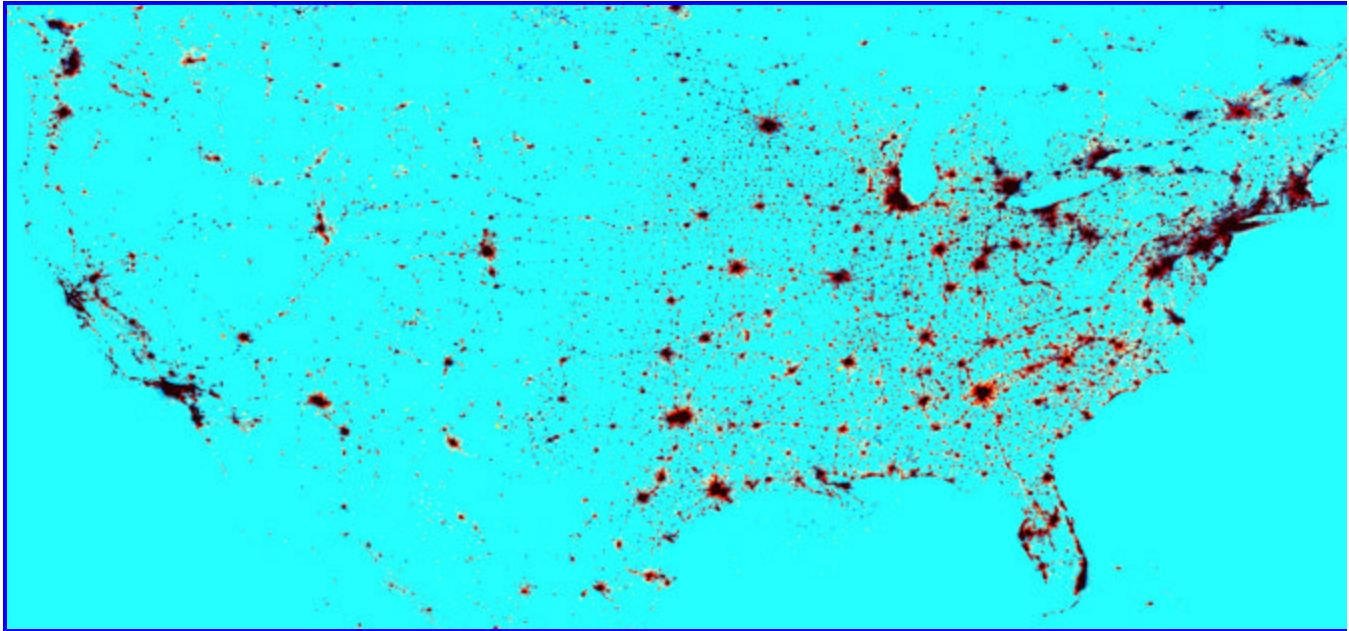


Sprawl

Sprawl Highlights

New Products (continued)

Nighttime Lights Change Analysis USA 1992-93 versus 2000



Black = Lights saturated in both time periods.

Red = Lights brighter in 2000.

Yellow = Lights only present in 2000.

Blue = Lights only present in 1992-93.

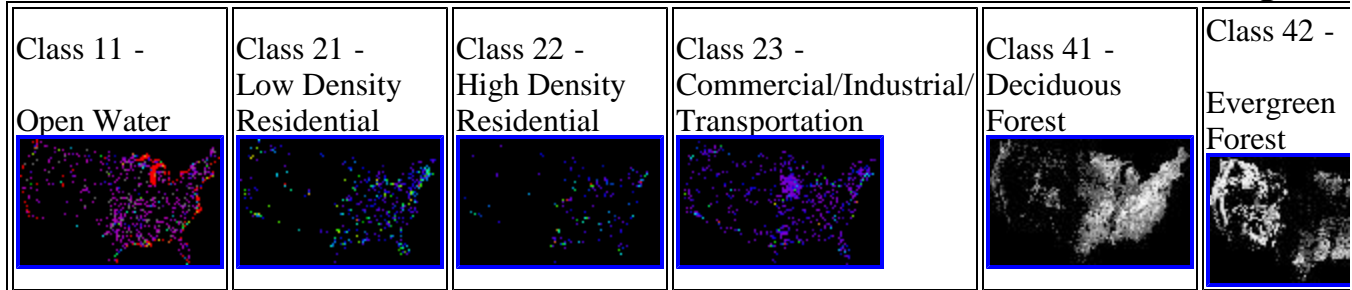
Gray = Dim lighting detected in both time periods, but little change in brightness.

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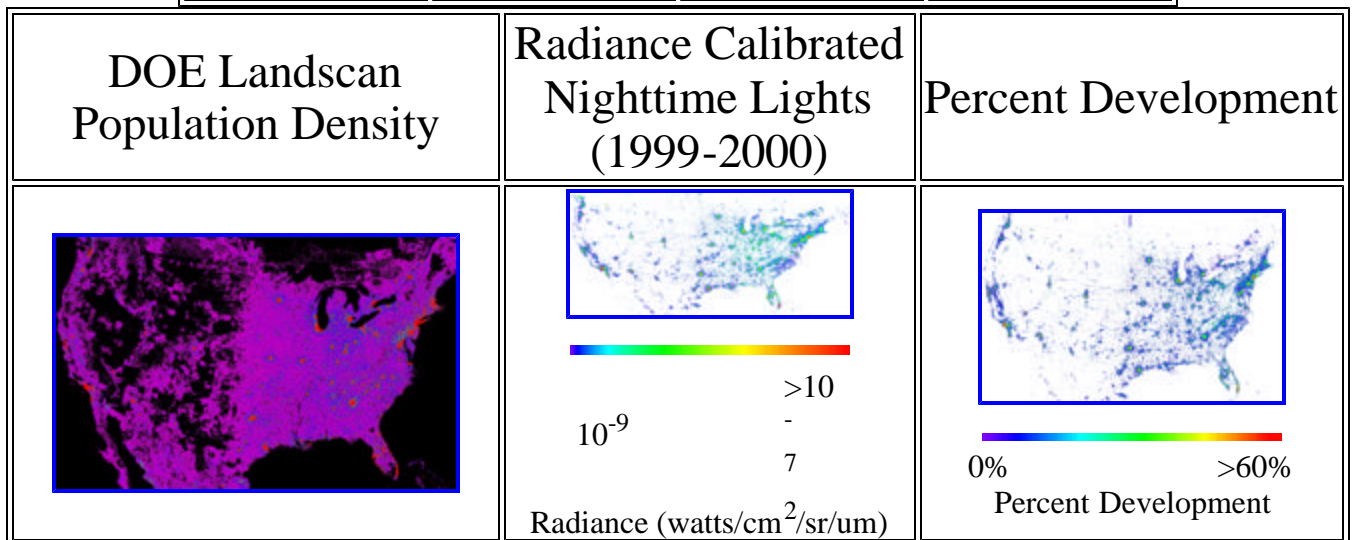
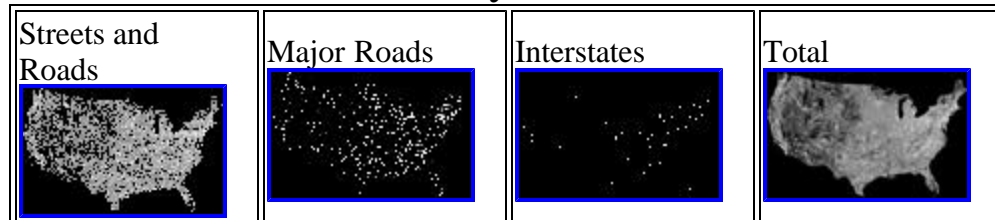
New Products

Coregistered Set of 1 km Grids of the USA

MRLC Land Cover from Landsat TM - all 21 classes, including:



Road density of the USA.



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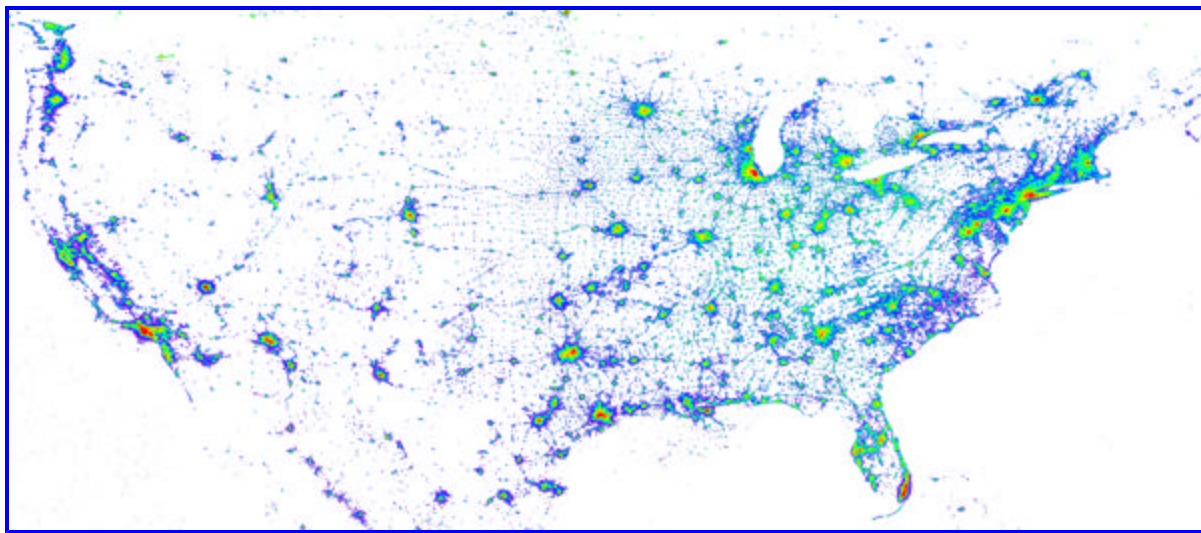
Future Potential

The project enabled NGDC to experiment with and refine a set of methods for generating improved radiance calibrated nighttime lights. NGDC used the LCLUC project to justify the collection of global nighttime OLS at reduced gain settings, which could be used to make the global product. We also developed a set of methods to generate nighttime lights change products.

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New Findings

Not Just a Pretty Picture: Radiance calibrated nighttime lights can be used to make quantitative estimates of development levels.



10^{-9}

>10

-

7

Radiance (watts/cm²/sr/um)

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The proportion of Social Science in the study:

40%

The proportion of the LCLUC themes that are covered in their project:

40% carbon, 10% water, and 10% nutrients

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Relevance

We are analyzing the impacts of development on the terrestrial carbon dynamics of the USA. Surfaces covered by constructed materials (roads, buildings, etc.) are withdrawn from photosynthesis and respiration. This loss is counterbalanced to some extent by managed vegetation (lawns, trees, etc.), which may be irrigated and fertilized. Unlike other types of disturbances, development typically does not have a recovery phase. Other disturbances such as deforestation have a demonstrable effect on terrestrial carbon dynamics. Our results should be useful for improving our understanding, modeling and prediction of the global carbon cycle and the build up of carbon dioxide in the atmosphere.

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Most Significant Results

Both satellite data as well as modeled phenology show that urban vegetation tends to green up earlier than non-urban vegetation. The difference is about 2-7 days.

Preliminary carbon sequestration estimates suggest that development reduced carbon sequestration potential by 2.2% in the U.S. This loss translates to about 0.06 Gt of carbon per year.

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