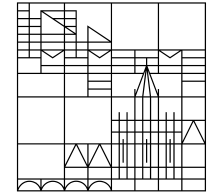




MAX-PLANCK-GESELLSCHAFT

Universität
Konstanz



Movebank, Movebank Data Repository und Movebank 2.0



Berthold & Kaatz, 2011.
Movebank ID 446651

Gabriel Schneider & Dr. Elisabeth Böker

Potsdam, 25.02.20, RDA DE Tagung 2020



Gabriel Schneider und Elisabeth Böker
/ CC BY 4.0 International



MaxPlanckSociety, 2018
<https://www.youtube.com/watch?v=RRq-panAKME;>
Abgerufen am 25.03.20

Agenda

- **Was ist Movebank?**
- **Ethische & rechtliche Aspekte**
- **Daten & Metadaten**
- **Arbeiten mit Movebank**
- **Movebank Data Repository**
- **Movebank 2.0**
- **Kooperationsmöglichkeiten für Infrastruktureinrichtungen**

Was ist Movebank?



Was ist Movebank?

- Globale Datenbank für Tierbewegungsdaten
- Werkzeug zur Arbeit an den Daten während des gesamten Forschungsprozess
- Projektbeginn im Jahr 2007

Tierbewegungsdaten

- **Tierwanderungen als Ausdruck auf sich verändernde Umweltbedingungen**
- **Tiere als „Ökosystemdienstleister“**
 - Bestäubung, Schädlingsvernichtung etc.
- **Schwarmverhalten**
- **Aber auch:**
 - Verbreitung von Krankheitserregern
 - Bevölkerungszuwachs → Nähe von Menschen und Wildtieren

Aktuelle & ehemalige Geldgeber & Institutionen



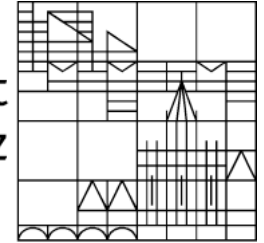
MAX-PLANCK-GESELLSCHAFT



Baden-Württemberg

MINISTERIUM FÜR WISSENSCHAFT, FORSCHUNG UND KUNST

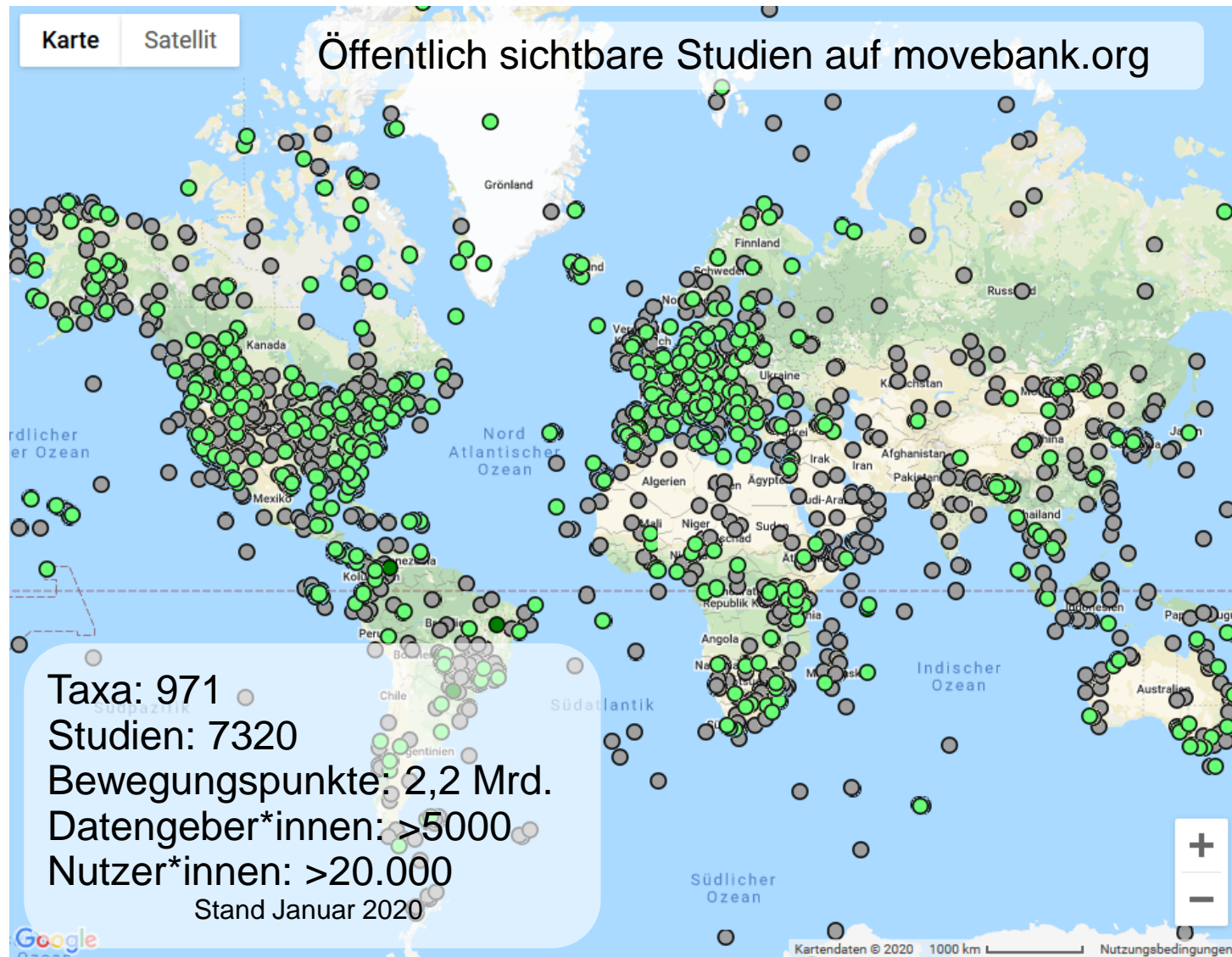
Universität
Konstanz



DFG Deutsche
Forschungsgemeinschaft



Zahlen & Fakten



Visualisierung öffentlich zugänglicher Daten (2016)



Movebank, 2017

<https://youtu.be/nUKh0fr1Od8>; Abgerufen am 25.03.2020

Ethische & rechtliche Aspekte

Ethische Aspekte

- **Live-Daten können Aufenthaltsorte von gefährdeten Tierarten öffentlich machen**
 - z.B. Nashörner, Wölfe, Schwarzstörche
- **Wilderer können diese Informationen ausnutzen**



Bewegungsdaten in Movebank – Rechtmanagement

- Zugriff auf Daten in Movebank kann reguliert werden
- Drei Rollen
 - Data Manager (Schreib- & Leserechte)
 - Collaborators (Leserechte)
 - Public

Permissions

Visibility of study name and summary

Default visibility of tracking data

It is possible to override the visibility of tracking data at the level of individual animals. Here you can undo all settings done on individual animals:

Reset visibility of tracking data to default

You may allow users to see your tracking data on a map, but restrict their ability to download data, e.g. in Excel, csv or kml format.

Restrict data downloads to

Users downloading your data for the first time, are prompted to accept the license terms. For some external applications this feature is not desirable and may therefore be disabled.

Prompt users to accept license terms?

Bewegungsdaten in Movebank - Rechtemanagement

- Studie kann mit Lizenz versehen werden

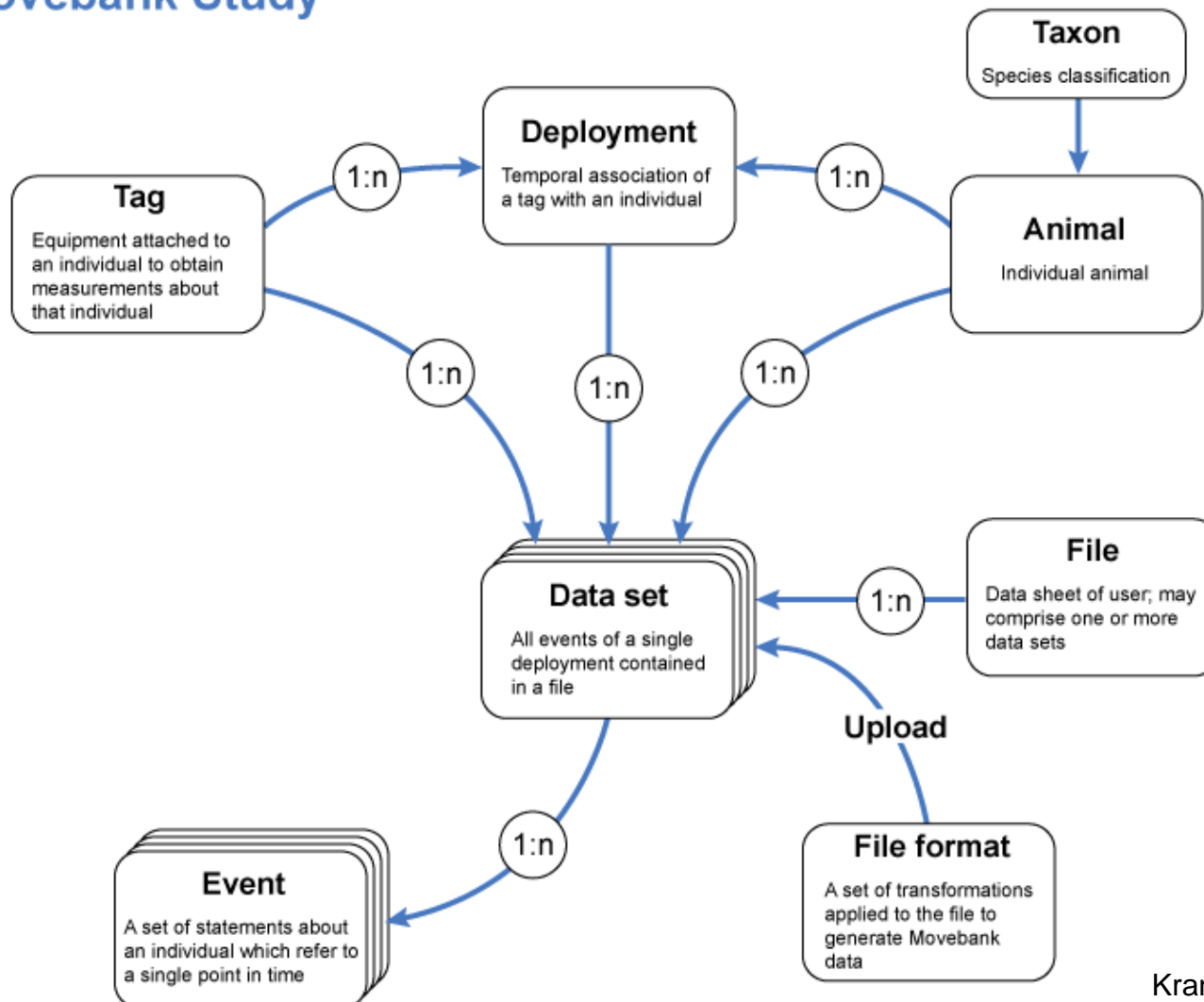
Study Details	
Study Name	Tsavo Lion Study
Contact Person	Brucepattersonius (Bruce Patterson)
Principal Investigator	Brucepattersonius (Bruce Patterson)
Citation	unpublished
Acknowledgements	Samuel Kasiki, Roland Kays, Alex Mwazo
Grants used	Earthwatch Institute (#5123)
License Terms	Data may be used for any academic purpose as long as you share any products, reports, or papers with Bruce Patterson bpatterson@fieldmuseum.org
Study Summary	Study the movement of lions in a natural area used by wildlife and cattle.
Study Reference Location	
Longitude	38.871
Latitude	-3.789
Movebank ID	220229
Study Statistics	Last Update > 1 year ago
Number of Animals	3
Number of Tags	4
Number of Deployments	3
Time of First Deployed Location	2002-04-27 22:04:00.000
Time of Last Deployed Location	2007-07-21 00:01:58.000
Taxa	Panthera leo
Number of Deployed Locations	2154
Number of Records	Deployed (outliers) / Total (outliers)
GPS	2154 (0) / 3619 (0)

Patterson B., 2007.
Movebank ID: 220229

Daten & Metadaten

Datenstruktur

Movebank Study



Kranstauber et al., 2011

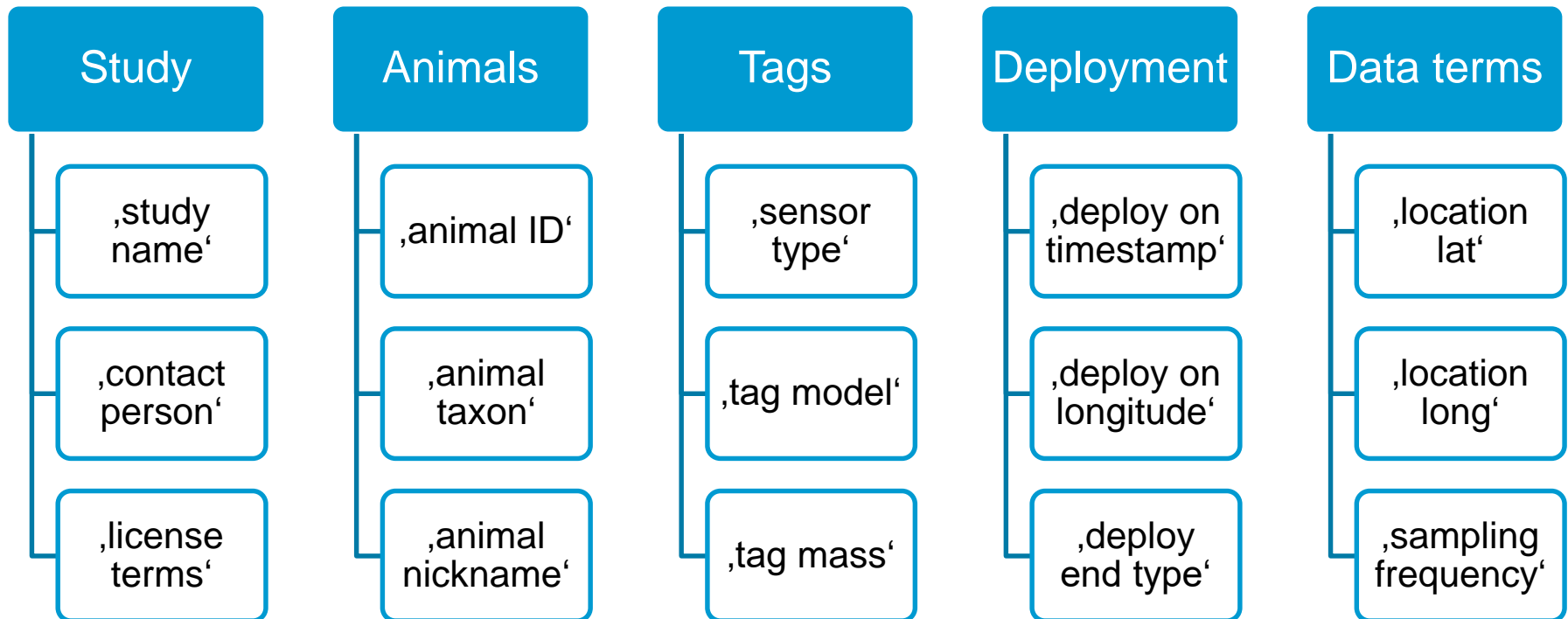
<https://www.movebank.org/cms/movebank-content/mb-data-model/>; Abgerufen am 25.03.2020

Metadaten

- Movebank Attribute Dictionary
- Attribute zu den verschiedenen Klassen des Datenschemas
- Vokabular persistent veröffentlicht unter:

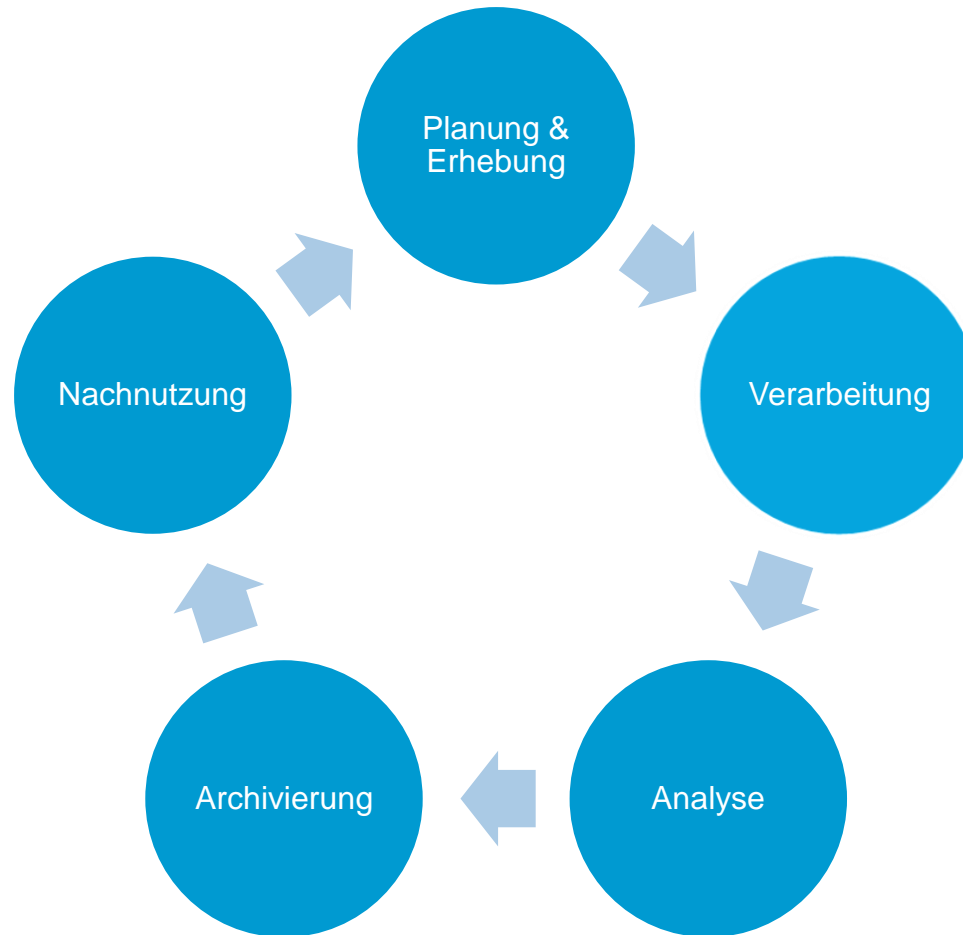
<http://vocab.nerc.ac.uk/collection/MVB/current/>

Movebank Attribute Dictionary



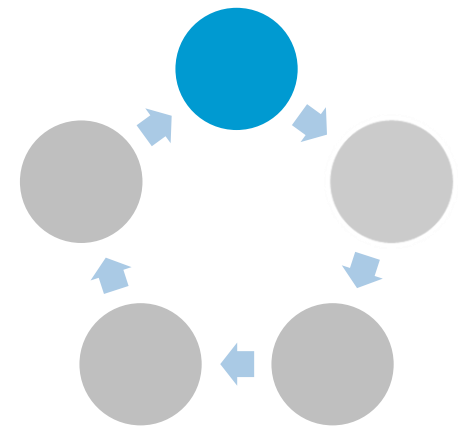
Arbeiten mit Movebank

Arbeiten mit Movebank

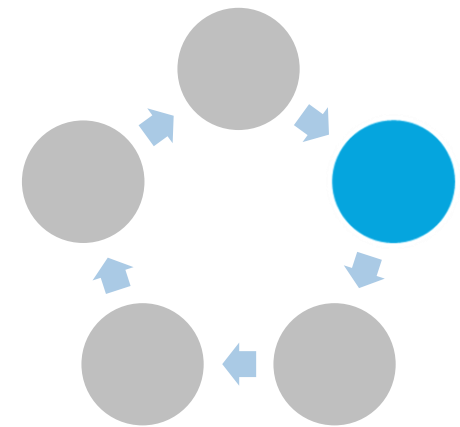


Planung & Erhebung

- **Tiere werden im Feld eingesammelt**
- **Anschließend werden sie mit Sensoren ausgestattet**
 - Wahl des Sensors
 - Unterschiedliche Technologien
 - Unterschiedliche Größe & Gewicht
- **Tiere werden frei gelassen und die Daten übertragen**
- **Sensoren müssen**
 - Daten über weite Distanzen senden
 - unter schwierigen Bedingungen funktionieren



Verarbeitung - Ingest

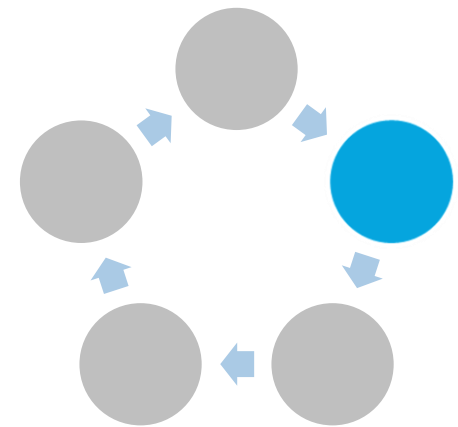


- Ingest von Daten ins System auf zwei Wegen
- Import von csv/tsv-Dateien
 - Konversion in Movebank kompatibles Schema

```
Animal,Date,Time,Latitude,Longitude
40378,31.10.03,11:26:58,14.429,31.745
40378,31.10.03,13:06:09,13.910,31.585
40378,31.10.03,16:14:24,12.964,32.032
40378,31.10.03,16:25:19,12.981,32.068
40378,01.11.03,20:12:50,10.517,33.375
40378,01.11.03,20:45:56,10.523,33.376
40378,03.11.03,04:02:41,9.179,34.095
40378,03.11.03,06:23:28,9.003,33.956
40378,03.11.03,07:16:52,8.677,34.240
```

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data>; Abgerufen am 25.03.2020

Verarbeitung - Datenkonversion



Add Column to Import

Movebank attribute:
Timestamp

Select date/time column(s) Format string

Date MM/dd/yy

Time EST HH:mm:ss

Fixed offset from UTC

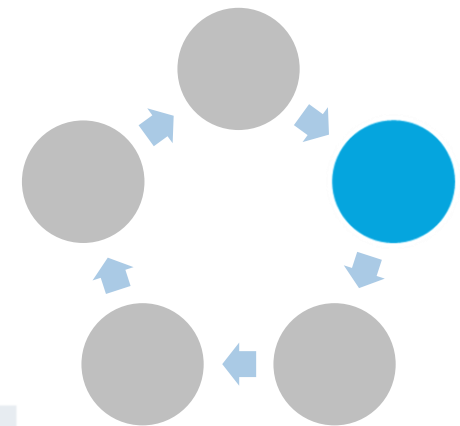
Local time zone, e.g. "PST" or "Brazil/East"

Timezone name: EST

Save Validate Remove Cancel

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data>;
Abgerufen am 25.03.20

Bewegungsdaten in Movebank - Ingest



Add Column to Import

Movebank attribute:
Location

Geodetic system

Datum: WGS 84

Projection: Long/Lat

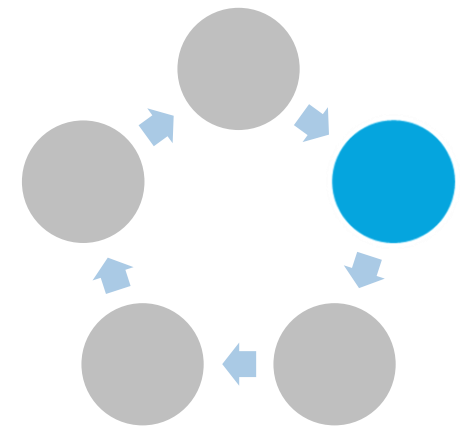
	Column	Format
Latitude	Latitude	+/-decimal
Longitude	Longitude	+/-decimal

swap sign

Save Validate Remove Cancel

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data>;
Abgerufen am 25.03.20

Verarbeitung - Datenkonversion



Add Column to Import

Movebank attribute:
Animal/Tag

All rows belong to the same Animal/Tag

Select Tag Create new

Enter unique name/id #432346

Select Animal Create new

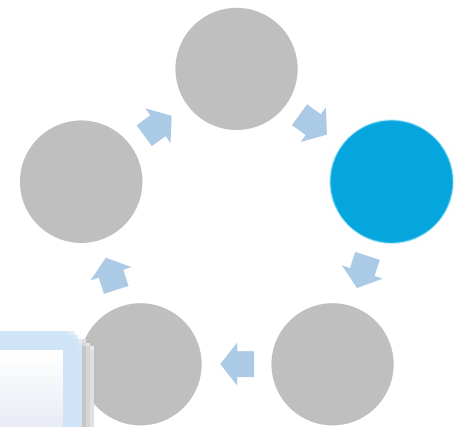
Enter unique name/id 36

Enter species Canis latrans

Save Validate Remove Cancel

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data>;
Abgerufen am 25.03.20

Verarbeitung - Datenkonversion



Edit Attribute Mapping

Movebank attribute:

Sensor Type

Set fixed Sensor Type for all rows

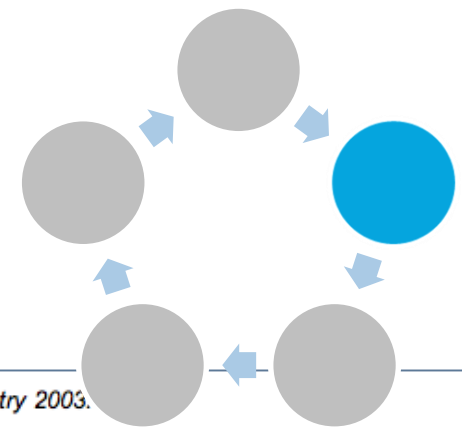
Set value

Radio Transmitter

Save Validate Remove Cancel

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data;>
Abgerufen am 25.03.20

Verarbeitung - Datenkonversion



Any errors will appear under this tab.

Messages Outline Map

File: C:\fakepath\coyote telemetry 2003.
 Format: New
 Type of data: Tracking data
 Upload channel: VHF

Columns that have been mapped to Movebank are highlighted in blue.

What Movebank sees in your file (Click header to import column into Movebank):

Date	Time EST	Longitude	Latitude	Behavior	Animal ID	Tag No	UTM East	UTM North
4/7/01	5:01:00	-73.89664208	42.70802103	A	1	#432290	590358	4726
4/9/01	5:03:00	-73.89310097	42.70664506	A	1	#432290	590650	4726
4/10/01	7:30:00	-73.8913998	42.71372486	A	1	#432290	590779	4726
4/11/01	13:50:00	-73.89179687	42.70582196	A	1	#432290	590758	4726
4/12/01	13:55:00	-73.89065858	42.71008851	A	1	#432290	590845	4726
4/12/01	17:40:00	-73.8926276	42.7071718	I	1	#432290	590688	4726

Mappings:
Location
Timestamp
Animal/Tag
Sensor Type
Behavioural Classification
Comments

A list of all the attributes that have been mapped to the Movebank format and will be imported to Movebank.

Map other Attributes

To highlight and compare values between tables, click on the values within a column from either preview table.

How Movebank will save the data:

Location Lat	Location Long	Timestamp	Animal Id	Tag Id	Sensor Type
42.70802103	-73.89664208	2001-04-07 10:01:00	1	#432290	Radio Transm
42.70664506	-73.89310097	2001-04-09 10:03:00	1	#432290	Radio Transm
42.71372486	-73.8913998	2001-04-10 12:30:00	1	#432290	Radio Transm
42.70582196	-73.89179687	2001-04-11 18:50:00	1	#432290	Radio Transm
42.71008851	-73.89065858	2001-04-12 18:55:00	1	#432290	Radio Transm
42.7071718	-73.8926276	2001-04-12 22:40:00	1	#432290	Radio Transm

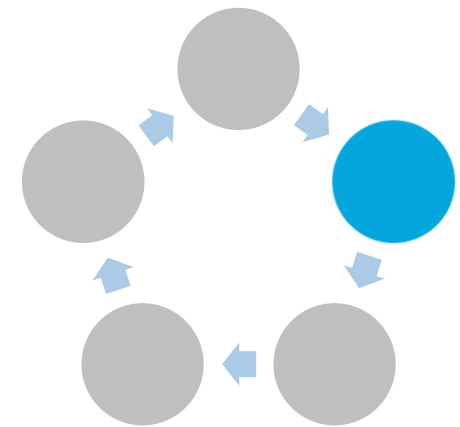
To re-open the import options and make changes, select a column heading from either preview table.

Use the scroll bars to view all attributes in the preview tables.

Finish Cancel

<https://www.movebank.org/cms/movebank-content/import-custom-tabular-data;>
 Abgerufen am 25.03.20

Verarbeitung – Verwendung von Live-Daten



- Direkte Übertragung von Senderdaten nach Movebank
- Unterstützte Technologien:

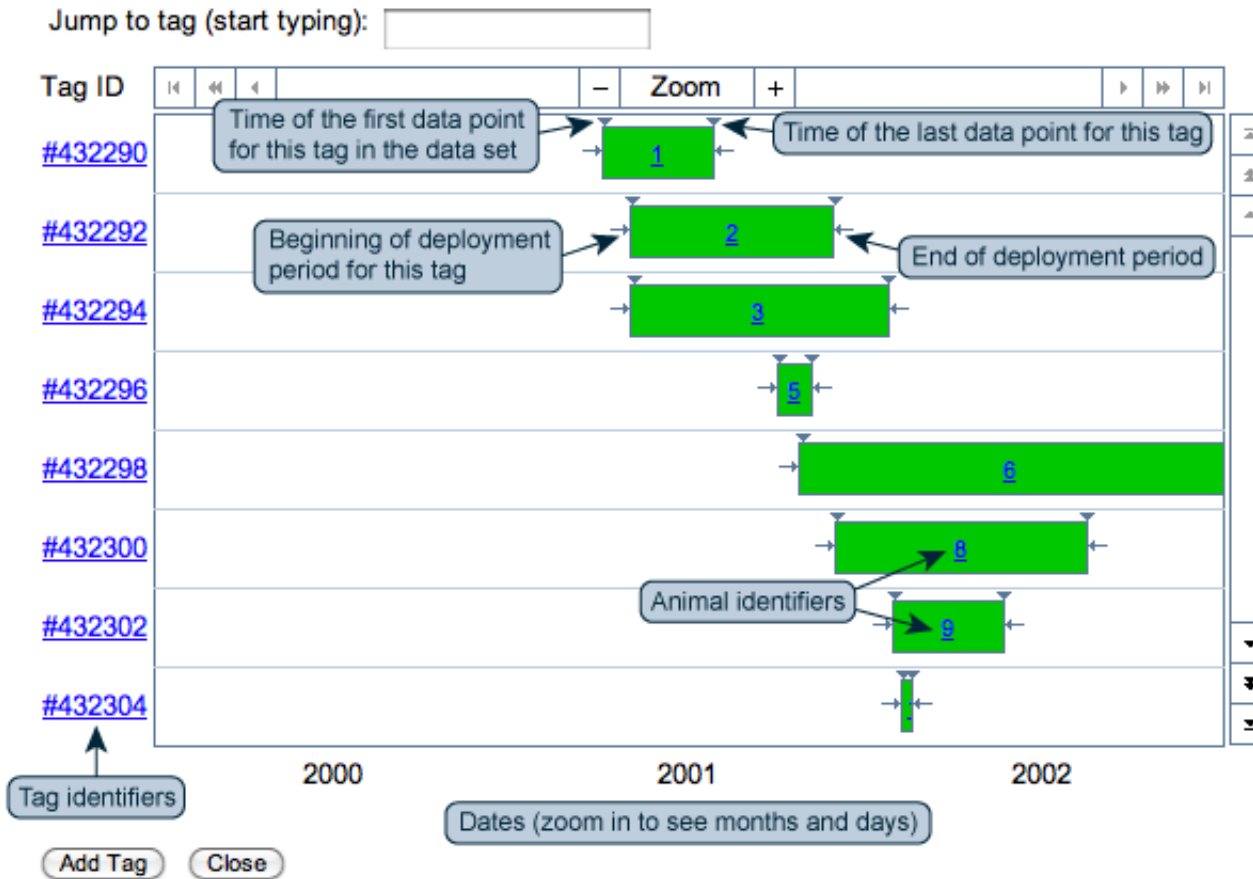
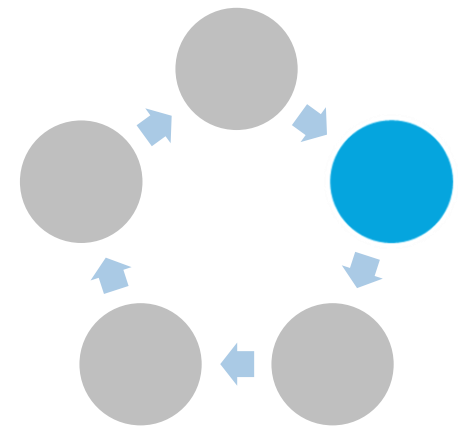
Argos

GSM-
GPS

Iridium-
GPS

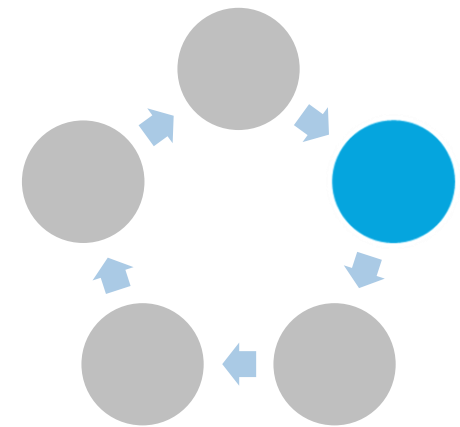
ICARUS

Verarbeitung – Deployment Manager



<https://www.movebank.org/cms/movebank-content/deployment-manager;>
Abgerufen am 25.03.20

Verarbeitung – Deployment Manager



#432300
#432
#432

- Tag #432300
- Add animal
- Remove Tag
- Edit Tag

Edit Deployment

?
Animal

Tag

Start of tag deployment

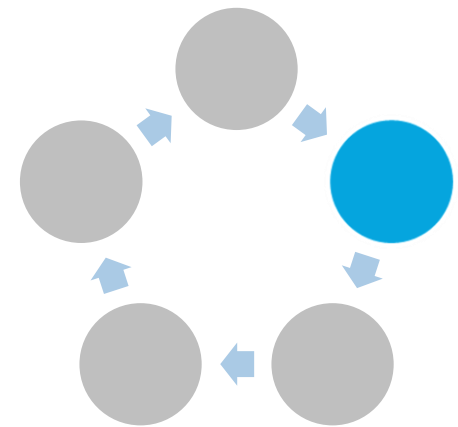
End of tag deployment

Deployment Id

Comments

<https://www.movebank.org/cms/movebank-content/deployment-manager;>
Abgerufen am 25.03.20

Verarbeitung – Deployment Manager

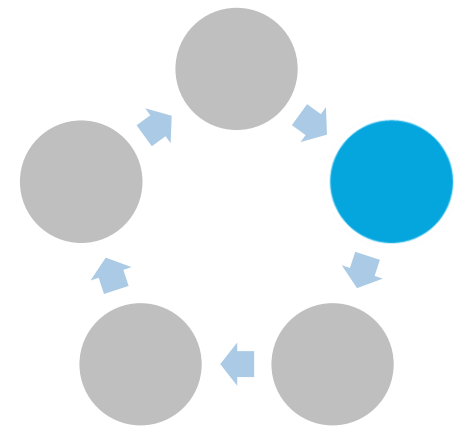


Edit Animal

Taxon	<input type="text" value="Canis latrans"/>	?
Taxon Detail	<input type="text"/>	?
Sex	<input type="text" value="Male"/>	
Animal Id	<input type="text" value="Omega"/>	?
Exact Date of Birth	<input type="text"/>	
Earliest Date Born	<input type="text"/>	
Latest Date Born	<input type="text"/>	
Comments	<input type="text"/>	
Death Comments	<input type="text" value="missing; body not recovered"/>	(27/50000)

<https://www.movebank.org/cms/movebank-content/deployment-manager;>
Abgerufen am 25.03.20

Verarbeitung – Deployment Manager



Edit Tag

Sensor Types

Manufacturer Name

Model

Serial Number

Weight in grams

Tag Id

Comments (18/50000)

Tag Failure Comments

Processing Type

<https://www.movebank.org/cms/movebank-content/deployment-manager;>
Abgerufen am 25.03.20

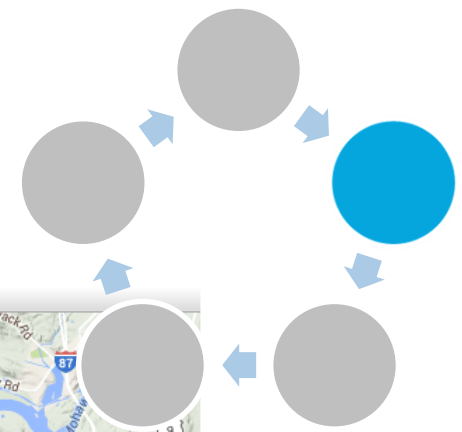
Verarbeitung – Event Editor

Add attributes to or delete attributes from your dataset.
 Manage Attributes | Map | Help | Filter Data | Run data filters.
 Map zoom options.
 Study: Coyotes, Kays and Bogan, Albany NY
 Sensor Type: Radio Transmitter
 Display Options: Hide outliers, hide undeployed records, or restrict visible data to a specific time period.
 Change which columns are visible in the data table.
 Show/Hide Columns

Timestamp	Location Lat	Location Long	Behavioural Classification
2003-08-19 21:55:00	42.699	-73.863	
2003-08-22 01:40:00	42.700	-73.866	A
2003-08-22 05:25:00	42.701	-73.866	
2003-08-29 09:10:00	42.702	-73.869	
2003-09-02 12:55:00	42.702	-73.859	
2003-09-03 16:40:00	42.701	-73.867	
2003-09-09 20:25:00	42.702	-73.862	
2003-09-11 00:10:00	42.699	-73.862	
2003-09-16 03:55:00	42.701		
2003-09-17 07:40:00	42.702		
2003-09-18 11:25:00	42.701		A
2003-09-29 15:10:00	42.702		
2002-11-27 18:55:00	42.737	-73.775	A
2002-12-13 22:40:00	42.739	-73.776	
2002-12-17 02:25:00	42.736	-73.774	
2002-12-27 06:10:00	42.732	-73.766	
2002-12-27 09:55:00	42.731	-73.767	
2002-12-28 13:40:00	42.735	-73.767	
2003-01-08 17:25:00	42.735	-73.778	
2003-01-22 21:10:00	42.736	-73.776	
2003-01-31 00:55:00	42.734	-73.769	
2003-02-01 04:40:00	42.732	-73.768	
2003-02-07 08:25:00	42.736	-73.775	
2003-02-11 12:10:00	42.731	-73.772	
2003-02-12 15:55:00	42.737	-73.778	

Change from light blue to white shading indicates transition to records for a different animal or tag.
 These blue marks show where the selected records are within the data table. Click on them to jump to the records.
 Selected records on the map. These can be selected from the map (see the Select and Append Select options above) or from the data table.
 Selected records on the data table.

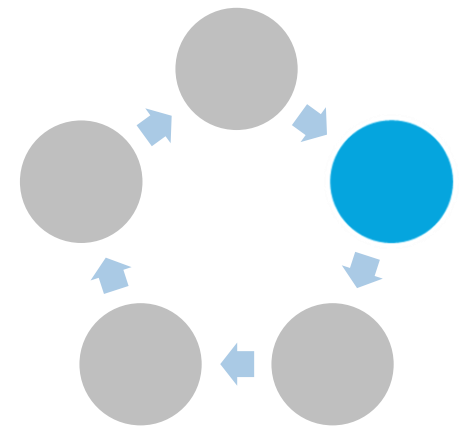
Hold shift or ctrl key to select multiple events.
 Save | Cancel



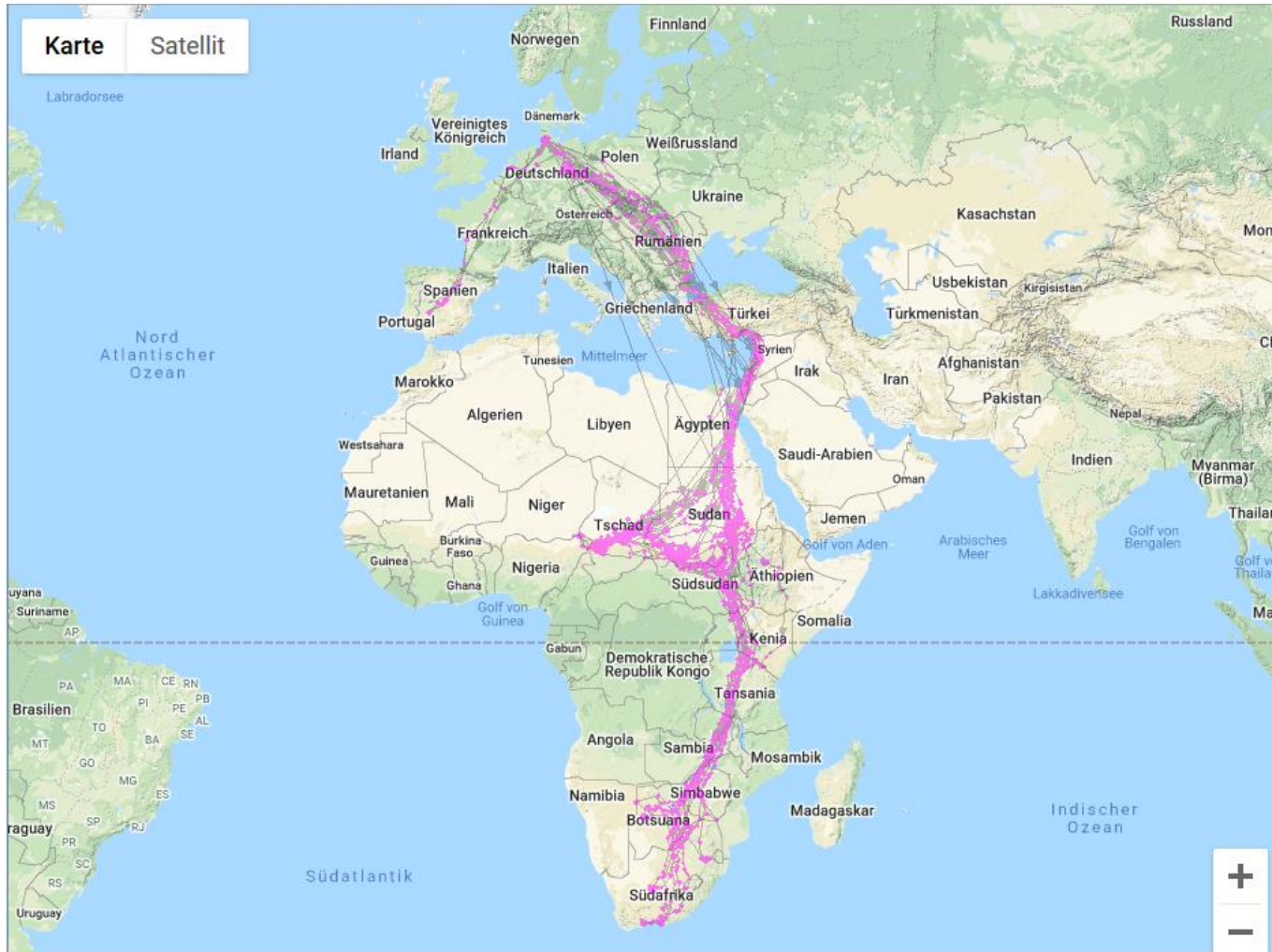
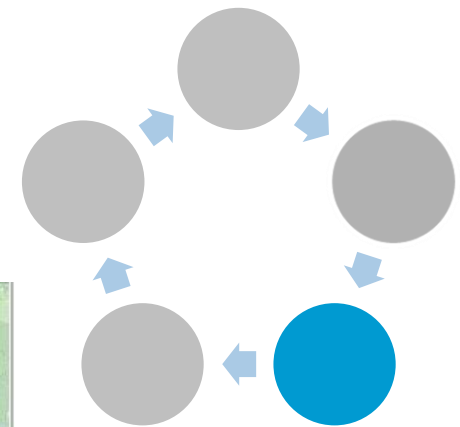
<https://www.movebank.org/cms/movebank-content/event-editor/>
 Abgerufen am 25.03.20

Verarbeitung – Export

- Datenexport in verschiedene Formate
- Zugriff über REST API

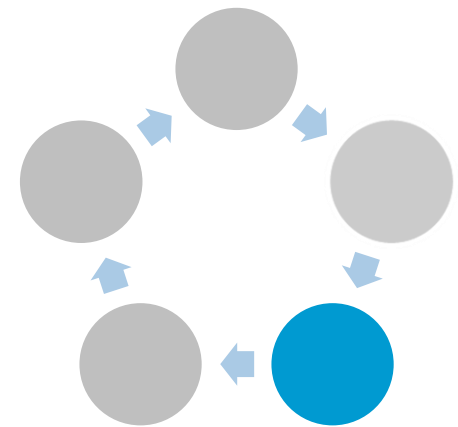


Analyse – Visualisierung Storchenflug



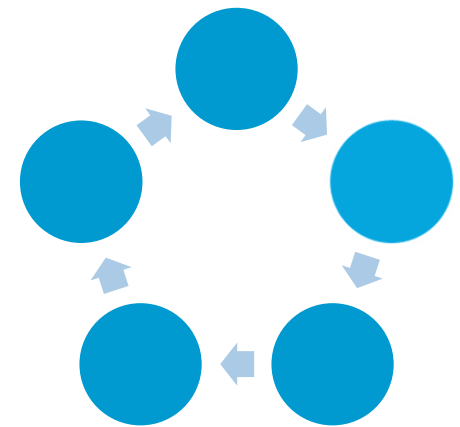
Berthold & Kaatz, 2011.
Movebank ID 446651

Analyse - Software



- **Diverse Software-Pakete zur Analyse von Movebank-Daten**
 - R, Java, Matlab, SciLab, etc.
- **R-Package ‚move‘**
 - Ermöglicht Zugriff auf Movebank-Daten
 - Analysefunktionen
 - Visualisierungsfunktionen
- **ENV-Data**
 - Kombination von Movebank-Daten mit Umweltdaten (Wetter, Topografie, Hydrologie etc.)

Lehre – Open Education



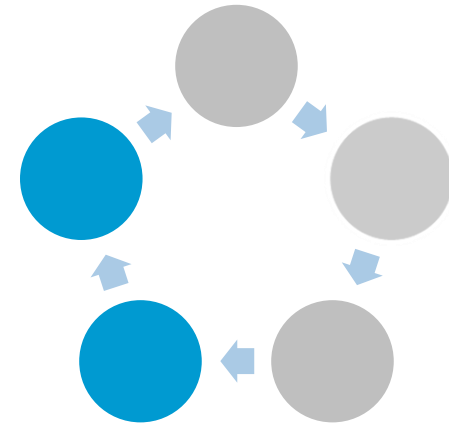
- **Movebank Workshops**
 - 2018 & 2019 am North Carolina Museum of Natural Sciences gehalten
 - Unterstützt durch die US National Science Foundation
 - Inhalte zu Analyse von Tierbewegungsdaten
 - Statistik
 - Visualisierung
 - ENV-Data

- **AniMove Summer School**
 - Zweiwöchige Veranstaltung
 - Zielgruppe: Nachwuchswissenschaftler*innen
 - Findet seit 2013 an verschiedenen Orten statt

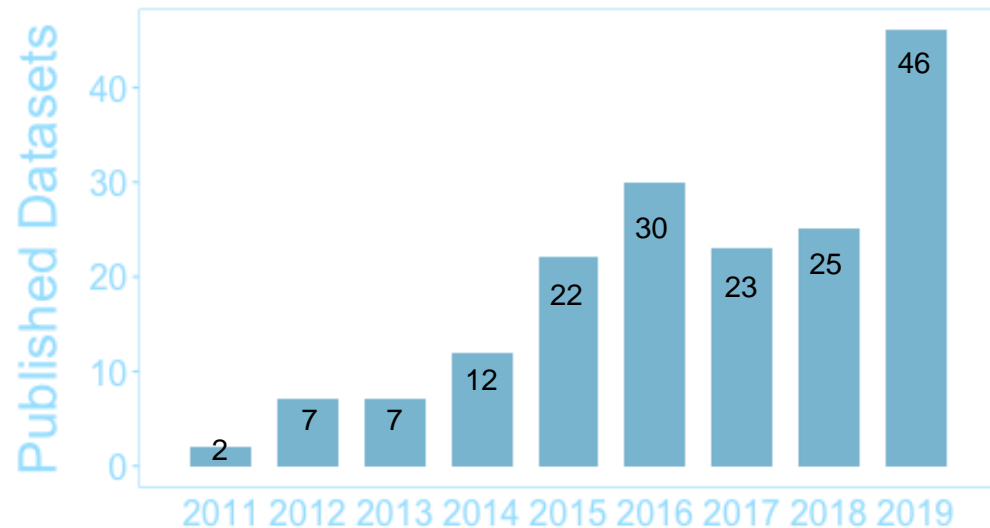


Movebank Data **Repository**

Zahlen & Fakten

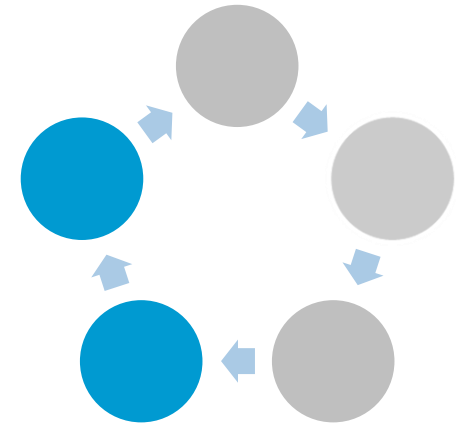


- **Im Zuge des DFG-geförderten Projekts „MoveVRE“ (2010 -2012) entstanden**
 - Betrieb seit Frühjahr 2012
- **166 kuratierte, öffentlich archivierte Datensätze enthalten:**
 - 83 Millionen Bewegungspunkte
 - von 7971 einzelnen Tieren
 - aus 141 verschiedenen Taxa
- **Diese Datensätze sind Grundlage für:**
 - 229 Publikationen
 - in 82 Journals
 - von 528 Datenautor*innen



Stand Dezember 2019

Allgemeines

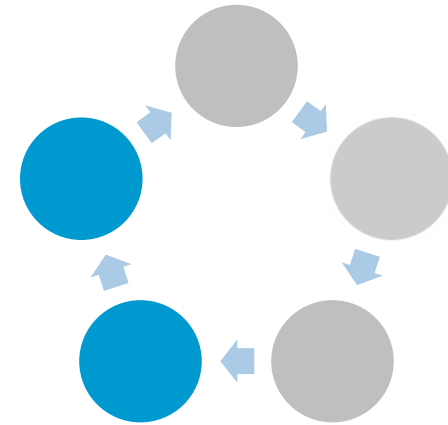


- Erreichbar unter datarepository.movebank.org
- In re3data.org nachgewiesen
- Auf der Liste der Nature „Recommended Data Repositories“
- DOI-Vergabe zur persistenten Referenzierung
- Alle Datensätze sind unter CC0-Lizenz veröffentlicht
- Formale & inhaltliche Kuratierung
- Aktuell Vorbereitung auf CoreTrustSeal-Zertifizierung



<https://www.movebank.org/cms/movebank-content/data-repository> Abgerufen am 25.03.2020

Beispiel Datensatz - Palmenflughunde



Data from: Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed

When using this dataset, please cite the original article.

O'Mara MT, Scharf AK, Fahr J, Abedi-Lartey M, Wikelski M, Dechmann DKN, Safi K (2019) Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed. *Frontiers in Ecology and Evolution*. doi:10.3389/fevo.2019.00200

Additionally, please cite the Movebank data package:

Scharf AK, Fahr J, Abedi-Lartey M, Safi K, Dechmann DKN, Wikelski M, O'Mara MT (2019) Data from: Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed. Movebank Data Repository. doi:10.5441/001/1.k8n02jn8

Cite | Share

Package Identifier

doi:10.5441/001/1.k8n02jn8



Abstract

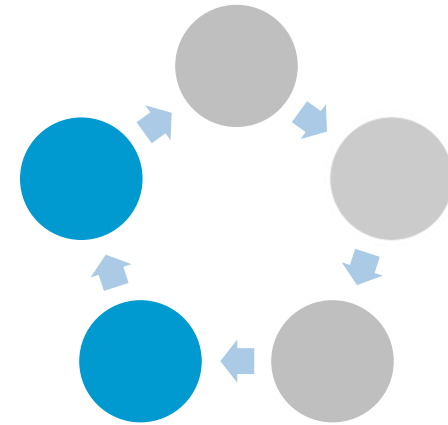
Atmospheric conditions impact how animals use the aerosphere, and birds and bats should modify their flight to minimise energetic expenditure relative to changing wind conditions. To investigate how free-ranging straw-colored fruit bats (*Eidolon helvum*) fly with changing wind support, we use data collected from bats fit with GPS loggers and an integrated triaxial accelerometer and measure flight speeds, wingbeat frequency, and overall dynamic body acceleration (ODBA) as an estimate for energetic expenditure. We predicted that if ODBA reflects energetic expenditure, then we should find a curvilinear relationship between ODBA and airspeed consistent with aerodynamic theory. We expected that bats would lower their airspeed with tailwind support and that ODBA will decrease with increasing tailwinds and increase with wingbeat frequency. We found that wingbeat frequency has the strongest positive relationship with ODBA. There was a small, but negative, relationship between airspeed and ODBA, and bats decreased ODBA with increasing tailwind. Bats flew at ground speeds of 9.6 ± 2.4 ms⁻¹ (mean \pm sd, range: 4.3 to 23.9 ms⁻¹) and airspeeds of 10.2 ± 2.5 ms⁻¹, and did not modify their wingbeat frequency with speed. Free-ranging straw-colored fruit bats therefore exerted more total ODBA in headwinds but not when they changed their airspeed. It is possible that the flexibility in wingbeat kinematics may make flight of free-ranging bats less costly than currently predicted or alternatively that the combination of ODBA and airspeed at our scales of measurement does not reflect this relationship in straw-colored fruit bats. Further work is needed to understand the full potential of free-ranging bat flight and how well bio-logging techniques reflect the costs of bat flight.

Keywords

animal movement, animal tracking, avian migration, biotelemetry, body acceleration, Burkina Faso, *Eidolon helvum*, flight behavior, Ghana, GPS logger, straw-colored fruit bat, Zambia,

dx.doi.org/10.5441/001/1.k8n02jn8

Beispiel Datensatz - Palmenflughunde



Data from: Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed

When using this dataset, please cite the original article

O'Mara MT, Scharf AK, Fahr J, Abedi-Lartey M, Wikelski M, Dechmann DKN, Safi K (2019) Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed. *Frontiers in Ecology and Evolution*. doi:10.3389/fevo.2019.00200

Additionally, please cite the Movebank data package:

Scharf AK, Fahr J, Abedi-Lartey M, Safi K, Dechmann DKN, Wikelski M, O'Mara MT (2019) Data from: Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed. Movebank Data Repository. doi:10.5441/001/1.k8n02jn8

Cite | Share

Package Identifier

doi:10.5441/001/1.k8n02jn8



Abstract

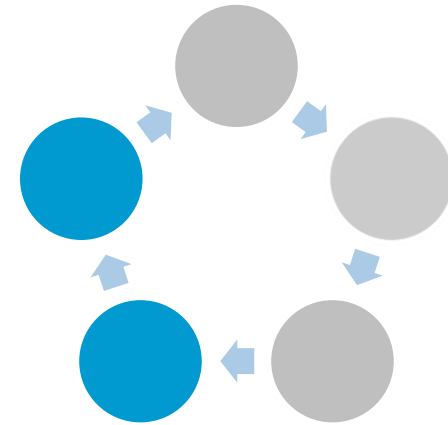
Atmospheric conditions impact how animals use the aerosphere, and birds and bats should modify their flight to minimise energetic expenditure relative to changing wind conditions. To investigate how free-ranging straw-colored fruit bats (*Eidolon helvum*) fly with changing wind support, we use data collected from bats fit with GPS loggers and an integrated triaxial accelerometer and measure flight speeds, wingbeat frequency, and overall dynamic body acceleration (ODBA) as an estimate for energetic expenditure. We predicted that if ODBA reflects energetic expenditure, then we should find a curvilinear relationship between ODBA and airspeed consistent with aerodynamic theory. We expected that bats would lower their airspeed with tailwind support and that ODBA will decrease with increasing tailwinds and increase with wingbeat frequency. We found that wingbeat frequency has the strongest positive relationship with ODBA. There was a small, but negative, relationship between airspeed and ODBA, and bats decreased ODBA with increasing tailwind. Bats flew at ground speeds of 9.6 ± 2.4 ms⁻¹ (mean \pm sd, range: 4.3 to 23.9 ms⁻¹) and airspeeds of 10.2 ± 2.5 ms⁻¹, and did not modify their wingbeat frequency with speed. Free-ranging straw-colored fruit bats therefore exerted more total ODBA in headwinds but not when they changed their airspeed. It is possible that the flexibility in wingbeat kinematics may make flight of free-ranging bats less costly than currently predicted or alternatively that the combination of ODBA and airspeed at our scales of measurement does not reflect this relationship in straw-colored fruit bats. Further work is needed to understand the full potential of free-ranging bat flight and how well bio-logging techniques reflect the costs of bat flight.

Keywords

animal movement, animal tracking, avian migration, biotelemetry, body acceleration, Burkina Faso, *Eidolon helvum*, flight behavior, Ghana, GPS logger, straw-colored fruit bat, Zambia,

dx.doi.org/10.5441/001/1.k8n02jn8

Beispiel Datensatz - Palmenflughunde



Straw-colored fruit bats (*Eidolon helvum*) in Africa 2009-2014-gps [View File Details](#)

Download: [README.txt](#) (18.56Kb)

Download: [Straw-colored fruit bats \(*Eidolon helvum*\) in Africa 2009-2014-gps.csv](#) (4.497Mb)

To the extent possible under law, the authors have waived all copyright and related or neighboring rights to this data.



Straw-colored fruit bats (*Eidolon helvum*) in Africa 2009-2014-acc [View File Details](#)

Download: [README.txt](#) (18.56Kb)

Download: [Straw-colored fruit bats \(*Eidolon helvum*\) in Africa 2009-2014-acc.csv](#) (1.250Gb)

To the extent possible under law, the authors have waived all copyright and related or neighboring rights to this data.



Straw-colored fruit bats (*Eidolon helvum*) in Africa 2009-2014-reference-data [View File Details](#)

Download: [README.txt](#) (18.56Kb)

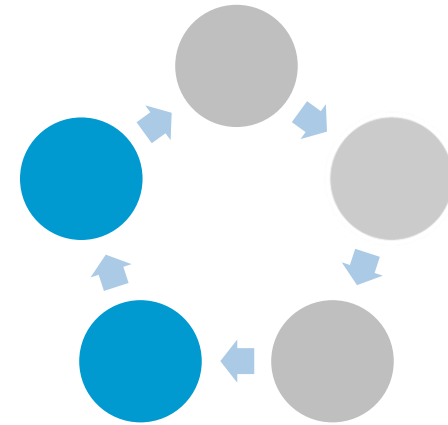
Download: [Straw-colored fruit bats \(*Eidolon helvum*\) in Africa 2009-2014-reference-data.csv](#) (23.28Kb)

To the extent possible under law, the authors have waived all copyright and related or neighboring rights to this data.



dx.doi.org/10.5441/001/1.k8n02jn8

Struktur Datensätze

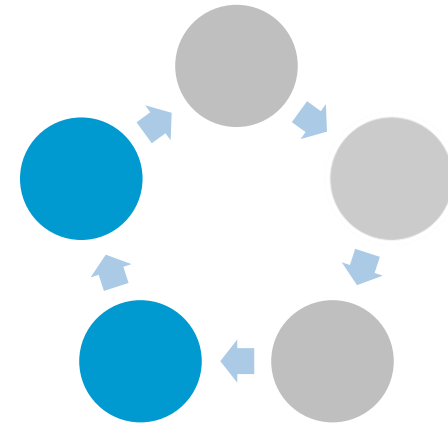


Bewegungsdaten

Referenzdaten

Readme

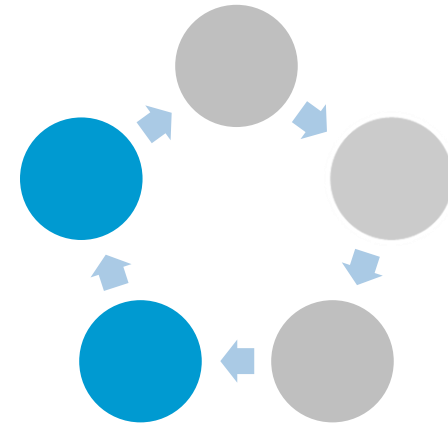
Beispiel Bewegungsdaten - Palmenflughunde



1	event-id	visible	timestamp	location-long	location-lat	eobs:battery-voltage	tag-local-identifier
2	4867397312	true	10.08.2013 18:58:31	-1,4972975	12,3828987	4208	1617
3	4867397313	true	10.08.2013 19:00:09	-1,4970394	12,38287	4204	1617
4	4867397314	true	10.08.2013 19:30:14	-1,4975039	12,3830343	4208	1617
5	4867397315	true	10.08.2013 20:00:54	-1,4977117	12,3833251	4204	1617
6	4867397316	true	10.08.2013 20:19:06			4204	1617
7	4867397317	true	10.08.2013 20:30:43	-1,4985502	12,3831154	4199	1617
8	4867397318	true	10.08.2013 21:00:28	-1,4990864	12,3831537	4194	1617
9	4867397319	true	10.08.2013 21:18:09	-1,4987144	12,3830616	4189	1617
10	4867397320	true	10.08.2013 21:20:11	-1,4984254	12,3835163	4189	1617
11	4867397321	true	10.08.2013 21:22:51	-1,4985618	12,3835698	4184	1617
12	4867397322	true	10.08.2013 21:27:40	-1,5016195	12,3741868	4189	1617
13	4867397323	true	10.08.2013 21:30:11	-1,5018975	12,3680004	4184	1617
14	4867397324	true	10.08.2013 21:33:09	-1,5025731	12,3674001	4179	1617

dx.doi.org/10.5441/001/1.k8n02jn8

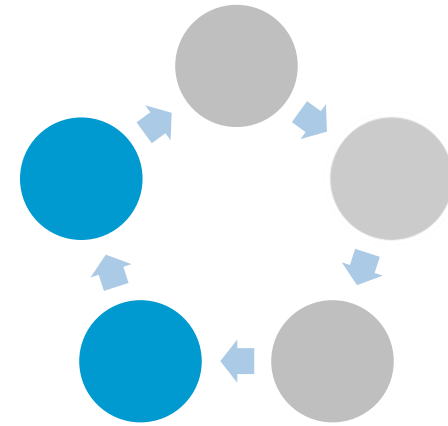
Beispiel Bewegungsdaten - Palmenflughunde



1	event-id	visible	timestamp	location-long	location-lat	eobs:battery-voltage	tag-local-identifier
2	4867397312	true	10.08.2013 18:58:31	-1,4972975	12,3828987	4208	1617
3	4867397313	true	10.08.2013 19:00:09	-1,4970394	12,38287	4204	1617
4	4867397314	true	10.08.2013 19:30:14	-1,4975039	12,3830343	4208	1617
5	4867397315	true	10.08.2013 20:00:54	-1,4977117	12,3833251	4204	1617
6	4867397316	true	10.08.2013 20:19:06			4204	1617
7	4867397317	true	10.08.2013 20:30:43	-1,4985502	12,3831154	4199	1617
8	4867397318	true	10.08.2013 21:00:28	-1,4990864	12,3831537	4194	1617
9	4867397319	true	10.08.2013 21:18:09	-1,4987144	12,3830616	4189	1617
10	4867397320	true	10.08.2013 21:20:11	-1,4984254	12,3835163	4189	1617
11	4867397321	true	10.08.2013 21:22:51	-1,4985618	12,3835698	4184	1617
12	4867397322	true	10.08.2013 21:27:40	-1,5016195	12,3741868	4189	1617
13	4867397323	true	10.08.2013 21:30:11	-1,5018975	12,3680004	4184	1617
14	4867397324	true	10.08.2013 21:33:09	-1,5025731	12,3674001	4179	1617

dx.doi.org/10.5441/001/1.k8n02jn8

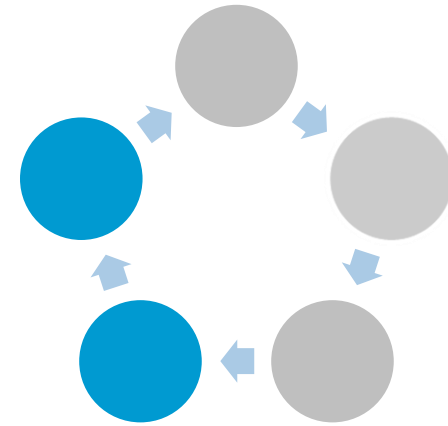
Beispiel Referenzdaten - Palmenflughunde



1	tag-id	animal-id	animal-taxon	deploy-on-date	deploy-off-date	animal-comments	animal-life-s	animal-mass
2	1079	1079	Eidolon helvum	2009-08-26 18:09:01.000	2009-08-29 04:40:37.000	forearm length: 118.1 mm	adult	284.0
3	1080	1080	Eidolon helvum	2009-08-26 18:09:25.000	2009-08-28 05:50:38.000	forearm length: 113.9 mm	adult	244.0
4	1081	1081	Eidolon helvum	2009-08-26 18:29:16.000	2009-08-29 05:50:36.000	forearm length: 123.5 mm	adult	274.0
5	1082	1082	Eidolon helvum	2009-08-27 18:40:56.000	2009-08-28 05:50:17.000	forearm length: 120 mm	adult	246.0
6	1084	1084	Eidolon helvum	2009-08-28 18:13:24.000	2009-08-31 22:45:43.000	forearm length: 115.1 mm	adult	239.0
7	1086	1086	Eidolon helvum	2009-08-28 18:24:49.000	2009-08-30 05:45:42.000	forearm length: 118.2 mm	adult	277.0
8	1088	1088	Eidolon helvum	2009-08-28 18:34:08.000	2009-08-30 05:55:31.000	forearm length: 120 mm	adult	247.0
9	1626	1626	Eidolon helvum	2011-02-02 05:56:00.000	2011-02-04 17:56:00.000	forearm length: 119.1 mm	adult	280.0
10	1607	1607	Eidolon helvum	2011-02-03 06:02:00.000	2011-02-09 11:42:00.000	forearm length: 124.7 mm	adult	321.0
11	1613	1613	Eidolon helvum	2011-02-03 06:26:00.000	2011-02-04 10:41:00.000	forearm length: 123.4 mm	adult	305.0
12	1616	1616	Eidolon helvum	2011-02-05 05:09:00.000	2011-02-07 09:30:00.000	forearm length: 121 mm	adult	292.0

dx.doi.org/10.5441/001/1.k8n02jn8

Dokumentation Datensätze



- **Readme-Datei enthält:**
 - Umfangsbeschreibung des Datensatzes
 - Zitationsangabe für den Datensatz
 - Referenz zu Publikationen, die auf dem Datensatz basieren
 - Lizenzhinweis (CC0)
 - Erläuterung der im Datensatz verwendeten Attribute

Ziel: langfristige **Nachnutzbarkeit**
der Daten

Movebank 2.0

Movebank 2.0



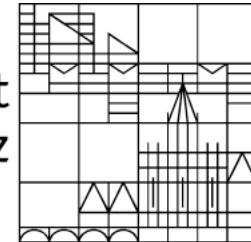
Baden-Württemberg

MINISTERIUM FÜR WISSENSCHAFT, FORSCHUNG UND KUNST



MAX-PLANCK-GESELLSCHAFT

Universität
Konstanz



- Laufzeit: 01.06.2019 – 31.05.2023

Ziele des Projekts

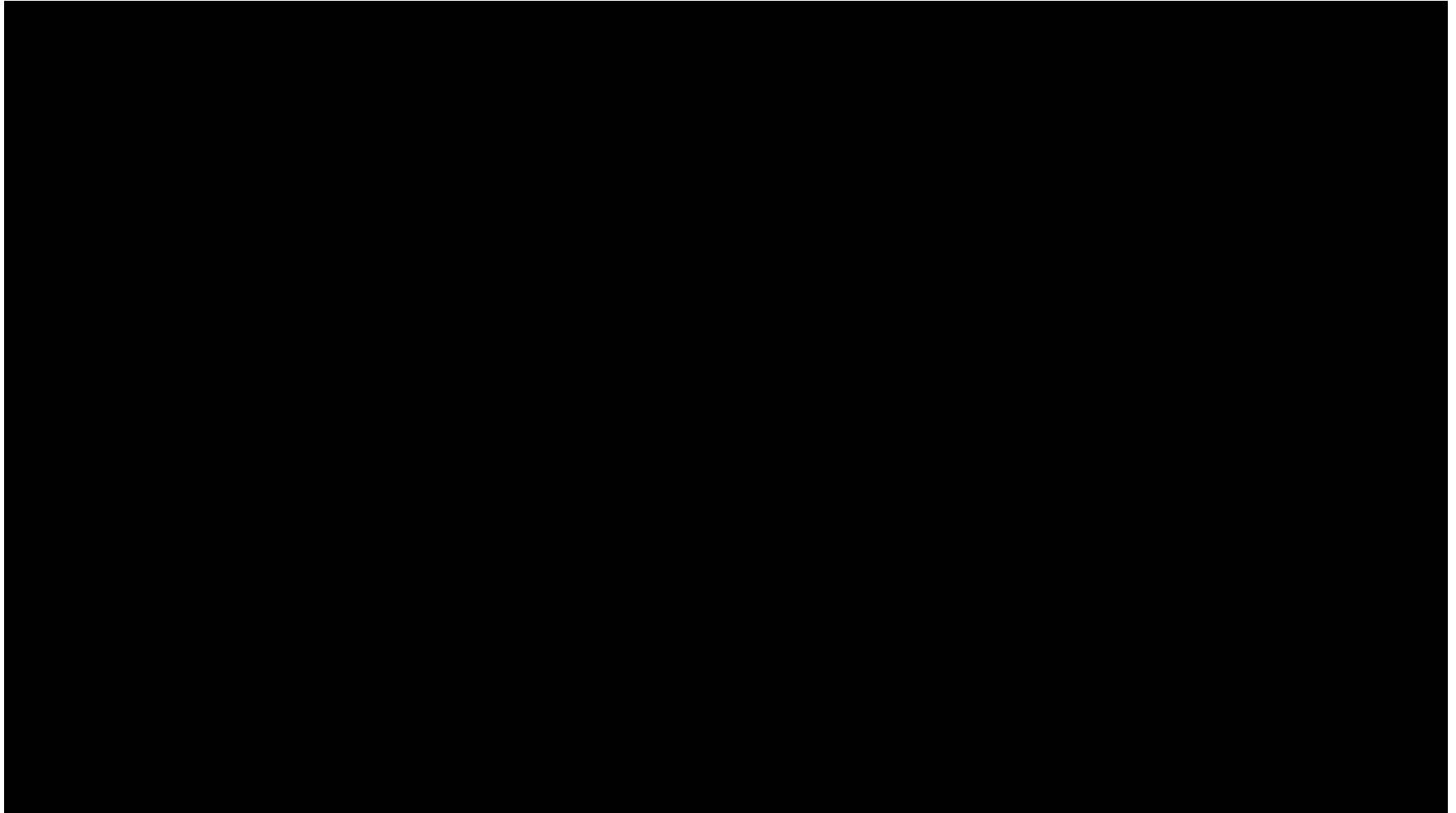


- Erweiterung von Movebank für neue Sensortechnologien
- Entwicklung von Analysesoftware zur Visualisierung & Exploration der Daten
- Einbeziehung von Bürgerwissenschaftler*innen
- Unterstützung der Open-Source-Community bei der Entwicklung von Analysewerkzeugen
- Ausbau der AniMove Summer School & Bereitstellung von E-Learning-Angeboten

Erweiterung der Metadaten

- **Neue Sensoren erheben neue Arten von Daten**
 - z.B. Beschleunigung, Gravitation, Lichtintensität etc.
- **Anreicherung der Daten mit Citizen Science-Inhalten**
 - Drohnenaufnahmen, Videos, Audio, etc.
- **Movebank Attribute Dictionary muss erweitert werden**

ICARUS



MaxPlanckSociety, 2019

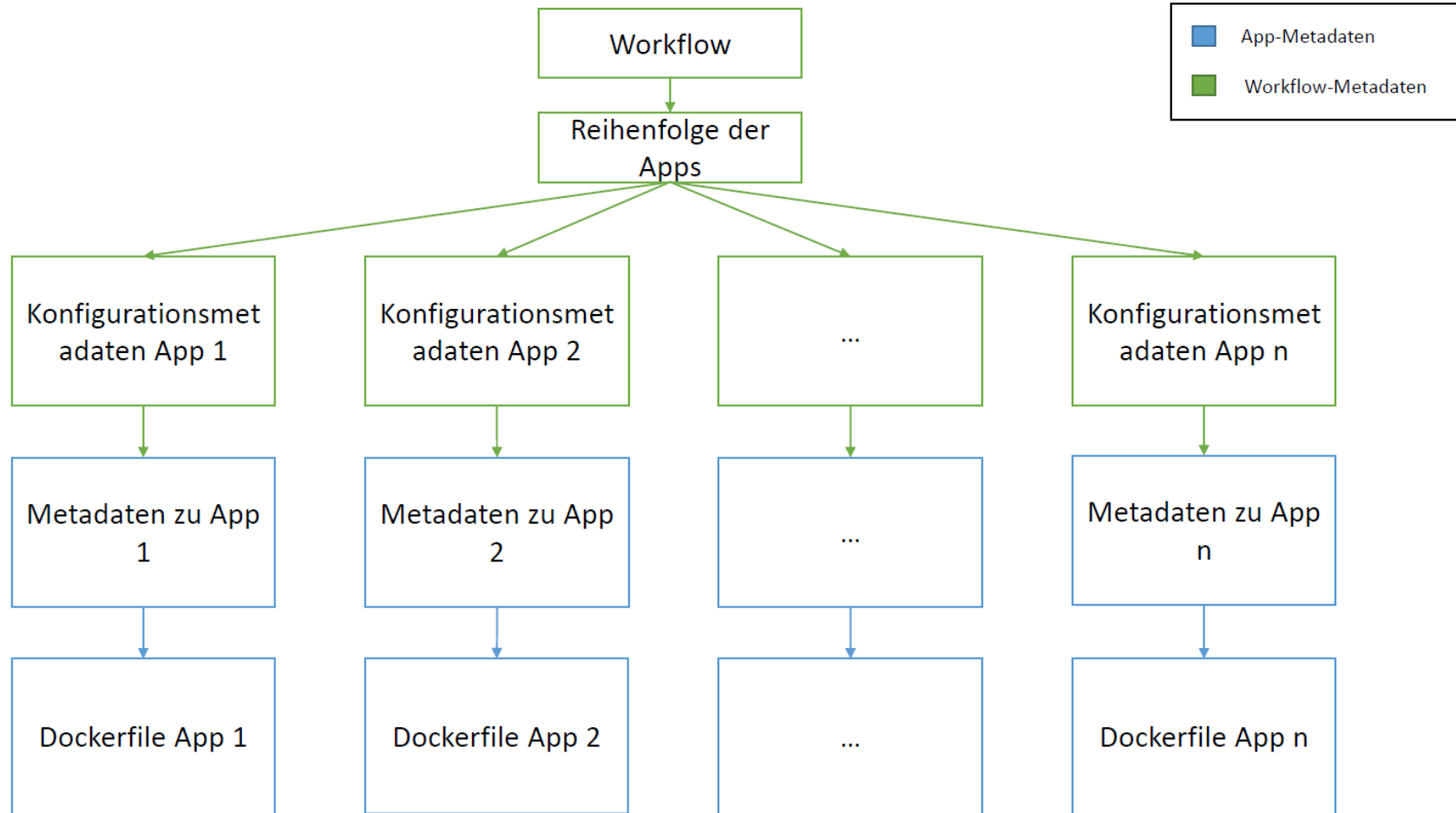
https://www.youtube.com/watch?v=e_KNyhQMjOY; Abgerufen am 25.03.2020

MoveStore Metadatenchema

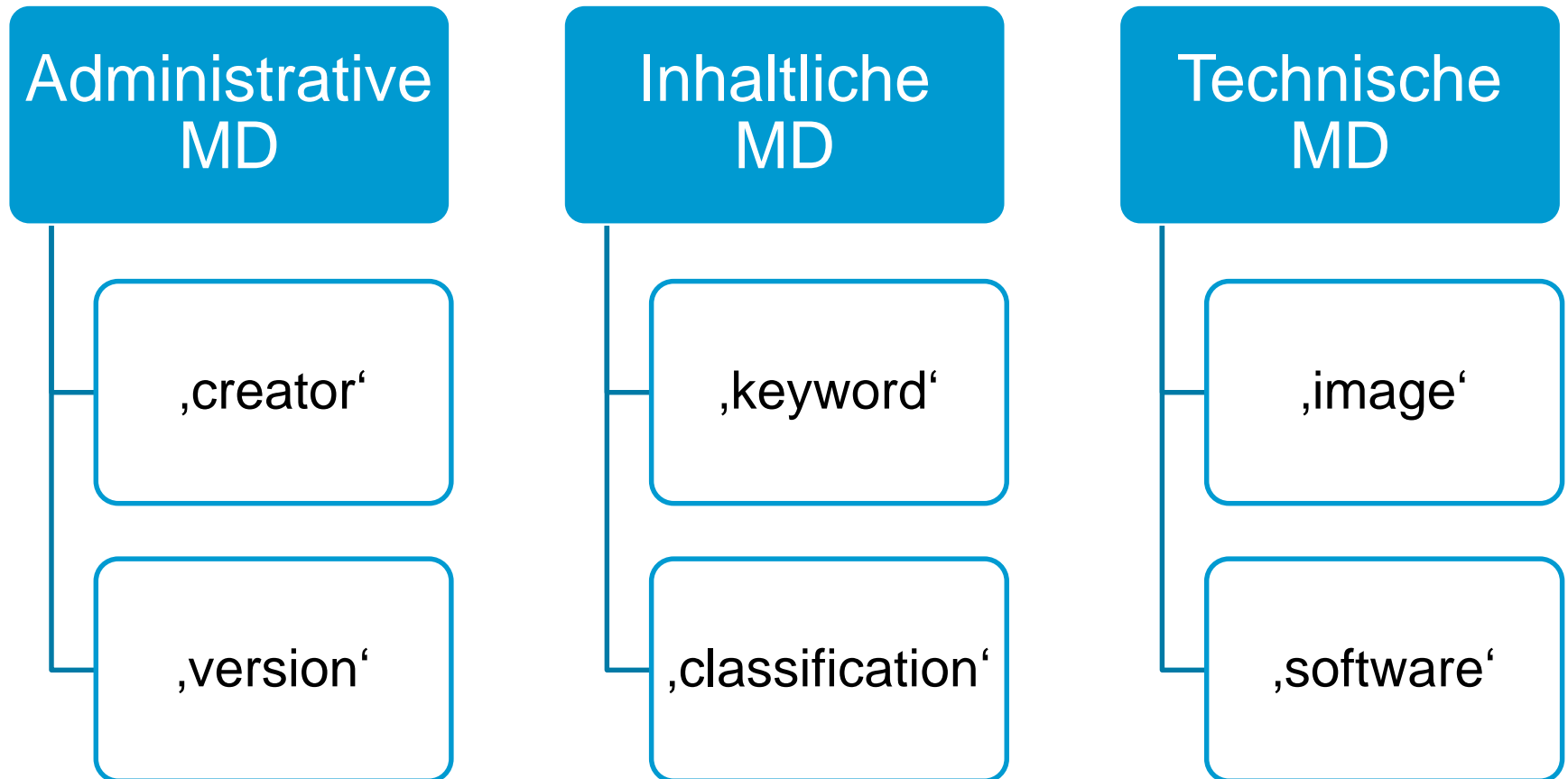
- **MoveStore**
 - Plattform zur Entwicklung- & Veröffentlichung von Analysewerkzeugen für Movebank-Daten
 - Unterstützung der Open-Source-Community
 - Einzelne Software-Anwendungen sollen als Apps bereitgestellt werden
 - Möglichkeit der modularen Kombination von Apps zu Workflows
- **Apps & Workflows sollen persistent gespeichert & referenziert werden können**
- **Entwurf eines Metadatenchemas zur persistenten Speicherung der Apps und Workflows**

MoveStore Metadatenchema

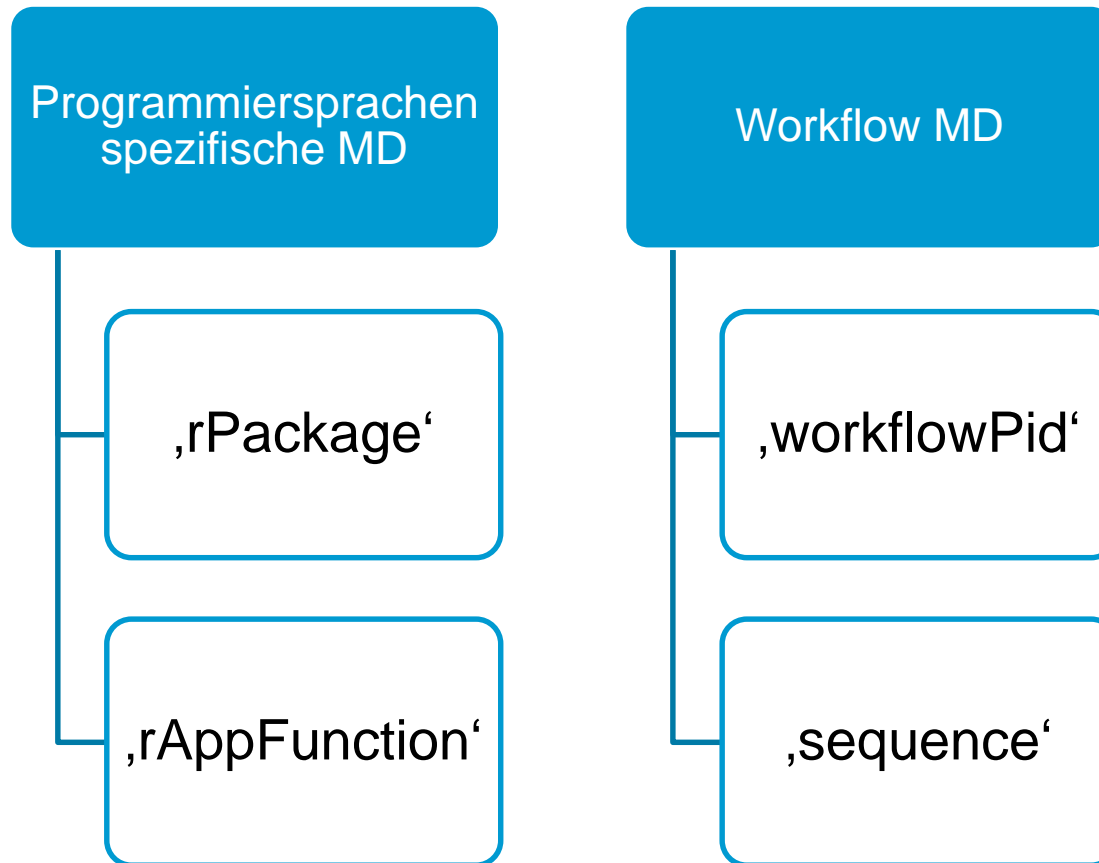
- Konzept



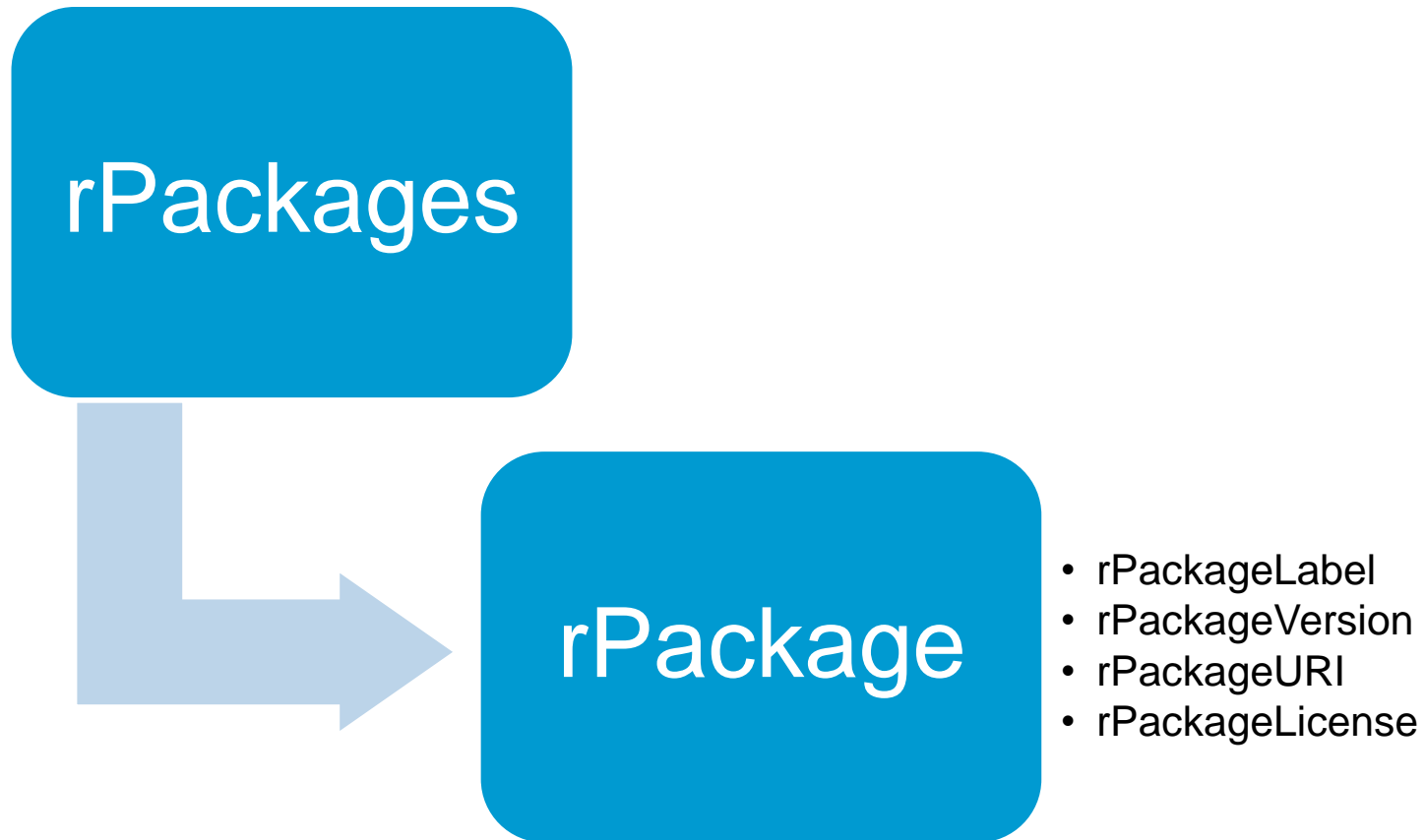
MoveStore Metadatenschema



MoveStore Metadatenchema



MoveStore Metadatenschema



Aufzeichnung AniMove & e-Learning



- **Aufzeichnung der AniMove Summer School**
 - 07.09. – 18.09. am MPI für Verhaltensbiologie in Radolfzell
 - Begrenzte Teilnehmer*innen-Kapazität
 - Großes Interesse → Aufnahme der Veranstaltung durch das KIM Lecture Recording-Team
- **Beitrag zum Thema Forschungsdatenmanagement zur Summer School**
- **Entwurf & Bereitstellung von E-Learning im Bereich Forschungsdatenmanagement**

Kooperationsmöglichkeiten für Infrastruktureinrichtungen

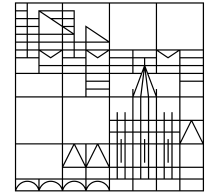
Kooperationsmöglichkeiten für Infrastruktureinrichtungen

- **Bibliotheken als Spezialisten für die Klassifizierung digitaler Objekte**
 - Unterstützung beim Entwurf von Datenstrukturen und Metadatenschemata
- **Kompetenz im Forschungsdatenmanagement**
 - Beratung und Dienstleistungen für die Planung, Durchführung und Sicherung von Forschungsvorhaben
- **Erfahrung in Softwareentwicklung & Anforderungsmanagement**
 - Unterstützung von Projektpartnern mit externen Dienstleistern
- **Partner mit Einbindung in langfristig bestehende Institutionen**
 - Möglichkeit des Aufbaus von langfristig betreibbaren Infrastrukturen
- **Erfahrung im Bereich Informationsvermittlung**
 - Konzeption & Durchführung von spezifisch zugeschnittenen Schulungen



MAX-PLANCK-GESELLSCHAFT

Universität
Konstanz



**Herzlichen
Dank!**

Gabriel Schneider & Dr. Elisabeth Böker
Team Open Science · KIM Universität
Konstanz

kim.uni-konstanz.de

gabriel.schneider@uni-konstanz.de

elisabeth.boeker@uni-konstanz.de

Quellen

- AniMove. <http://animove.org/>
- Berthold P & Kaatz M (2011) MPIO White Stork Argos. Verfügbar in Movebank unter der Movebank ID: 446651.
- Fieberg J, Bohrer G, Davidson SC, Kays R (2018) Short course on analyzing animal tracking data. Presented at the North Carolina Museum of Natural Sciences, Raleigh, NC, USA. May 21–23, 2018. <https://movebankworkshopraleighnc.netlify.com/index.html>. Abgerufen am 25.03.2020.
- Kranstauber B, Smolla M, Scharf A (2019) move: Visualizing and Analyzing Animal Track Data. Version 3.2.2 . Verfügbar unter: <https://CRAN.R-project.org/package=move>. Abgerufen am 25.03.2020.
- Kranstauber B, Cameron A, Weinzerl R, Fountain T, Tilak S, Wikelski M, Kays R (2011) The Movebank data model for animal tracking. <https://doi.org/10.1016/j.envsoft.2010.12.005>.
- MaxPlanckSociety (2018) Flugverhalten von Störchen in der Thermik. <https://www.youtube.com/watch?v=RRq-panAKME>. Abgerufen am 25.03.2020.

Quellen

- **MaxPlanckSociety (2019) Icarus initiative: Wildlife Observation from Space.**
https://www.youtube.com/watch?v=e_KNyhQMjOY. Abgerufen am 25.03.2020.
- **Movebank.** <https://www.movebank.org/>. Abgerufen am 25.03.2020.
- **Movebank (2017) Global animal movements based on Movebank data (map).**
<https://youtu.be/nUKh0fr1Od8> Abgerufen am 25.03.2020.
- **Movebank Data Repository.** <https://www.datarepository.movebank.org/> Abgerufen am 25.03.2020.
- **O'Mara MT, Scharf AK, Fahr J, Abedi-Lartey M, Wikelski M, Dechmann DKN, Safi K (2019) Overall dynamic body acceleration in straw-colored fruit bats increases in headwinds but not with airspeed. Frontiers in Ecology and Evolution. doi:10.3389/fevo.2019.00200.**
- **Patterson, B (2007) Tsavo Lion Study. Verfügbar in Movebank unter der Movebank ID: 220229.**