Field Guide to the Datasets

Version 10- 12-2017 (For an updated version of most of this information, please visit the UMass-Amherst site: https://ag.umass.edu/resources/land-conservation-tools)

With the proliferation of conservation prioritizations in Massachusetts in the past 5 years and the need for strategic land acquisition, it can be challenging for conservation practitioners to keep track of the various analyses, know what's out there and how they relate to one another, and how to best apply them. This short guide is intended to capture datasets of most use and relevance to the members of the Berkshire Wildlife Linkage (BWL) Partnership and to clarify the distinguishing features of each. Each dataset description includes the following information:

Author
Year released
Geographic scope
What question is it designed to answer
How is it similar or different from other analyses
How can it be applied? Examples of applications
Public availability

In addition, this document describes a collection of conservation initiatives that have built upon these datasets, as well as a brief description of grant programs, potential use scenarios, and additional tools and resources of relevance to the BWL partnership members.

Table of Contents

Datasets

BioMap2

Author: Massachusetts Natural Heritage and Endangered Species Program (NHESP), The Nature Conservancy in Massachusetts

Year Released: 2010

Geographic scope: Statewide in Massachusetts, all freshwater and terrestrial systems.

What question is it designed to answer? BioMap2 is designed to be a tool to guide land protection. It identifies the key places to protect in Massachusetts that will ensure the state's biodiversity and ecosystem processes into the future.

Key data products:
Core Habitat identifies key areas to ensure the long-term persistence of species of conservation concern, exemplary natural communities, and intact ecosystems across the Commonwealth.
Critical Natural Landscape identifies larger landscape areas that are better able to support ecological processes, disturbances, and wide-ranging species.

Core Habitat is made up of the following 6 components:
Species of Conservation Concern includes native Massachusetts species that are listed under the state Endangered Species Act or listed in the State Wildlife Action Plan
Priority Natural Communities includes natural communities with limited distribution and the best examples documented of more common types of communities
Forest Core identifies the best examples of large, intact forests that are least impacted by roads and development, providing critical "forest interior" habitat for numerous woodland species
BioMap2 Wetlands identifies the most intact wetlands within less developed landscapes
Aquatic Core identifies core habitat for fish and other Species of Conservation Concern
Vernal Pool Core identifies the highest quality most interconnected clusters of Potential Vernal Pools and the habitat between them

Critical Natural Landscape is made up of the following 5 components:
Landscape Blocks - are large areas of high quality intact and predominately natural vegetation
Upland Buffers of Wetland Core - identifies upland areas adjacent to all Wetland Cores
Upland Buffers of Aquatic Core - identifies upland areas adjacent to all Aquatic Cores
Upland Habitat to Support Coastal Adaptation - identifies upland areas adjacent to existing salt marshes where these habitats might move to as sea levels rise
Foraging Habitat for Tern Species - identifies the offshore habitat used by MESA-listed Roseate, Arctic, Common, and Least Terns when foraging for food (see Species of Conservation Concern)

How is it similar or different from other analyses? BioMap2 combines a fine filter approach based on mapped species habitats with a coarse filter approach that incorporates ecosystems and large unfragmented areas. The Core component data layer "Species of conservation concern" incorporates species habitat maps delineated by Natural Heritage biologists for 413 MESA listed species as well as an additional 62 species of conservation concern identified by the 2005 State Wildlife Action Plan (SWAP). It is important to note that the "Species of Conservation Concern" layer, and indeed BioMap2 as a whole, is not a regulatory layer and has distinct differences from the NHESP layers such as "Prihab" that trigger regulatory review.

BioMap2 also uniquely among the datasets considered here incorporates NHESP data on natural communities. The best examples of 94 "Priority Natural Communities" were selected for inclusion, focusing on those communities with limited distribution and where field inventory identified the best examples in terms of size, condition and landscape context.

BioMap2 draws on UMass CAPS to evaluate and identify Core Habitat components "forest cores" and "wetland cores", as well as to identify "landscape blocks", large unfragmented landscapes that are critical to maintaining ecological processes.

Though BioMap2 predated the release of TNC's resilience analysis, key concepts of conservation science in understanding characteristics of resilient lands were used in its development. Those include stratifying wetland cores by geology and elevation; ensuring core and critical natural habitat were represented across the whole state, and ensuring there was redundancy among elements of biodiversity to mitigate losses in any one area.

Core habitat and Critical Natural Landscape were derived independent of protected lands status. At the time of its release, 1.2 of the 2.1 million acres identified in BioMap2 were unprotected.

How can it be applied? BioMap2 can be applied at a fine scale to guide land protection and other conservation efforts aimed at protecting biodiversity. BioMap2 is designed to be used "out of the box" to provide a straightforward, simple map of priorities that can be easily accessed by conservation practitioners.

Publicly available? Yes.
Additional resources including a summary report, technical report and town specific reports and maps are available at https://www.mass.gov/service-details/biomap2-conserving-the-biodiversity-of-massachusetts-in-a-changing-world
Online map viewer: http://maps.massgis.state.ma.us/dfg/biomap2.htm
GIS data is available for download at MassGIS

Conservation and Assessment Prioritization System (CAPS)

Author? UMass Amherst

Year released? Statewide, comprehensive results released in 2011, though earlier iterations covered portions of the state.

Geographic scope: Statewide in Massachusetts, all freshwater, coastal, and terrestrial systems

What question is it designed to answer? For every 30 meter pixel in Massachusetts, what is the ecological integrity of each ecosystem as compared to the rest of its extent within Massachusetts? CAPS defines ecological integrity as "the ability of an area to support biodiversity and the ecosystem processes necessary to sustain biodiversity over the long term".

Key data products?
Index of Ecological Integrity (IEI) is the key data product from CAPS. **Fo**r every 30 meter pixel of the state, it measures ecological integrity for a comprehensive set of ecological communities on a scale of 0 – 1. Results are scaled to either ecoregion, watershed, or an integrated scaling that combines statewide and ecoregional relative scores.

Along with the IEI, a number of intermediate data layers representing ecological settings variables and landscape metrics are distributed.

How is it similar or different from other analyses? IEI is computed as a combination of input metrics, derived from landcover and a number of ecological settings variables (e.g., wetness, flow gradient, soil depth, minimum winter temperature). Metrics assess anthropogenic stressors and resiliency.

Methods developed in CAPS have been adapted and expanded upon in other projects, for instance Critical Linkages and Designing Sustainable Landscapes. Methodology for assessing local connectivity, one component of the overall IEI score, was adapted for use in the TNC Resilience analysis.

How can it be applied? Examples?
CAPS has been a foundational analyses for many of the other datasets described here, and methods developed for CAPS have been duplicated and adapted in other analyses. In BioMap2, IEI was used to identify the most intact examples of certain ecosystems for inclusion as forest cores, wetland cores, and aquatic cores. In another example, MassDEP Wildlife Habitat Protection Guidance for Inland Wetlands (2006) used CAPS results to identify wetland habitat of potential regional or statewide importance, a way to assess wildlife habitat impacts associated with development proposals within wetlands. Because it uses a statewide, relative scoring system, IEI does not provide an "out of the box" set of priorities, rather it requires a degree of interpretation in order to use as a prioritization tool for conservation planning. Pdf maps showing IEI at the statewide and townwide level are available from the CAPS website to get a rough sense of the patterns, but to use CAPS more rigorously it must be downloaded and accessed in GIS.

Publicly available? Data can be downloaded from the UMass CAPS website, as well as PDF maps of IEI depicting the top 50% of lands with the highest ecological integrity for all cities and towns in Massachusetts. http://www.umasscaps.org/

Critical Linkages

Author? UMass Amherst/TNC

Year Released? Critical Linkages Phase I (2012; updated in 2014), Phase II (2013)

Geographic Scope: Freshwater and terrestrial systems of Massachusetts

What question is it designed to answer? Where are the places in Massachusetts changes to transportation infrastructure will provide the greatest benefit for habitat connectivity?

Key data products? Phase I results focus on the effects of infrastructure (culverts/bridges, dams, and roads) on local connectivity, movement that occurs within a local neighborhood of an organisms home range. All *road-stream crossings* and dams in the state are scored in terms of their impact on connectivity for aquatic organisms. Road segments represented in *Roads_link* measure where along a road a passage structure would most improve surrounding ecological integrity.

Phase II results focus on regional connectivity, or movement across larger distances that might occur over several generations of a population. Large, high quality habitats (*nodes*), connecting areas between nodes (*links*), and segments of roads (*linkages*) are scored for their contribution to overall connectivity of the whole network. *Conductance* is a raster map showing where pathways between nodes are most concentrated.

How is it similar or different from other analyses?

Critical Linkages is primarily concerned with connectivity, and pinpointing where interventions could bring the most gain. In contrast, Resilient and Connected Landscape and the CAPS IEI both treat connectivity as one component of a larger set of factors that contribute to overall resilience.

In Phase I, crossings, dams, and road segments are scored in terms of their "effect" or how much the connectedness of the immediate surrounding landscape would theoretically improve if a culvert was upgraded, a dam removed, or a road passage structure installed at that point.

In Phase II, results are driven by a predefined set of "nodes", which the model finds optimal routes to connect. In contrast to the way connectivity is measured in Resilient and Connected Landscapes at every pixel in the study area, Critical Linkages results are heavily determined by the node selection and measuring connectivity between nodes. Therefore, although the Critical Linkages II analysis covers the whole state, areas where nodes are sparse will show low importance for connectivity.

Critical Linkages is similar to CAPS in that it uses a coarse filter approach to capture biodiversity, and it relies on many of the same metrics and basic approach. No specific species habitat maps were used in this analyses. Rather, the analysis employs a coarse filter approach where incorporating a diversity of ecosystem types serves as a surrogate for species types. In Phase II, which measures connectivity across larger spatial and temporal scales, results are presented for 3 different dispersal distances, meant to represent different guilds of species from those such as amphibians which travel very short ranges to larger distances representing the movement range of species such as bobcat or foxes.

Elements of BioMap2 were used in creating the Phase II nodes. Nodes also incorporate highly intact protected lands as assessed by CAPS IEI.

How can it be applied? Examples?
Critical linkages can be used to help prioritize culverts for further assessment and potential upgrade. MassDOT uses Critical Linkages to help inform their culvert upgrade prioritization.

MassAudubon's MAPPR tool, described below, incorporates elements of Critical Linkages II.

The Berkshire Wildlife Linkage spatial priorities, described below, draw heavily on the Critical Linkages II products.

Publicly available? Yes, data downloads and documentation are available from the UMass CAPS website: http://www.umasscaps.org/.

Resilient and Connected Landscapes

Author? The Nature Conservancy, Eastern Conservation Science

Year Released? First released in 2012. An updated version that improves methods and expands the geographic scope was released in 2016.

Geographic Scope: Terrestrial and wetland systems of Eastern North America, covering 20 ecoregions in 22 states and 3 Canadian provinces

What question is it designed to answer? Where are the places on the landscape that will be the most resilient to climate change? Specifically, what is the set of diverse and connected places, that if conserved, will ensure that a full suite of biodiversity and healthy ecosystem processes will persist in a changing climate?

Key data products?

Resilient and Connected Landscapes (2016) combines two analyses: *Resilient Sites* and *Regional Flow*, to identify a prioritized network of resilient and connected sites that collectively covers 23% (106 million acres) of the Eastern US.

Resilient Sites are places where the direct effects of climate change are moderated by complex topography and connected natural cover.
Regional Flow identifies areas that support movement at regional and continental scales to support range shifts in a changing climate.

Inputs to *Resilient Sites* that may be of interest:
Geophysical Settings are the 62 unique groupings of elevation and geology used to stratify results.
Landscape Diversity measures the presence of characteristics (topography, elevation range, wetland density and soil variety) that create microclimates and habitat variety.
Local Connectedness measures the degree to which fragmenting features (roads, development, agriculture, etc.) impede movement within a local neighborhood.

All datasets are at a 30 meter raster resolution.

How is it similar or different from other analyses?

Like Critical Linkages II, the Regional Flow component addresses connectivity at regional scales. However it uses a different approach that identifies connections across the whole landscape, not just between predetermined habitat nodes.

Like the CAPS IEI, resilience scores are stratified in order to capture the full diversity of the study area. What's different about the stratification here is that it is across "geophysical settings", or unique combinations of elevation and bedrock, whereas CAPS is stratified by existing ecosystems like shrub swamps or bogs. The idea behind the geophysical settings is that ecosystem type may change over time as the climate changes, but a network that includes a diverse range of geomorphic settings will result in a diversity of ecosystems, even as those ecosystem types may shift and rearrange themselves across the landscape. The result is to emphasize the importance of local microclimates to buffer climate change.

7

Management status of lands (i.e., whether they are protected or not) does not factor into the resilience scores. However, an overlay of the "resilient and connected lands" with secured lands can be viewed at TNC's Conservation Gateway site, listed below.

How can it be applied? Examples?
 "Conserving Nature in a Changing Climate", a guide for conservation practitioners to using these data, among others, has been prepared by OSI and partners and is available on the Land Trust Alliance website.   http://climatechange.lta.org/. This guide walks the reader through a step by step process to use selected data products from the TNC resilience and Designing Sustainable Landscapes initiatives to develop land protection plans that incorporate climate resilience.

In Massachusetts, groups such as the Quabbin Regional Landscape Partnership have used resilience in developing conservation priorities (http://climatechange.lta.org/case-study/geospatial-tools-build-resilience/)

Publicly available? Yes. Data**,** reports, an online maps are available at the Conservation Gateway, http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/Pages/default.aspx

Designing Sustainable Landscapes (DSL)

Author? UMass Amherst

Year Released? Initial pilot was released in 2012; ongoing releases of various products since then; current version was released in 2017.

Geographic Scope: 13 states in the Northeast.

What question is it designed to answer? Designing Sustainable Landscapes, a project of the North Atlantic Landscape Conservation Cooperative (NALCC), is designed to inform landscape-scale conservation throughout the Northeast, with a focus on ecological integrity, habitat for representative wildlife species, and a conservation reserve design.

Key data products?

Ecological integrity (IEI). Assessment of ecological integrity for each 30 m cell, scaled by ecological system for the region, states, ecoregions, and HUC6 watersheds.

Habitat for representative species. Habitat capability models for 30 representative wildlife species and climate response models given expected climate change through 2080.

Landscape conservation design. A system of proposed conservation cores and connectors throughout the Northeast (part of the North Atlantic LCC's Nature's Network), as well as a number of ancillary products and several alternative core networks.

Critical Linkages. Prioritization of road-stream crossings and dams for potential upgrade/removal based on the potential improvement in aquatic connectedness.

Assessment of the effects of urban growth and climate change. DSL includes an urban growth model, and is linked to climate change and sea level rise models. These landscape change models allow us to assess ecological integrity and habitat capability for representative species under various future scenarios. Ongoing work assesses the effect of various potential land conservation schemes on future landscapes.

How is it similar or different from other analyses?

The ecological integrity and Critical Linkages components of DSL use the same methodology as the Massachusetts CAPS and Critical Linkages analyses, though there are differences necessitated by the use of regional data. Several metrics available in the Massachusetts analysis were dropped because of data limitations. The representative species habitat models differ from the other analyses listed here, in that they focus on particular representative species, though the habitat models still represent a coarse filter approach. The landscape conservation design (Nature's Network and several alternative designs) share goals with BioMap 2, and share some methodology (the use of IEI), but differ significantly in their approaches. The future assessments are unique. All DSL products are available for the 13-state region, facilitating conservation planning across state borders.

How can it be applied? Examples?

Results may be used to help prioritize land for conservation, help inform management of particular species, prioritize assessment of culverts and dams, and understand the effects of

various land conservation strategies. See http://www.naturesnetwork.org/testimonials/ for some examples of how DSL/Nature's Network is being used.

Publicly available? Yes, data and extensive documentation are available at http://www.umass.edu/landeco/research/dsl/dsl.html and http://www.naturesnetwork.org/.

Conservation initiatives that use these data

Berkshire Wildlife Linkage

The Berkshire Wildlife Linkage, a member of the Staying Connected Initiative, is a partnership led by The Nature Conservancy that brings together land trusts and state agencies working together to promote habitat connectivity in the Berkshires.

Author? TNC

Year Released? 2015 (Massachusetts)

Geographic Scope: Western Mass and neighboring portions of CT, NY, and VT

What question is it designed to answer? The Berkshire Wildlife Linkage has defined spatial priorities that answer the question, Where are the most strategic places to focus efforts to restore and maintain habitat connectivity within the Berkshires and linking the Hudson Highlands to the southern Green Mountains?

Key data products?

Priority Connectivity Areas represent zones between nodes that are most critical for maintaining connectivity across the Berkshire Linkage

Priority Road Segments represent priorities for barrier mitigation such as wildlife crossing structures.

Habitat Nodes represent places of large (above 500 acre) intact habitat blocks spanning forest, wetlands, and aquatic ecosystems. They were adopted directly from the Critical Linkages II nodes.

Conductance_Zones_10K Conductance is a measure of the probability of movement between nodes. This layer presents one way to classify and display the 10K conductance grid from Critical Linkages II. In this version, the conductance grid was clipped to the Berkshire Wildlife Linkage boundary. Values were log transformed and displayed by quartile.

Berkshire Wildlife Linkage boundary The linkage boundary encompasses a broad area of relatively permeable landscape linking the Green Mountains to the Hudson Highlands. The boundary is based upon the EPA Northeastern Highlands ecoregion, and incorporates forest matrix blocks as identified in TNC's Lower New England Ecoregional Plan. Local connectivity scores from TNC's Resilience analysis (version 2012) were also used to determine the linkage boundary in the New York and Connecticut portions.

How is it similar or different from other analyses? This analysis integrates existing key datasets including those produced by the UMass Critical Linkages Phase II and TNC's regional terrestrial resilience analysis. In particular, the analysis draws heavily on the linkage, link, and node importance metrics from Critical Linkages II.

Existing protected lands were not used to determine any of the data products with the exception of habitat nodes.

How can it be applied? Examples?

Spatial priorities are being used to direct due diligence funding through a grant administered by The Nature Conservancy. Priority Road Segments are being used to screen future DOT infrastructure projects and to focus further information gathering about animal movement.

Publicly available? Yes,

11

Data can be viewed via DataBasin, a free interactive mapping platform, at
http://bit.do/linkagemap
GIS datasets are available upon request from The Nature Conservancy (Jessica.dietrich@tnc.org)
More information about the Berkshire Wildlife Linkage is available at the Staying Connected Initiative's
website at http://stayingconnectedinitiative.org/our-places/greens-to-hudson-linkage/

BRNC High Road Initiative

Author? Berkshire Natural Resources Council
Year Released? 2018 (in development)
Geographic scope: Berkshire county
What question is it designed to answer? What are available walking routes in the Berkshires. These will
include routes from town to town, that incorporate trails, roads, wood roads and sidewalks as well as
out-and-back hiking trails. Linear routes between towns will likely include multiple owners/managers.
Key data products? TBD
How is it similar or different from other analyses? It is different than other trail data sets as it is
designed to link paths from town to town, regardless of owner. It will include difficulty rating and other
trail information. It is more focused on linking people from town to town with the secondary effect of
linking habitat and conserved areas.
How can it be applied? Examples? BNRC is currently making an app, data availability is TBD and will
depend on partners.
Publicly available? Yes, subject to partner agreements.

Key Sites

The Biodiversity Initiative (BDI) brings together Restoration Ecologists, Wildlife Biologists and Foresters
from the DFW Natural Heritage & Endangered Species Program and the DFW Habitat Program to focus
on active management designed to directly benefit rare and declining wildlife species and plant
communities. Both uplands (especially open grasslands and fire-adapted pitch pine/scrub oak
shrublands) and wetlands (like fragile calcareous wetlands threatened by invasive plants) are treated
under the BDI. Primarily, the BDI focuses on habitats that have suffered from either direct losses from
human development and/or from human alteration of natural disturbance processes (e.g. flooding, fires,
etc.).

In 2013, the NHESP developed the BDI Key Sites project to delineate high-priority biodiversity areas (Key
Sites) across the state. The Key Sites project uses BioMap2 data (and updated NHESP data) to identify
high-priority sites that meet one or more of these three criteria: 1) Rare species "hotspots" - Sites with a
concentration of co-occurring rare species listed under the Massachusetts Endangered Species Act
(MESA), 2) Sites with the best quality occurrences of high-priority species or natural communities (e.g.,
globally rare species), and 3) Multiple, co-occurring, landscape-level resources, as identified by BioMap2

Source: http://www.mass.gov/eea/agencies/dfg/dfw/wildlife-habitat-conservation/key-sites-protecting-
our-investment-in-public-land.html

Connect the Connecticut

This is a collaborative effort to develop a landscape conservation design for the Connecticut River watershed - an innovative approach using the best available science to identify priority areas for conservation to ensure that important species, habitats, and natural processes will be sustained into the future. With support from the North Atlantic Landscape Conservation Cooperative, partners in Vermont, New Hampshire, Connecticut, and Massachusetts, representing more than 20 agencies and organizations worked together with the modeling team from the Designing Sustainable Landscapes Project at UMass Amherst to develop the design.

Nature's Network, described below, drew on lessons learned from Connect the Connecticut, and incorporates many of the same datasets scaled to the region rather than the watershed.

Data, tools, and supporting resources at http://connecttheconnecticut.org/

Regional Conservation Opportunity Areas (RCOA's), or "Nature's Network"

Nature's Network is a collaborative effort facilitated by the North Atlantic Landscape Conservation Cooperative that brings together partners from 13 states, the U.S. Fish and Wildlife Service, nongovernmental organizations, and universities to identify the best opportunities for conserving and connecting intact habitats and ecosystems and supporting imperiled species to help ensure the future of fish and wildlife across the Northeast region.

What began as "Regional Conservation Opportunity Areas" evolved to be renamed as Nature's Network. The Network refers to a set of tools and data as well as the partnership. More information can be found at http://www.naturesnetwork.org/

Nature's Network Conservation Design represents a combination of three Nature's Network products: 1) the terrestrial core-connector network, 2) aquatic core areas, and 3) core habitat for imperiled species.

Which datasets to use when?

Where are strategic places to do land protection to protect biodiversity?

> Though all of these datasets point to places important for maintaining biodiversity, BioMap2 provides the finest scale data of this list for this application. If you are interested in particular aspects of biodiversity, look at the individual components of Core Habitat (vernal pools, natural communities, species of conservation concern, etc).

Where are strategic places to do a land protection project that will enhance connectivity?

> In Western Mass, the BWL Priority Connectivity Areas are designed to provide a simplified answer this question. If you are looking at a statewide scale or a different geography or if you want to delve deeper into the nuances of the data, consult Critical Linkages results in particular link importance scores. For a parcel based analysis, you can use the MAPPR tool (described below).

Where are strategic places to mitigate road barriers that will enhance connectivity for wildlife movement?

> In Western Mass, BWL Priority Road Segments are designed to provide a simplified answer this question. If you want to delve more into the data, or look statewide, consult Critical Linkages Phase I "road_link" data and Critical Linkages Phase II "linkages" datasets.

Which areas are most likely to support animal movement?

> Critical Linkages Phase II Links, Conductance
> TNC Regional flow

Evaluating how a place ranks on a regional or continental scale in terms of climate resilience

> The tools available through Nature's Network, as well as the guidebook "Conserving Nature in a Changing Climate", are designed to make the multi-state, regional datasets described here (TNC Resilient and Connected Landscapes and Designing Sustainable Landscapes) easily accessible and to help the user interpret them. The Resilient Lands Mapping Tool on the TNC Conservation Gateway site is a useful tool for specifically exploring the TNC Resilient and Connected Landscapes datasets and allows the user to generate statistics for a user – specified parcel or area of interest based on an uploaded shapefile or screen-digitized shape.

Which grant programs use these data?

Note – this list is not comprehensive and may change as grant opportunities come and go (October 2017)

- EEA Landscape Partnership Grant, EEA LAND Grant, and EEA Conservation Partnership Grant
- Berkshire Wildlife Linkage Catalyst Fund (due diligence grant)
- MA Conservation Tax Credit
- Open Space Institute Northeast Resilient Landscapes Fund

Useful tools for accessing these data (integrate multiple datasets)

MassAudubon MAPPR Tool: Combines TNC Resilience, Critical Linkages, BioMap2 and other datasets to rank landowner parcels according to user- defined weightings in a given geography (town, watershed, or regional land trust focus area). https://www.massaudubon.org/our-conservation-work/advocacy/shaping-the-future-of-your-community/current-projects/mappr-project

Conserving Nature in a Changing Climate: A workbook developed by the Open Space Institute and the Land Trust Alliance in partnership with the North Atlantic Landscape Conservation Collaborative. The workbook is designed to help land trusts and other conservation organizations gain the knowledge and tools to fulfill their critical missions, even in the face of so many unknowns. An interactive map gallery can be freely accessed at https://nalcc.databasin.org/galleries/69d5ce3a5c35433cb8a550d5317c8213 to view the datasets discussed in the workbook and help land trusts identify climate resilient sites.

North Atlantic LCC Conservation Planning Atlas https://nalcc.databasin.org/

MassGIS OLIVER View the BioMap2 layers, in conjunction with many other Massachusetts state – specific regulatory, land use, administrative, and natural resource datasets in a publicly accessible interactive mapping platform http://maps.massgis.state.ma.us/map_ol/oliver.php