding to Amtrak and the states for passenger rail services. Interestingly, this was the legislation used in the recent stimulus bill to appropriate \$8 billion in funding for high-speed rail. So we are now seeing the impact of our work foster megaregion cooperation in a different way.

**LAND LINES:** *Can you explain that impact further?*

**PETRA TODOROVICH:** I think we will see more and more megaregion planning and cooperation in the process of competing for high-speed rail grant funding. This leads to my other example. This summer, the mayors of Atlanta, Charlotte, and a handful of smaller cities in the Southeast held a summit of infrastructure priorities in the Piedmont Atlantic megaregion, as a follow-up to our America 2050 forum in Atlanta held earlier in the spring. The mayors discussed a variety of issues, but made clear that high-speed rail between their cities was a top priority and that they planned to work together moving forward to make it a reality. If the federal high-speed rail program really takes off, which we hope it will, it

should motivate a lot of similar megaregion-scale collaborations. Without planning and collaboration at that scale, it will be difficult to implement high-speed rail successfully.

**LAND LINES:** *One of the goals of America 2050 is to develop a national infrastructure plan. How do you envision that taking place and what should be the role of the regions?*

**PETRA TODOROVICH:** Ideally a national infrastructure plan should converge near the middle of the top-down federal and bottom-up regional planning spectrum. The federal government should provide goals and guidance for infrastructure planning, and the regions need to identify their major infrastructure priorities, and work together at the megaregion scale when needed.

The reason for holding megaregion forums around the country was in fact to get this process started. We recognize that there is a very limited role for the federal government in local planning matters, but when you start to talk about systems that span multiple regions, whether it be high-speed rail, protecting a watershed, or controlling sprawl in border regions between metropolitan areas, the federal government can support multi-state or megaregion-scale cooperation. Better yet, those regions can work together themselves to make plans, identify priorities, and cooperate, and then seek federal support for their priorities. In this way, we've been thinking of megaregions as building blocks to a national plan.

**LAND LINES:** *What are the critical needs and promising opportunities for infrastructure development in transport, water, and energy?*

**PETRA TODOROVICH:** Since each of these areas of infrastructure is vast, and there is no shortage of needs or new opportunities, we narrowed our focus to the aspects of infrastructure that are national or megaregional in scale. In transportation, we think it's time that the federal government prepare and implement a national transportation plan as ambitious and transformative as the interstate highway system. The need for a truly national-scale transportation network that goes beyond automobile travel is driven by the projections of a 40 percent

increase in America's population by 2050 and the need to reduce greenhouse gas emissions by 80 percent in the same period.

We're calling for a Trans-American Network of high-speed rail powered by renewables, electrified freight corridors, a plan to "green" our nation's seaports, and improvements to technology and intermodal connections. Most of the investments are likely to take place in the megaregions, where more than 70 percent of the nation's population and jobs are located today, and thus will require megaregion-scale coordination.

In water infrastructure, our approach is driven by the scale of watersheds and estuaries, which span political boundaries and require megaregion-scale planning. America 2050 is developing recommendations for a systems approach to water resource management, which relies on distributed, multi-purpose solutions for greater efficiency, reduction of non-point source pollution, and natural filtration (though storm swales and rain gardens). In addition to the need for landscape and watershed-scale cooperation, these new strategies will require supportive federal policies.

In energy, there is a real need to invest in the electricity grid and make the transition to the Smart Grid, which integrates transmission with broadband technology, to allow for real-time pricing and demand management. Grid planning again requires collaboration among multiple stakeholders over vast areas and the cooperation of the federal government. Bringing people together to identify common problems or opportunities is an important part of our work.

**LAND LINES:** *How do these infrastructure strategies and regional plans support larger national goals, such as rebuilding an inclusive economy and protecting the environment?*

**PETRA TODOROVICH:** That's important. We're not just promoting infrastructure investment for its own sake. The megaregion plans and sectoral strategies are a prerequisite to America's success in this century. If we don't make adequate infrastructure investments, we are certain to fall behind the economic rise of our global competitors, like China and India. If we don't make *smart* infrastructure investments

that address the climate change challenge head-on, we put the entire planet at risk.

**LAND LINES:** *How will a national strategy address these concerns?*

**PETRA TODOROVICH:** Our most recent RPA-Lincoln research seminar focused on one critical aspect of a national strategy: the need to address underperforming regions and places. Our research identified 640 counties in the nation (about 20 percent of U.S. counties, but just 5 percent of the population) that have not kept pace with national trends of population, employment, and wages. Many of these are formerly resource-based economies that have not been able to make the transition to a service- or knowledge-based economy.

As we begin to emerge from the current recession, and assuming a continued rise in energy prices and international wages, the country needs to plot a course for the future of large industrial or rural regions, including the Midwest, the Great Plains, the Mississippi Delta, and the Gulf Coast, as well as older industrial cities and inner suburbs with high levels of unemployment. A national infrastructure and growth strategy must address the role these regions and places can play in transitioning to a low-carbon economy. This will require massive investment in the design, production, and installation of renewable energy and efficiency components, storage, and transmission. This type of strategy should have a more lasting legacy than the recent \$85 billion bailout for the automobile industry.

**LAND LINES:** *What's next for America 2050?*

**PETRA TODOROVICH:** The Lincoln Institute and Regional Plan Association are hosting an America 2050 National Leadership meeting in Washington, DC in October that will bring together our key partners from around the country to report on progress in the megaregions and review our policy recommendations and legislative strategies. Lincoln is also supporting a major research project that I will be working on with my colleagues at RPA on the economic development opportunities associated with high-speed rail investment in the megaregions. **L**

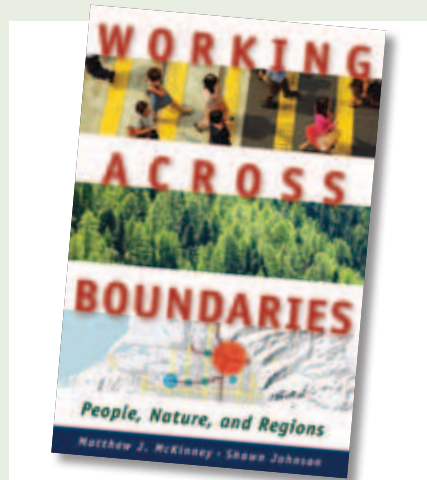
## Working Across Boundaries: People, Nature, and Regions

This book on regional collaboration grows out of what has itself become a long-standing collaboration between the Lincoln Institute of Land Policy and the University of Montana Center for Natural Resources and Environmental Policy (formerly the Public Policy Research Institute). Through a joint venture partnership, we have studied and field tested the ideas in this book over nearly a decade, primarily through training sessions and place-based clinics on regional efforts at sites across North America.

Although it begins with a chapter that answers the question, “Why work across boundaries?”, this book is really more about the “how” of regional collaboration than the “why.” That is appropriate, as it is intended for citizens, practitioners, and policy makers already grappling with the challenges presented by transboundary issues who seek guidance on the process by which regional solutions can be identified and implemented.

Authors Matthew McKinney and Shawn Johnson present an array of practical and tested strategies and techniques that can be employed across the broad range of land use, natural resource, and environmental issues at scales ranging from the metropolitan to the megaregional, including watersheds and ecosystems. Whether you are deeply engaged in a regional initiative, or just beginning to explore a regional strategy, this book provides a robust set of four stages, ten guiding principles, five key questions for regional governance, and seven habits of effective implementation that can be referred to before, during, and after undertaking regional collaboration.

Although this is not a book of theory, regional collaboration as presented here draws heavily on its sister (or perhaps, parent) field, consensus building, which is itself based on the theory of mutual gains negotiation. In a sense, regional collaboration is about consensus building in space, and some of the approaches and terminology will be familiar to those trained in consensus building, mediation, negotiation, and related



### Working Across Boundaries: People, Nature, and Regions

Matthew J. McKinney  
and Shawn Johnson  
2009 / 176 pages / Paper / \$25.00  
ISBN 978-1-55844-191-0

#### Ordering Information

Contact Lincoln Institute at  
[www.lincolninst.edu](http://www.lincolninst.edu)

areas of practice. One shared insight from theory is that these processes, to be sustained, need to fulfill an expectation that the benefits to participating stakeholders will exceed the costs. In the long run, regional efforts need to be measured by regional results.

The spatial component makes this process interesting to many planners, but also helps to explain why regional collaboration can appear complex and difficult. We are often dealing with diverse stakeholders and conflicting interests that play out across complicated geographies. One case study that runs the gamut of regional land

use, natural resource, and environmental issues is Calgary, Alberta, Canada.

Calgary is at the core of a metropolitan region of 19 municipalities struggling with urban/suburban conflicts over rapid growth, including water supply and wastewater issues, played out in a landscape of massive resource extraction (oil sands) and important habitat for moose, bear, and beaver. Other case studies and examples from across North America help to illustrate the principles, processes, and outcomes of diverse efforts by local officials and a host of networks, partnerships, and regional institutions to close the regional governance gap by working across boundaries.

#### Contents

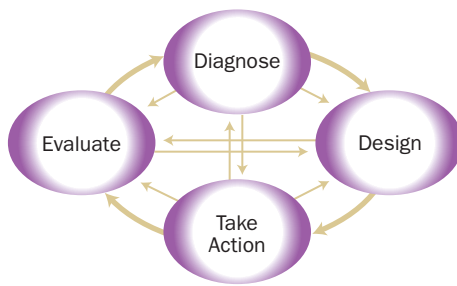
- Foreword, Armando Carbonell
- 1. Why Work Across Boundaries?
- 2. Closing the Governance Gap
- 3. A Principled Approach to Regional Collaboration
- 4. Diagnose the Need for Regional Collaboration
- 5. Match the Process to the Situation
- 6. Formulate and Implement Actions
- 7. Evaluate, Learn, and Adapt
- 8. Models of Regional Governance
- 9. Improving Regional Collaboration

#### ABOUT THE AUTHORS

**Matthew J. McKinney** is director of the Center for Natural Resources and Environmental Policy at The University of Montana, where he also serves as chair of the Natural Resources Conflict Resolution Program. Contact: [matt@cnrep.org](mailto:matt@cnrep.org)

**Shawn Johnson** is an associate of the Center and a doctoral student at the University of Michigan’s School of Natural Resources and Environment. Contact: [shawn@cnrep.org](mailto:shawn@cnrep.org)

#### The Stages of Regional Collaboration





## The Impact of Large Landowners on Land Markets

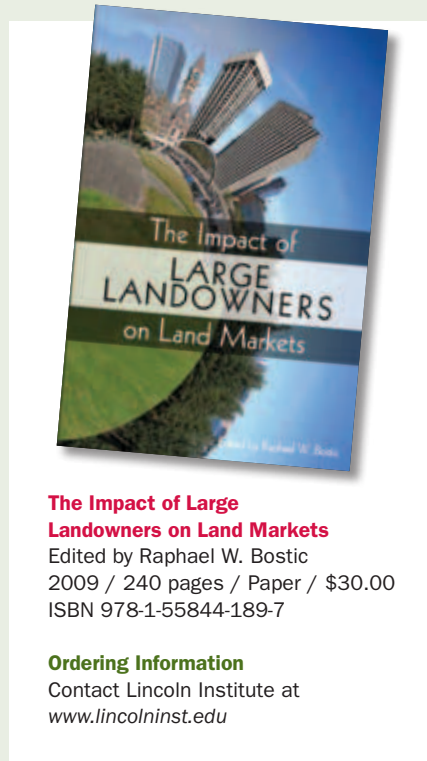
What happens when one owner or one institution has significant control over the local land market? What tensions might this create between public and private interests?

The research studies compiled in this volume by Raphael W. Bostic provide a strong argument that large landowners represent an ideal group through which to study land use, and how these many forces interact and converge to shape outcomes, governance, and institutional form. The approach here is to be illustrative, so the authors focus on three aspects: land supply decisions, economic productivity, and the planning process.

The chapters examine these issues by looking at large landowners in various contexts. In the United States, for example, the large tracts of land held by private owners are often situated on the fringes of metropolitan areas. Frequently this land is in transition from agricultural to urban uses, and represents a source of income or a legacy for the next generation. Many universities and other nonprofit institutions also own large parcels of land. Because they contribute to the urban economy, they often hold the bargaining advantage in comparison to other actors when town-gown issues arise.

In Nigeria, like much of Africa, a considerable portion of land is held privately, albeit communally. Here, land ownership and land supply decisions have more to do with family or clan marriages than with the logic of city building.

How do the actions of individual landowners affect our capacity to create cities that work for all? How well can these individual actors balance the competing interests of those living in neighborhoods, towns, cities, and regions? Each chapter highlights the behaviors of the actors in the land market. Despite the conflicts that can arise between the stakeholders during the development process, these tensions are not the problem. Rather, they are the challenge and the opportunity for us to collectively shape our cities.



**The Impact of Large Landowners on Land Markets**  
 Edited by Raphael W. Bostic  
 2009 / 240 pages / Paper / \$30.00  
 ISBN 978-1-55844-189-7

**Ordering Information**  
 Contact Lincoln Institute at  
[www.lincolnst.edu](http://www.lincolnst.edu)

The studies individually offer new and interesting insights into central issues associated with land use and development. Taken together, they span a rich cross-section of large landowners in terms of industry, geography, and development context. Other cases varied in circumstances and outcomes should be useful for obtaining an even clearer and deeper understanding of how land use, land supply, planning, industrial structure, and economics interact to shape outcomes.

Understanding the interests represented by large landowners can be an important step in conducting broader benefit-cost analyses of particular land use policies and decisions. Research exploring these issues can lead to more effective policy analysis and assessment, and ultimately to tangible improvements in the character of the decisions reached. This volume serves as a catalyst for researchers to consider the study of large landowners and the development of new frameworks for characterizing these complex arrangements.

### Contents

Foreword, *Rosalind Greenstein*  
 Introduction, *Raphael W. Bostic*

#### Part I: Land Supply Decisions

1. Understanding Large Landholders on the Urban Fringe: A Supply-Side Perspective, *Pengyu Zhu and Raphael W. Bostic*
2. Customary Landholders and the Planning Process in Contemporary Enugu, Nigeria, *Cosmas Uchenna Ikejiofor*

#### Part II: Economic Productivity

3. The Neighborhood Dynamics of Hospitals as Large Landowners, *Raphael W. Bostic, LaVonna B. Lewis, and David C. Sloane*
4. Bringing the Campus to the Community: An Examination of the Clark University Park Partnership after Ten Years, *John Brown and Jacqueline Geoghegan*

#### Part III: The Planning Process

5. Large Landowners as Plan Makers: St. Joe and the Future of the Florida Panhandle, *Timothy S. Chapin*
6. Public Sector Land Developers in New Delhi and Bangalore, India: A Comparison of Processes and Outcomes, *David L. Gladstone and Kameswara Sreenivas Kolapalli*

Conclusion, *Raphael W. Bostic*

#### ABOUT THE EDITOR

**Raphael W. Bostic** is a professor in the School of Policy, Planning, and Development at the University of Southern California. He is currently on leave to serve as assistant secretary for policy development and research at the U.S. Department of Housing and Urban Development, to help create a blueprint for solid housing policies. Contact: [bostic@sppd.usc.edu](mailto:bostic@sppd.usc.edu)

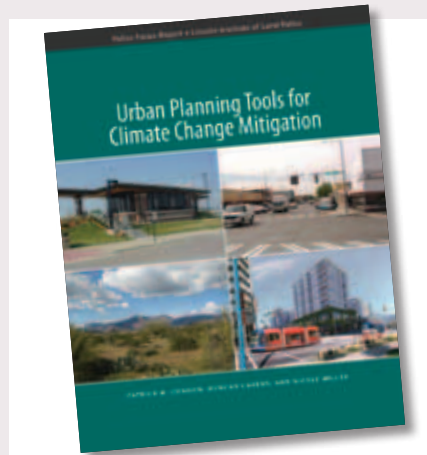
## Urban Planning Tools for Climate Change Mitigation

The scale of intervention required to reduce and adapt to the effects of climate change will require action at all levels of government and society. International accords and some federal and state governments are beginning to address greenhouse gas (GHG) reduction targets, but it is at the local level that most decisions about urban form are made. Yet urban planners and local decision makers generally lack the tools and means needed to make informed choices about the climate change implications of local growth and redevelopment decisions, or to measure the effects of their decisions.

While a wide spectrum of tools currently exists, few have the capacity to work simultaneously at both the regional and local scale, or to capture the multiple consequences of regulatory decisions. They generally lack the capacity to model the land use–GHG relationship in a way that informs the policy process in real time.

The Lincoln Institute of Land Policy and the Design Centre for Sustainability at the University of British Columbia have been engaged in surveying existing tools that support land use policy and decision making in the context of climate change mitigation and urban planning at local and regional levels. To date, two international workshops have been held in Vancouver, an area at the forefront of mitigation policy for greenhouse gas (GHG) emissions. The meetings brought together many of North America's leaders in tool development, policy implementation, and urban development regulation.

Patrick M. Condon, Duncan Cavens, and Nicole Miller at UBC draw from those meetings and review the relationship between urban planning and GHG emissions as a key component of climate change. This report provides characteristics of GHG decision support tools, and evaluates the strengths and limitations of a cross section of existing tools using those characteristics. Four case studies illustrate how selected tools are already being used in the urban planning and development process in the United States and Canada.



### Urban Planning Tools for Climate Change Mitigation

Patrick M. Condon, Duncan Cavens, and Nicole Miller  
2009 / 48 pages / Paper / \$15.00  
ISBN 978-1-55844-194-1  
Policy Focus Report / Code PF021

#### Ordering Information

Contact Lincoln Institute at  
[www.lincolninst.edu](http://www.lincolninst.edu)

While no one tool can yet address all of the desiderata identified by officials and experts, the potential to build on the strengths of existing tools is promising. Continued tool development will serve to enhance connections among various tools, create new methods of evaluating urban form and GHG emissions, and establish test cases through which new tools can be applied and refined. An ideal tool or integrated suite of tools should have the following characteristics.

- *Comprehensive*: able to capture the GHG contributions of all relevant sectors and criteria related to the economy and livability.
- *Three-dimensional*: grounded in the physical realities of the urban spaces they seek to model.
- *Multi-scalar*: able to connect top-down (from regional to block scale) with bottom-up analysis.
- *Policy-relevant*: supportive of the way policy is made and implemented by local decision makers.

- *Iterative*: capable of testing alternative scenarios in real time to produce results that can be evaluated rapidly.
- *Additive*: able to build on and link to existing models and related applications.
- *Accessible*: intelligible to a range of stakeholders, using a common language and interface with transparent outputs.
- *Affordable*: relatively inexpensive to acquire and easy to use.

To produce such a tool or suite of tools may appear daunting, but the need is great to support effective planning and regulatory decisions, and to set and adjust policy. This report can guide public officials and proponents of development projects in making better informed decisions with respect to climate change impacts, and can help tool developers and modelers identify critical needs as they design the next generation of planning support tools.

#### ABOUT THE AUTHORS

**Patrick M. Condon** is a professor in the School of Architecture and Landscape Architecture, holder of the James Taylor Chair in Landscape and Livable Environments, and a senior researcher at the Design Centre for Sustainability at the University of British Columbia. He was a visiting fellow of the Lincoln Institute in 2007–2008. Contact: [p.m.condon@gmail.com](mailto:p.m.condon@gmail.com)

**Duncan Cavens**, a postdoctoral fellow in the UBC School of Architecture and Landscape Architecture, focuses on urban modeling and simulation tools in participatory processes. Contact: [duncan@cavens.org](mailto:duncan@cavens.org)

**Nicole Miller**, a Ph.D. candidate in Resource Management and Environmental Studies at UBC, and researcher at the Design Centre for Sustainability, studies development patterns as a way to model the GHG implications of urban form. Contact: [nimiller@interchange.ubc.ca](mailto:nimiller@interchange.ubc.ca)

The Lincoln Institute supports research fellows and other collaborators who document their research in working papers that are posted on the Institute Web site for free downloading ([www.lincolninst.edu/pubs](http://www.lincolninst.edu/pubs)).

More than 600 working papers are currently available, including the results of Institute-sponsored research, course-related materials, and occasional reports or papers cosponsored with other organizations. Additional papers by associates affiliated with the Institute's programs in Latin America and China are available in Spanish, Portuguese, or Chinese.

Listed here in alphabetical order by author are selected papers that have been posted since January 2009.

Vicki Been, Ingrid Gould Ellen, and Michael Gedal  
**Teardowns and Land Values in New York City**

Vicki Been, Ingrid Gould Ellen, Josiah Madar, and Simon McDonnell  
**Underused Lots in New York City**

Eric S. Belsky and Daniel McCue  
**Comeback Cities or the New Melting Pots: Explorations into the Changing Large Cities of New England**

Rebecca Boldt, Bradley Caruth, and Andrew Reschovsky  
**Exploring Changes in Homeowner Property Taxes in Wisconsin, 2000 to 2005**

Darby Bradley  
**Amending Perpetual Conservation Easements—Confronting the Dilemmas of Change: A Practitioner's View**

Leah Brooks and Justin Phillips  
**When and Why Do Cities Bind Themselves?: The Existence and Extent of Locally Imposed Tax and Expenditure Limits**

Armando Carbonell and Douglas J. Meffert  
**Climate Change and the Resilience of New Orleans: The Adaptation of Deltaic Urban Form**

Katrina Connolly and Michael E. Bell  
**Area-Based Property Tax Systems: Current Practice and Equity Concerns**

Morris A. Davis  
**The Price and Quantity of Land by Legal Form of Organization in the United States**

Chengri Ding, Yan Song, Yang Zhang, Wu Cifang, Gerrit Knaap, and Terry Moore  
**Assessment on Planning Institutional Arrangements for Better Managing Urban Growth in China**

Thomas Downes  
**The Impact of Education Reforms on Property Values: A Review of the Literature**

Mortimer L. Downey III  
**Legislative Considerations for Long-Term Policy Change**

Mary Edwards  
**Fiscal Impact Analysis: State of the Art**

Richard C. Feiock  
**Community Acceptance of High-Density Development**

Patrick Field, Kate Harvey, and Matt Strassberg  
**Integrating Mediation into Land Use Decision Making**

Ronald C. Fisher  
**Property Taxes for Local Finance: Research Results and Policy Perspectives (Reconsidering Property Taxes: Perhaps Not So Bad After All)**

Arturas Kaklauskas, Arvydas Bagdonavicius, and Albina Aleksiene  
**Further Development and Practical Application of Market-Based Land Mass Appraisal On-Line System for Land Taxation**

Sally Kwak  
**Biases in Analysis of Split-Rate Property Tax Reforms: Hawaii's Experience, 1963–1979**

Adam Langley  
**Estimates of the Total Cost and Distribution of Tax Relief Under State Funded Property Tax Circuit Breakers**

Amnon Lehavi  
**The Strand Not Taken: The Taxing/Taking Taxonomy in American Property Law**

Stanley D. Longhofer and Christian L. Redfearn  
**Estimating Land Values Using Residential Sales Data**

Gary Maring  
**Future Financing Options to Meet Highway and Transit Needs**

Michael D. Meyer, P.E.  
**Toward a Vision for the Nation's Surface Transportation System: Policies to Transcend Boundaries and Transition to a New Era**

Kurt Paulsen  
**The Effects of Land Development on Municipal Finance: A Conceptual Overview**

Elizabeth Plummer  
**Evidence on the Distributional Effects and Administrative Feasibility of a Land Value Tax: Who Wins, Who Loses, and Can It Happen?**

Andrew Reschovsky and Adam Langley  
**Enhancing the Feasibility of School Finance Reform**

Vera F. Rezende, Fernanda Furtado, Maria Teresa C. Oliveira, and Pedro Jorgensen, Jr.  
**Review of the Literature on the Foundations of Outorga Onerosa do Direito de Construir (OODC): The Sale of Building Rights in Brazil**

Timothy A. Richards  
**Driving Climate Change Mitigation at All Levels in the West**

Carla J. Robinson  
**Issues in Sustainable Community Development**

Carla J. Robinson  
**Planning for Sustainable Community Development**

L. Nicolas Ronderos  
**Spatial Strategies for U.S. Economic Development: New Strategies for Regional Economic Development—America 2050 Research Seminar**

Maria Teresa Souza  
**The Effect of Land Use Regulation on Housing Price and Informality: A Model Applied to Curitiba, Brazil**

Aaron Twait and Mark Haveman  
**What Drives the Property Tax?: A Holistic Examination of City and County Budgets in Minnesota**

Maria Camila Uribe and Juan Carlos Bejarano  
**Annotated Bibliography on Property Tax in Latin America**

Jean-Louis van Gelder  
**Assessing Fit: Perceptions of Informality and Expectations of Legality**

*Also available in Spanish:*  
**Evaluando adecuación: percepciones de informalidad y expectativas de legalidad**

Laurie A. Wayburn  
**Forests in United States Climate Policy: A Comprehensive Approach**

Robert D. Yaro  
**Toward a National Strategy for Underperforming Regions**

Bing Yuan, Katrina Connolly, and Michael E. Bell  
**A Compendium of Countries with an Area-Based Property Tax**

Marisa A. Zapata  
**Visible Fingerprints: Tracing a California NGO's Impacts on Regional Governance**

**Reports on Taxation in Africa**

The Lincoln Institute and the African Tax Institute (ATI), located at the University of Pretoria, South Africa, have formed a joint venture to better understand property-related taxation in Africa. Its goal is to collect data and issue reports on the present status and future prospects of property-related taxes in all 54 African countries, with a primary focus on land and building taxes and real property transfer taxes. Each report aims to provide concise, uniform, and comparable information on property taxes within a specific country or region, considering both the system as legislated and tax in practice.

More than 30 reports are currently posted on the Lincoln Web site, documenting countries throughout Africa. See the article on Mapping Property Taxes in Africa, by Riel C.D. Franzsen and Joan Youngman, in the July 2009 issue of *Land Lines* for additional information about this joint venture research project, and search the Lincoln Institute Web site for reports on specific countries ([www.lincolnst.edu/pubs](http://www.lincolnst.edu/pubs)).

**Special Offer on Land Policy Books**

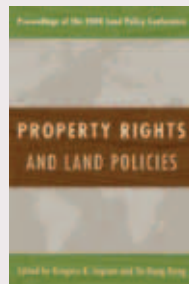
The Lincoln Institute presents its annual Land Policy Conference each June to explore international trends and issues in land use, taxation, and public policy. Selected proceedings are published in a special volume the following spring. Three such volumes are now available individually for \$30.00 or as a set for \$75.00. To order the set of three books, go to the Institute's Web site ([www.lincolnst.edu](http://www.lincolnst.edu)) and search for any one of the titles.

**Property Rights and Land Policies**

Edited by Gregory K. Ingram and Yu-Hung Hong

**Contributors** R. J. Anderson, A. Azuela, A. Bell, D. Burtraw, S. Butler, K. Deininger, K. Dillman, J. Eckert, R. Ellickson, G. Feder, E. Fernandes, L. Fisher, H. Jacobs, J. Kayden, G. Korngold, E. Ostrom, D. Perkins, V. Renard, B. Renaud, and R. Sweeney

2009 / 496 pages / Paper / \$30.00 / ISBN: 978-1-55844-188-0



**Fiscal Decentralization and Land Policies**

Edited by Gregory K. Ingram and Yu-Hung Hong

**Contributors** E. Ahmad, R. Bahl, G. Brosio, L. DeMello, W. Fischel, S. Gerking, S. Guimaraes, J. Martinez-Vazquez, D. McMillen, T. Nechyba, R. Nelson, C. Sepulveda, H. Sigman, L. Singell, P. Smoke, B. Tanzi, S. Wallace, and C. Zinnes

2008 / 432 pages / Paper / \$30.00 / ISBN: 978-1-55844-178-1



**Land Policies and Their Outcomes**

Edited by Gregory K. Ingram and Yu-Hung Hong

**Contributors** D. Barker, E. Belsky, E. L. Birch, R. M. Bird, S. C. Bourassa, K. E. Case, D. Dowall, R. W. England, E. L. Glaeser, P. Hall, D. McCue, R. Mohan, T. J. Nechyba, A. J. Plantinga, J. M. Quigley, E. Slack, and X. D. Zhu

2007 / 464 pages / Paper / \$30.00 / ISBN: 978-1-55844-172-9



## Courses and Conferences

The education programs listed here are offered as open enrollment courses for diverse audiences of elected and appointed officials, policy advisers and analysts, taxation and assessing officers, planning and development practitioners, business and community leaders, scholars and advanced students, and concerned citizens.

For more information about the agenda, faculty, accommodations, tuition, fees, and registration procedures, visit the Lincoln Institute Web site at [www.lincolninstitute.edu/education/courses.asp](http://www.lincolninstitute.edu/education/courses.asp).

## Programs in the United States

### NATIONAL COMMUNITY LAND TRUST ACADEMY

John Davis, CLT Academy Dean, Burlington Associates in Community Development

The Lincoln Institute and the National Community Land Trust Network joint venture provides comprehensive training taught by highly skilled and experienced instructors on theories and practices unique to community land trusts. The CLT Academy promotes public understanding of the community land trust model, sets a high standard for practitioner competence, and supports research and publication on evolving practices.

A community land trust is a means to allow community-based nonprofit organizations to own land and then lease it to building owners. Future increases in the value of the land remain with the community land trust and do not affect the value of the buildings, so the housing built on CLT land can remain affordable in the long run.

TUESDAY–FRIDAY, OCTOBER 27–30

Athens, Georgia

### CLT Annual Conference

At the annual conference of the National CLT Network the following day-long courses will be offered, as well as a range of other activities and seminars addressing current issues such as:

- Incorporating Green Building Techniques into CLT Projects;
- Building Successful Partnerships Between CLTs and Local Habitat for Humanity Affiliates
- Engaging CLT Homeowners;
- Facilitating Ongoing Maintenance of CLT Homes;

- Conservation and CLTs: Issues and Possibilities;
- Urban Agriculture under the CLT Model; and
- Navigating the Current Down Market: CLTs, Foreclosures, and Organizational Adjustments;

THURSDAY, OCTOBER 29

### Planning for Organizational Growth and Long-Term Sustainability

CLTs build a portfolio of permanently affordable housing. This commitment has significant implications for how the organization plans and budgets for the future. Although CLTs differ in their funding, capacity, size, and service area, there is enough commonality in mission and program to discern basic “rules-of-thumb” for building a strong, sustainable organization. Participants will gain tools and perspective on how to plan for organizational growth and sustainability.

FRIDAY, OCTOBER 30

### The City–CLT Partnership

Participants learn about the key elements of the city–CLT relationship, identifying common pitfalls and best practices from and throughout the country, and reviewing essential aspects of a negotiation between a CLT and a local government. Participants are exposed to the challenges that arise when local governments choose to support community land trusts. Highlighted are the best practices that local governments have devised to help CLTs to grow and develop. This course uses the Lincoln Institute policy focus report on *The City–CLT Partnership*, published in 2008.

FRIDAY, OCTOBER 30

### CLT Stewardship

Participants will examine the challenges that face a CLT in managing an expanding portfolio of resale-restricted, owner-occupied housing after these homes are sold. Among the topics that participants will consider are: contractual responsibilities of the CLT; monitoring and managing resales; promoting sound maintenance; and preventing foreclosures in good economic times and bad. Participants will be expected to have a working knowledge of the CLT model and to have reviewed the “model” CLT ground lease prior to attending the course. This lease is posted on the CLT Network’s Web site at [www.clnetwork.org](http://www.clnetwork.org)

## AUDIO/WEB CONFERENCE TRAINING SERIES

The annual Audio/Web Conference Training Series cosponsored with the American Planning Association is designed for planning commissioners and other officials. Live audio conferences are broadcast to a national audience of planning and elected officials via telephone and the Internet, with corresponding packages of instructions, agendas, and background reading materials. To register, call the APA at 312.786.6729 or visit [www.planning.org](http://www.planning.org).

WEDNESDAY, NOVEMBER 18

4:00–5:00 PM ET

### Planning with Large Institutions

Hospitals, universities, and other large institutions have a dramatic impact on their host communities. At times the needs of the institution conflict with those of the community; in other situations, the institutions may be committed to sustaining the surrounding neighborhoods and local planners and officials are challenged to help guide investment and development. Learn how institutions and communities can work together successfully and discover the roles the planning commission and other officials play.

WEDNESDAY, DECEMBER 9

3:00–4:30 PM ET, 7:00–8:30 PM ET

### Introduction to the Planning Commission: Part One

Part One introduces the concept, principles, and practice of planning. Planners discuss who does planning and within what framework of government decision making, context, and legal foundation. Panelists then discuss decision making and the powers and duties of the commission. Highlights include information on ethics, meeting conduct, and how to reach and record decisions. The third segment focuses on the comprehensive plan and its elements. This is amplified by an overview of special plans and overall policy integration. Finally, the discussion turns to the development review process. This includes a concise overview of growth management and design and site review, and concludes with a summary of the legal issues related to the review process.

**WEDNESDAY, FEBRUARY 17, 2010  
3:00–4:30 PM ET, 7:00–8:30 PM ET  
Introduction to the Planning  
Commission: Part Two**

Part Two discusses the players involved in the planning process, the points of view they bring to planning, and how the commission works with these players. Speakers review plan implementation, subdivision regulation, and how the plan is amended. Hear the newest approaches to the techniques of planning. Examine how to engage citizens, resolve conflicts, and forge relationships.

**Programs in Latin America**

**MONDAY–FRIDAY, OCTOBER 19–23  
San José, Costa Rica  
Urban Land Market Analysis  
Martim Smolka and Ciro Biderman,  
Lincoln Institute of Land Policy**

This course covers the main theories inspiring empirical modeling and hypothesis testing, methods of data gathering, and analysis related to land market performance indicators. Attention is given to the specificities of spatial analysis including cluster analysis and spatial econometrics. The course provides academic researchers and land policy practitioners tools for understanding formal and informal urban land markets, the impacts of land use regulations, and public urban infrastructure and services interventions.

**SUNDAY–FRIDAY, NOVEMBER 15–20  
Quito, Ecuador  
Large-Scale Urban Redevelopment  
Projects  
Martim Smolka, Lincoln Institute of Land  
Policy; and Eduardo Reese, Conurbano  
Institute, General Sarmiento National  
University, Buenos Aires, Argentina**

This course focuses on a set of large-scale interventions taking place in Quito, Ecuador, such as the new international airport and ground transportation terminal, the lake park, and the redevelopment of the city historic center. The course is cosponsored with the Latin American School of Social Sciences (FLACSO), the Latin American and Caribbean Historical Centers Organization (OLACCHI) and Development Bank of Ecuador (BEDE).

**FELLOWSHIP** *programs*

**LATIN AMERICAN RESEARCH  
FELLOWS**

The Program on Latin America and the Caribbean has named ten research fellows for 2009–2010. These fellows were selected from among more than 145 applicants to the Institute's call for research proposals on land policy and urban development in Latin America. Information about the RFP for 2010–2011 will be posted on the Institute's Web site in the spring of 2010.

**Diogo R. Coutinho**  
*Faculty of Law  
University of São Paulo, Brazil*  
**The Social Function of Property,  
Housing Policies, and Legal Tools  
in Brazil: Case Studies of Three  
Municipalities**

**Carlos E. Ferrufino**  
*Department of Territorial Organization  
Central American University José Simeón  
Cañas, San Salvador, El Salvador*  
**Private Subdivisions in El Salvador:  
A Case Study of Access to Urbanized  
Land by the Poor**

**Sebastian Galiani**  
*Department of Economics  
Washington University  
St. Louis, Missouri*  
**Impact of Railway Expansion  
on Urban Spatial Patterns**

**Néstor F. Garza**  
*Department of Economics  
University of the North  
Barranquilla, Colombia*  
**Regulation and Land Prices  
in Barranquilla**

**Marco Aurélio S. González**  
*Civil Engineering Department  
University of the Valley of Rio dos Sinos  
São Leopoldo, Brazil*  
**A Feasibility Study of Building  
Renovation: Alternative Supply for  
Social Housing**

**Danilo C. Iglori**  
*Department of Economics  
University of São Paulo, Brazil*  
**Urban Evolution in São Paulo:  
Density, Industrial Location, and  
Local Economic Development**

**Juan Felipe Pinilla**  
*Faculty of Law  
University of the Andes  
Bogotá, Colombia*  
**Experience in Property Tax Innovation:  
The 110% for Bogotá Campaign**

**Rosendo M. Pujol**  
*Sustainable Urban Development  
Department  
University of Costa Rica, San José*  
**Historical Trends in Municipal  
Revenues in Costa Rica before and  
after a Change in Property Tax Law**

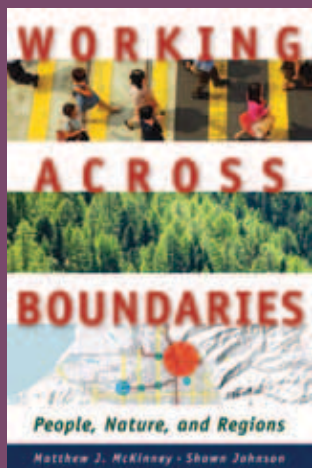
**Francisco R. Sabatini**  
*Institute of Urban and Territorial Studies  
Catholic University of Chile, Santiago*  
**Evaluation of the Effects of the  
Differential Location Subsidy  
on Land Prices and Location  
of Social Housing in Chile**

**David M. Vetter**  
*David Vetter Economic Consultant, Ltd.  
Petrópolis, Brazil*  
**How Could Land-based Financing  
Instruments Increase the Investment  
Capacity of Brazil's Municipalities with-  
out Unduly Raising Their Indebtedness?**

# What's New on the Web

## Resources and Tools for Regional Collaboration

<http://www.lincolinst.edu/subcenters/regional-collaboration/>



A critical part of the Institute's mission is to be a resource for researchers, practitioners, policy makers, and the media. The Resources and Tools section of the Institute's Web site provides both practical tools that include case studies, model representations, and best practices, and extensive information resources in the form of databases and other materials. Twelve subcenters are currently available for viewing.

The Regional Collaboration subcenter has been revised and expanded recently in conjunction with the publication of the Lincoln Institute book, *Working Across Boundaries: People, Nature, and Regions*, by Matthew McKinney and Shawn Johnson (see page 22 of this *Land Lines* issue).

Many of today's most compelling land use, natural resource, and environmental issues—such as climate change, land use, water allocation, and landscape conservation—require people and institutions to work across jurisdictional lines and other boundaries. As illustrated on this site, transboundary issues occur at many spatial scales.

There is no single model for regional collaboration, no universal approach that works in all situations. But the principles and tools in the book and on this site can help guide planning activities that cross boundaries. The best efforts are homegrown, tailoring the principles and tools to suit the issue at hand and the unique needs and interests of each region.

This work is coordinated by Matthew McKinney, director of the Center for Natural Resources and Environmental Policy at The University of Montana, through a joint venture partnership with the Lincoln Institute. For more information about the center, go to [info@cnrep.org](mailto:info@cnrep.org).



# Land Lines

OCTOBER 2009

## 2009–2010 Program

The Lincoln Institute's annual Program for 2009–2010 presents a comprehensive overview of the Institute's mission and its diverse programs for the new academic year. It includes department descriptions; courses, seminars, conferences, and on-line education programs; research, demonstration, and evaluation projects; publications and multimedia products; Web-based resources and tools; and lists of fellows and faculty. The complete Program catalog is posted on the Lincoln Institute Web site for free downloading. To request a printed copy, contact [help@lincolninst.edu](mailto:help@lincolninst.edu).

