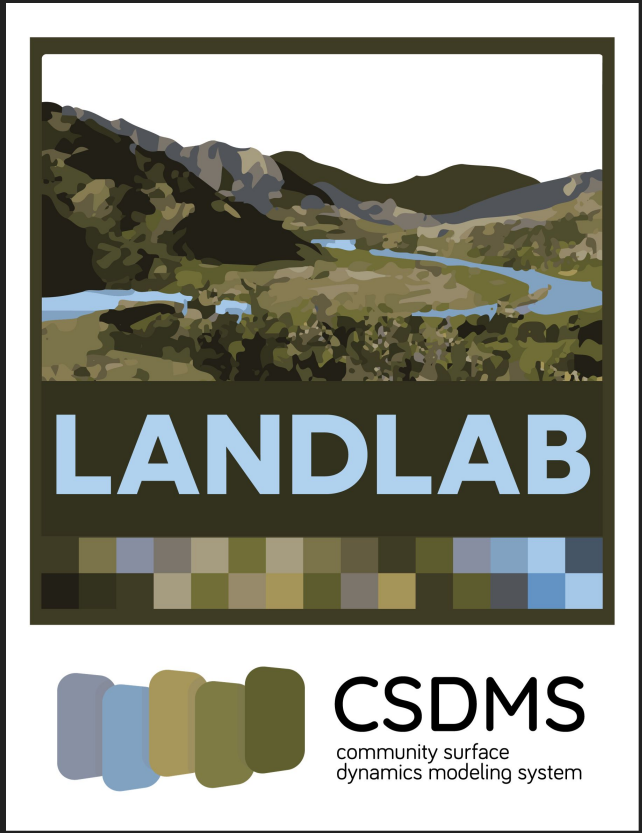
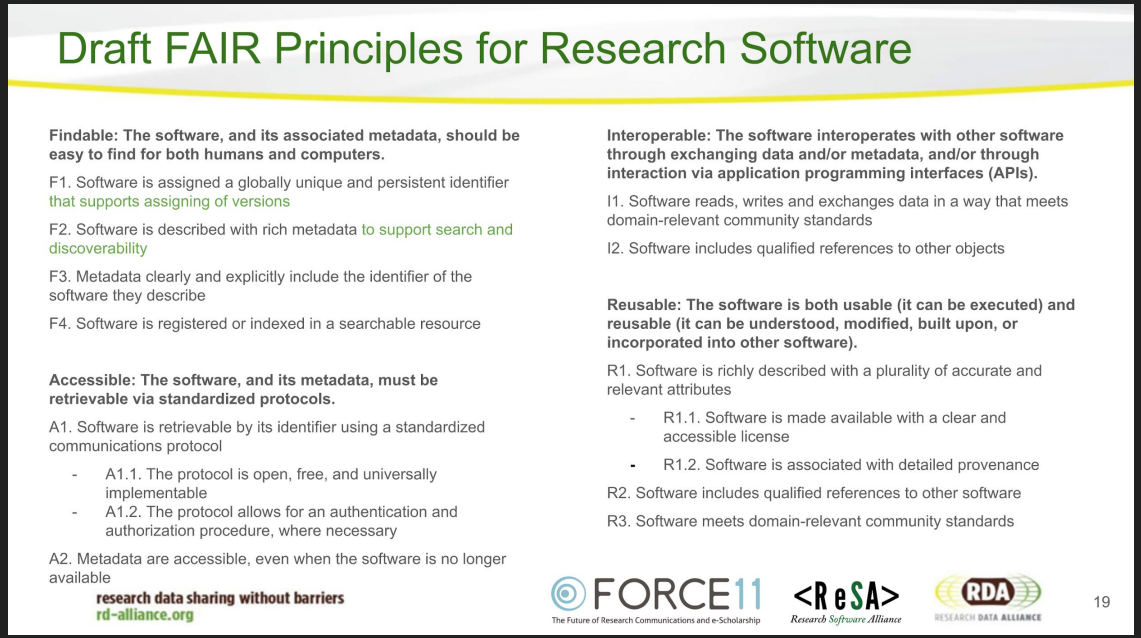
How FAIR is Landlab?

Landlab (landlab.github.io) is a Python-based modeling environment that allows scientists and students to build numerical landscape models.

Designed to quantify earth surface dynamics, it can also be used for any application that needs 2D grid-based numerical models.

Can we score Landlab on FAIR research software principles?





Research Software Alliance (ReSA): https://www.researchsoft.org/news/2021-04

Lamprecht, Anna-Lena, et al., 2020: Towards FAIR principles for research software. *Data Science* 3(1), 37-59, doi: 10.3233/DS-190026

Findable

The software, and its associated metadata, should be easy to find for both humans and computers.

		Landlab	
F1	Software is assigned a globally unique and persistent identifier that supports assigning of versions	?	?
F2	Software is described with rich metadata to support search and discoverability	?	?
F3	Metadata clearly and explicitly include the identifier of the software they describe	?	?
F4	Software is registered or indexed in a searchable resource	?	?

Findable

The software, and its associated metadata, should be easy to find for both humans and computers.

		Landlab	
F1	Software is assigned a globally unique and persistent identifier that supports assigning of versions	✔	Incrementable DOI through Zenodo
F2	Software is described with rich metadata to support search and discoverability	✔	Metadata in GitHub repo README and Read the Docs documentation
F3	Metadata clearly and explicitly include the identifier of the software they describe	—	README badge
F4	Software is registered or indexed in a searchable resource	✔	Indexed in OpenAIRE and CSDMS Model Repository

Accessible

The software, and its associated metadata, must be retrievable via standardized protocols.

		Landlab	
A1	Software is retrievable by its identifier using a standardized communications protocol	?	?
A1.1	The protocol is open, free, and universally implementable	?	?
A1.2	The protocol allows for an authentication and authorization procedure, where necessary	?	?
A2	Metadata are accessible, even when the software is no longer available	?	?

Accessible

The software, and its associated metadata, must be retrievable via standardized protocols.

		Landlab	
A1	Software is retrievable by its identifier using a standardized communications protocol	✔	DOI has a Zenodo URL with link to source
A1.1	The protocol is open, free, and universally implementable	✔	HTTPS
A1.2	The protocol allows for an authentication and authorization procedure, where necessary	✔	Zenodo, GitHub
A2	Metadata are accessible, even when the software is no longer available	✔	Zenodo (20 yr promise)

Interoperable

The software interoperates with other software through exchanging data and/or metadata, and/or through interaction via application programming interfaces (APIs).

		Landlab	
I1	Software reads, writes, and exchanges data in a way that meets domain-relevant community standards	?	?
I2	Software includes qualified references to other objects	?	?

Interoperable

The software interoperates with other software through exchanging data and/or metadata, and/or through interaction via application programming interfaces (APIs).

		Landlab	
I1	Software reads, writes, and exchanges data in a way that meets domain-relevant community standards	✔	Python; numpy and xarray; netCDF
I2	Software includes qualified references to other objects	—	Requirements files; pip and conda

Reproducible

The software is both usable (it can be executed) and reusable (it can be understood, modified, built upon, or incorporated into other software).

		Landlab	
R1	Software is richly described with a plurality of accurate and relevant attributes	?	?
R1.1	Software is associated with a clear and accessible license	?	?
R1.2	Software is associated with detailed provenance	?	?
R2	Software includes qualified references to other software	?	?
R3	Software meets domain-relevant community standards	?	?

Reproducible

The software is both usable (it can be executed) and reusable (it can be understood, modified, built upon, or incorporated into other software).

		Landlab	
R1	Software is richly described with a plurality of accurate and relevant attributes	✔	Documentation, examples, component-based extensions
R1.1	Software is associated with a clear and accessible license	✔	MIT License
R1.2	Software is associated with detailed provenance	✔	GitHub history, citation information
R2	Software includes qualified references to other software	✔	Refs to xarray, CF, netCDF in docs
R3	Software meets domain-relevant community standards	✔	JOSS articles; flake8, black

Landlab: it's FAIR software!