



# Introduction to MySQL

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SDSU Field Station Programs





# What is MySQL?

- A database software
- Understands SQL, mostly
  - Define structure
  - Store data
  - Manipulate data
  - View data
- Free, runs on Unix, Linux and Windows
- Tools to make it easier to work with





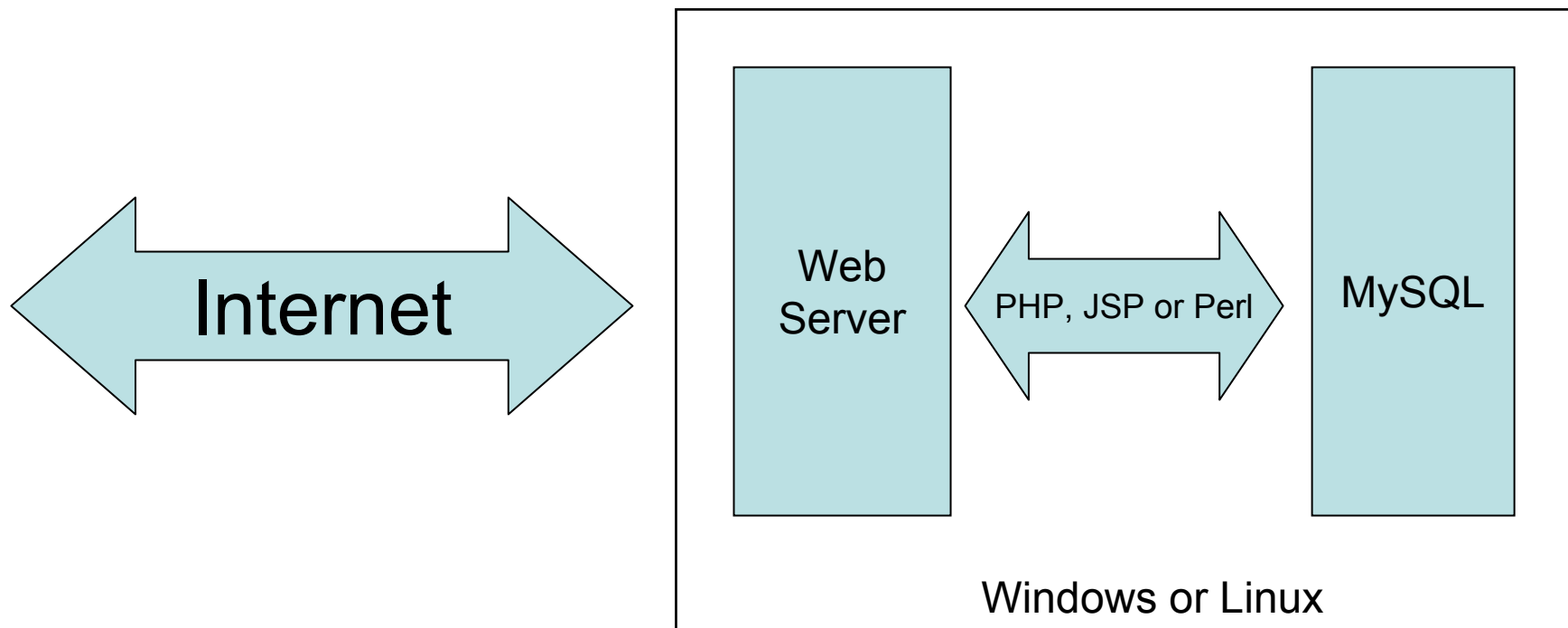
# Good, fast, cheap: pick 2

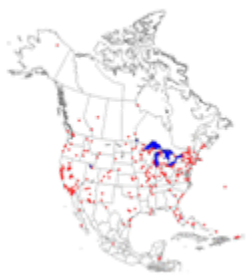
	good	cheap	fast
Microsoft Access	X	X	
Microsoft SQL Server	X		X
Oracle	X		X
PostgreSQL * No Windows Version	X*	X	X
MySQL 4	GOOD ENOUGH	X	X
MySQL 5	X	X	X





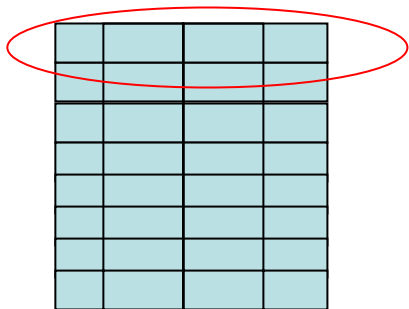
# Typical Configuration



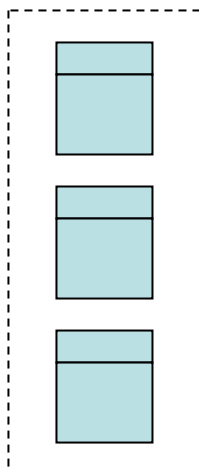


# MySQL Concepts & Terminology: Tables & Databases

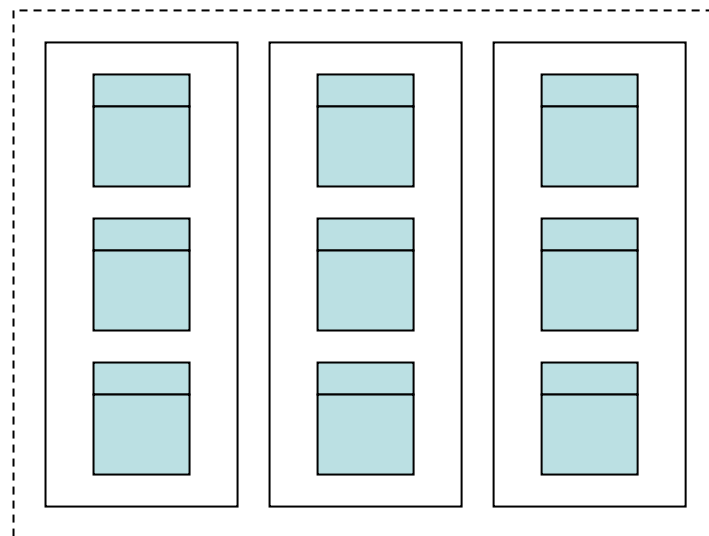
column names = “field”



table



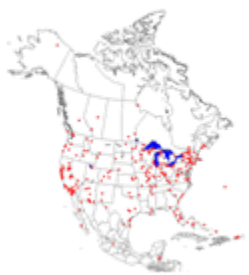
database



MySQL Server

“schema” - the structure of a database & its tables





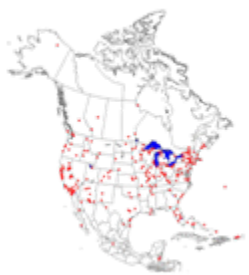
# Field Designations




**Field Name**  
**Field Type**  
**Primary Key**  
**Null or Not Null**  
**Default Value**  
**Auto increment**  
**Index**

Typical settings:  
required  
required  
only for primary key  
depends  
depends  
for arbitrary primary key  
if important for searching





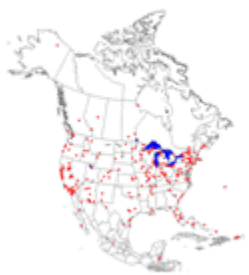
# Table Structure vs. Content



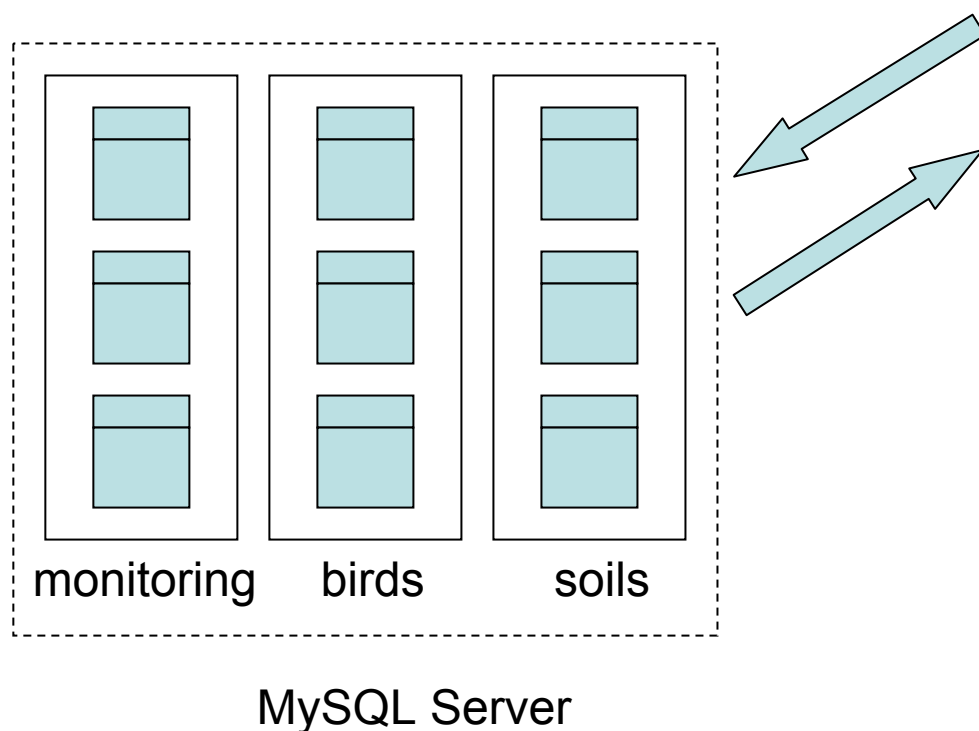
Structure: what columns does it have?  
what type are the columns?

Content: the rows of data stored





# MySQL Concepts & Terminology: Queries & Results



“Queries”: commands issued to server

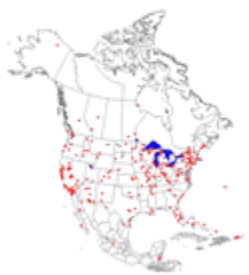
“Results”: response by server  
aka “Result set”  
aka “Returned rows”

Queries can be any type of command:

- Create/modify/delete db's & tables
- Insert/delete/modify rows of data
- Gather information
- Analyze/compute information







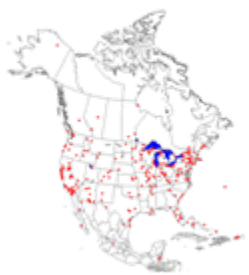
# Steps for Creating a Database

1. Create a database

2. Create a table / design columns:

- Name of column
- Type of column
- Auto-increment? Null? Default value? Primary Key?





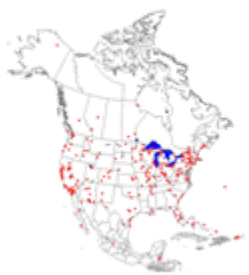
# Command Line Interface

```
mysql> use MonitoringProject;  
Database changed
```

```
mysql> show tables;
```

```
+-----+  
| Tables_in_MonitoringProject |  
+-----+  
| Plots                        |  
| Species                     |  
| Transects                   |  
+-----+
```





# MySQL Commands for Database

## 1. Create a database

**show databases;**

(lists db's)

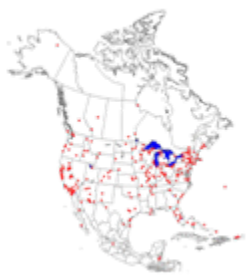
**use turtles;**

(subsequent queries are directed at this db)

**create database birds;**

(creates a new db called "birds")





# MySQL Commands for Tables

## 2. Create a table / design columns:

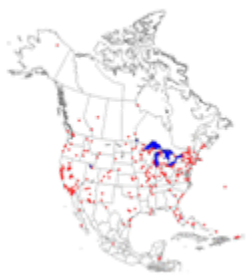
**Show tables;**

(lists all tables in current db)

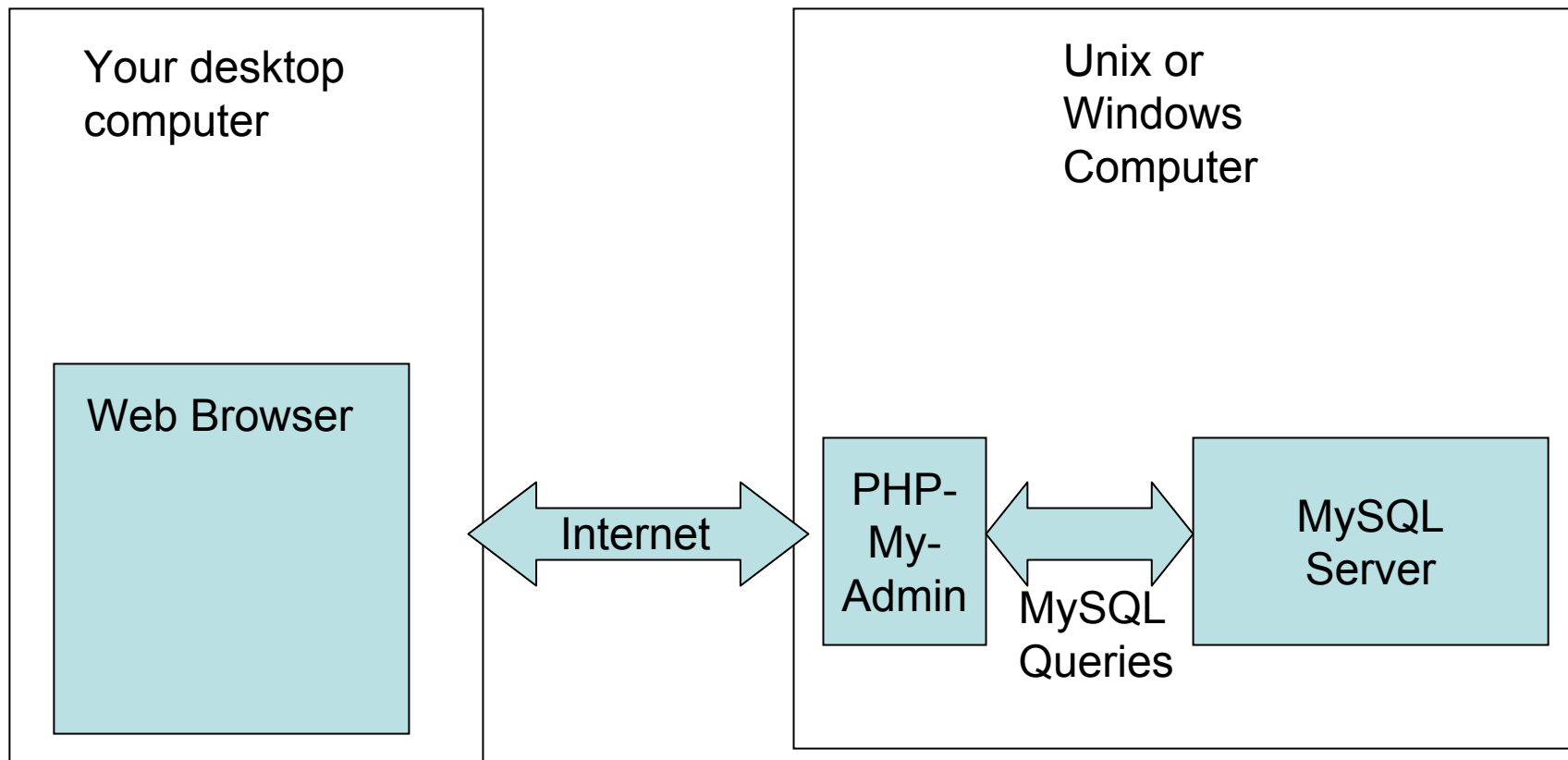
```
CREATE TABLE `tree` (  
  `tree_id` INT NOT NULL AUTO_INCREMENT,  
  `common_name` VARCHAR( 255 ) NOT NULL ,  
  `scientific_name` VARCHAR( 255 ) NOT NULL ,  
  PRIMARY KEY ( `tree_id` )  
);
```

(Creates a table while specifying column names and types, and which is the primary key.)





# Introduction to PHPMyAdmin





phpMyAdmin 2.6.1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Reload Print Mail News RSS Feeds Links

Address <https://www.lternet.edu/mysql/> Go

Google Search 18 blocked Check

# phpMyAdmin

## Welcome to phpMyAdmin 2.6.1

Language:

### Login

(Cookies must be enabled past this point.)

Server:

Username:

Password:



**phpMyAdmin**

Database: rcn\_admin (2)

rcn\_admin

- mytbl
- test\_db

Server: [marsh-ltinternet.edu](http://marsh-ltinternet.edu) Database: rcn\_admin Table: mytbl

Structure Browse SQL Search Insert Export Operations Empty Drop

InnoDB free: 10240 kB

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	sdf	int(10)		UNSIGNED	No		auto_increment	

Check All / Uncheck All With selected:

Print view Relation view Propose table structure?

Add  field(s) ☒ At End of Table ☐ At Beginning of Table ☐ After

Indexes: ?

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	2		sdf

Create an index on  columns

Space usage:

Type	Usage
Data	16,384 Bytes
Index	0 Bytes
Total	16,384 Bytes

Row Statistic:

Statements	Value
Format	fixed
Collation	latin1_swedish_ci
Next Autoindex	6
Creation	Oct 31, 2005 at 02:29 PM

Run SQL query/queries on database rcn\_admin?

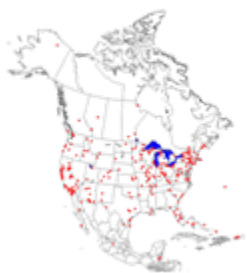
Fields:

SELECT \* FROM 'mytbl' WHERE 1

sdf

<<

☒ Show this query here again



phpMyAdmin













Database: rcn\_admin (2)

rcn\_admin

- mytbl
- test\_db

Server: marsh.lternet.edu Database: rcn\_admin

Structure SQL Export Search

Table	Action	Records
mytbl	     	
test_db	     	
2 table(s) Sum		

Check All / Uncheck All With select

Print view Data Dictionary

Create new table on database rcn\_admin:

Name:

Fields:  Go

Server: marsh.lternet.edu Database: rcn\_admin Table: trees




Field	Type?	Length/Values*	Collation	Attributes	Null	Default**	Extra			
tree_id	INT				not null		auto_increment	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
scientific_name	VARCHAR	255			not null			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
common_name	VARCHAR	255			null			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table comments:

Table type:

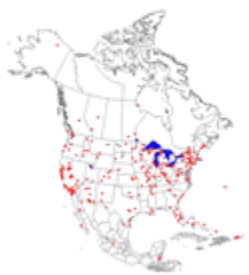
Default

Collation:

Add 1 field(s) Go

Save





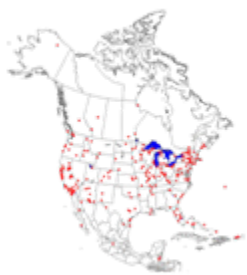
# Try it yourself in PHPMyAdmin

1. Create a database called zialab1  
(already done)
2. Create a location table

Location_id	Int	Not null	Auto_increment	Primary_key
Site	Varchar	Not null		
Web	Small int	Not null		
Plot	Enum('N','S','E','W')	Not null		
quad	Small int	Not null		

3. Repeat with observation, visits, species





# Getting Data Into MySQL

- Data entry from scratch
  - Use mysql INSERT command
  - Use data entry interface of MySQL tools
    - PhpMyAdmin
    - DBDesigner
    - MySQL Query Browser
- Importing from Excel or text

Tools for MySQL [Next...]

