

National Park Service  
U.S. Department of the Interior  
Natural Sounds & Night Skies Division



# Natural Sounds Program Technical Assistance Request Guidance

*Summer 2015*

# Natural Sounds & Night Skies Division

- WASO level division, located in Fort Collins, CO
- Regional representatives in AKR, PWR, SER
- Part of Natural Resource Stewardship and Science (NRSS) Directorate
- 3 program areas
  - Science/Engineering
  - Policy, Planning, and Compliance
  - Overflights



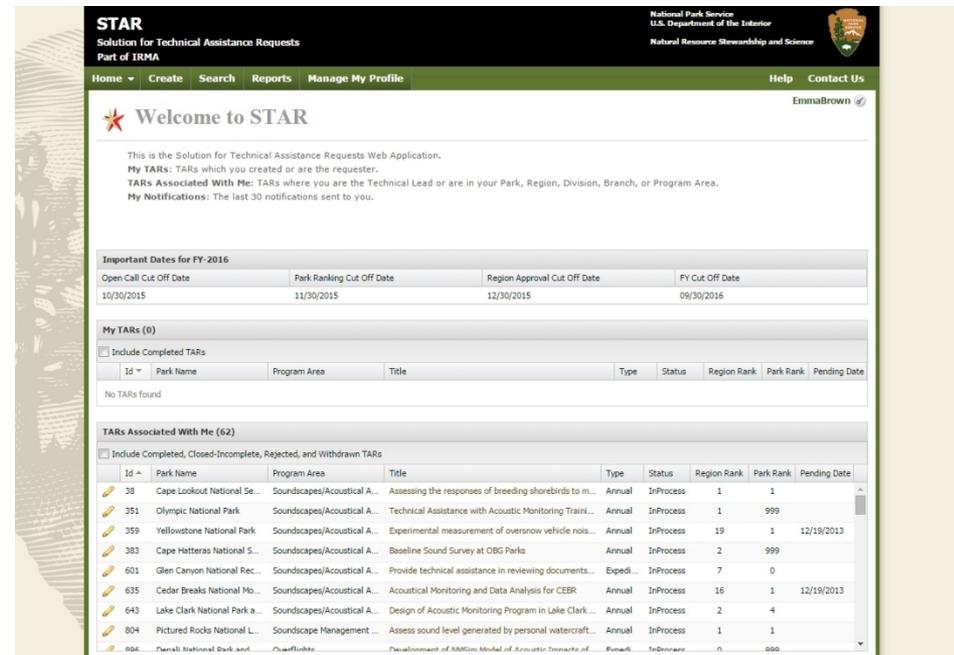
# What we do to assist you!

1. Collect standard acoustic monitoring data
2. Predict acoustic conditions
3. Model impacts of specific sources
4. Assist with planning
5. Conduct wildlife/visitor studies
6. Outreach programs & events



# Create a Technical Assistance Request

- <https://irma.nps.gov/Star/>
- This is how we create work plans, prioritize our time, etc.



**STAR**  
Solution for Technical Assistance Requests  
Part of IRMA

National Park Service  
U.S. Department of the Interior  
Natural Resource Stewardship and Science

Home Create Search Reports Manage My Profile Help Contact Us

Welcome to STAR

This is the Solution for Technical Assistance Requests Web Application.  
My TARs: TARs which you created or are the requester.  
TARs Associated With Me: TARs where you are the Technical Lead or are in your Park, Region, Division, Branch, or Program Area.  
My Notifications: The last 30 notifications sent to you.

Important Dates for FY-2016

Open Call Cut Off Date	Park Ranking Cut Off Date	Region Approval Cut Off Date	FY Cut Off Date
10/30/2015	11/30/2015	12/30/2015	09/30/2016

My TARs (0)

Include Completed TARs

Id	Park Name	Program Area	Title	Type	Status	Region Rank	Park Rank	Pending Date
No TARs found								

TARs Associated With Me (62)

Include Completed, Closed-Incomplete, Rejected, and Withdrawn TARs

Id	Park Name	Program Area	Title	Type	Status	Region Rank	Park Rank	Pending Date
38	Cape Lookout National Se...	Soundscapes/Acoustical A...	Assessing the responses of breeding shorebirds to m...	Annual	InProcess	1	1	
351	Olympic National Park	Soundscapes/Acoustical A...	Technical Assistance with Acoustic Monitoring Traini...	Annual	InProcess	1	999	
359	Yellowstone National Park	Soundscapes/Acoustical A...	Experimental measurement of oversnow vehicle noise...	Annual	InProcess	19	1	12/19/2013
383	Cape Hatteras National S...	Soundscapes/Acoustical A...	Baseline Sound Survey at OBG Parks	Annual	InProcess	2	999	
601	Glen Canyon National Rec...	Soundscapes/Acoustical A...	Provide technical assistance in reviewing documents...	Expedi...	InProcess	7	0	
635	Cedar Breaks National Mo...	Soundscapes/Acoustical A...	Acoustical Monitoring and Data Analysis for CERR	Annual	InProcess	16	1	12/19/2013
643	Lake Clark National Park a...	Soundscapes/Acoustical A...	Design of Acoustic Monitoring Program in Lake Clark...	Annual	InProcess	2	4	
804	Pictured Rocks National L...	Soundscape Management ...	Assess sound level generated by personal watercraft...	Annual	InProcess	1	1	
886	Denali National Park and...	Chaufontaine	Development of NPS/USFWS Model of Acoustic Impacts of...	Research	InProcess	0	886	

# 1. Standard Acoustic Monitoring

## What it can tell you...

- existing acoustic conditions in a park or specific park units
- baseline conditions
- natural ambient for the park
- percent of the time different noise sources (e.g. aircraft, vehicles) are audible

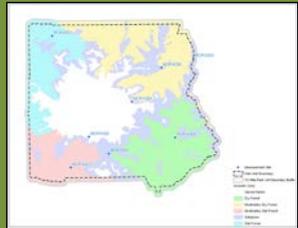
# 1. Standard Acoustic Monitoring

## Estimated timeline

### Logistics

(3-5 days)

- Site selection
- Travel
- Lodging
- Equipment prep
- Shipment
- Permits?



### Data collection

(30 day recording at each site)

- Gear setup (access)
- Outreach at park during monitoring



#### Ways to Enjoy Natural Sound

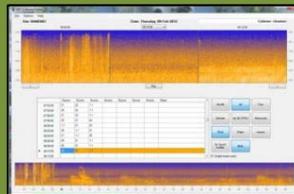
- Close Your Eyes**  
Think: Listen to which sounds you hear. Do you hear more with your eyes closed?
- Count Sounds**  
Put a finger for each sound you hear. Use your left hand for natural sounds and your right hand for human-made sounds.
- Walk and Listen**  
Do you hear your footsteps? Do you hear your clothes rustle? Can you walk without making any sound?
- Appreciate Sounds**  
What is the most beautiful sound you hear? What sound is the best smelling?
- Listen to Landscapes**  
How does the shape of the land affect the way sound travels to you and others in the area of study? Are there any echoes? What is the closest sound you hear?
- Walk in the Wild**  
Walk as though a predator were after you. Walk as though you were a predator!
- Observe an Animal**  
Listen for an animal. What sound does the animal make? Can you make its sound?



### Analysis

(1-2 months)

- CSU listening lab
- Acoustic Monitoring Toolbox



### Products

(1-2 months)

- Snapshot report
- Acoustic Monitoring Report
- Presentation



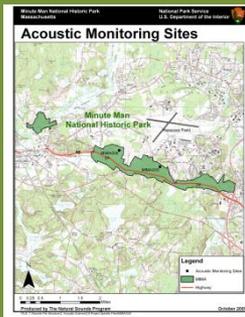
### Use of data for park planning\*

- Air Tour Management Plan
- Soundscape plans
- Wilderness plans
- Resource condition

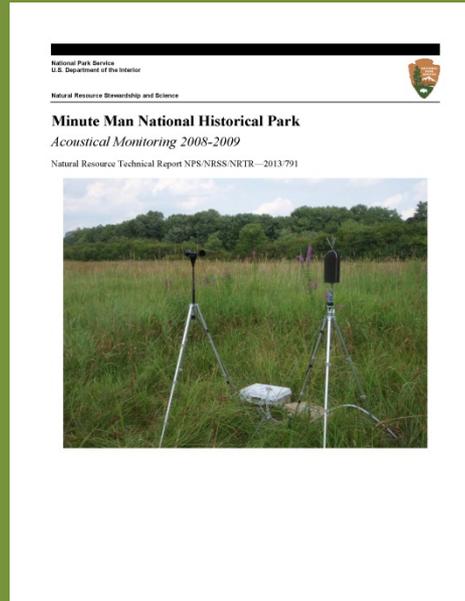
*\*usually requires another TAR*

# Acoustic Monitoring in Minute Man

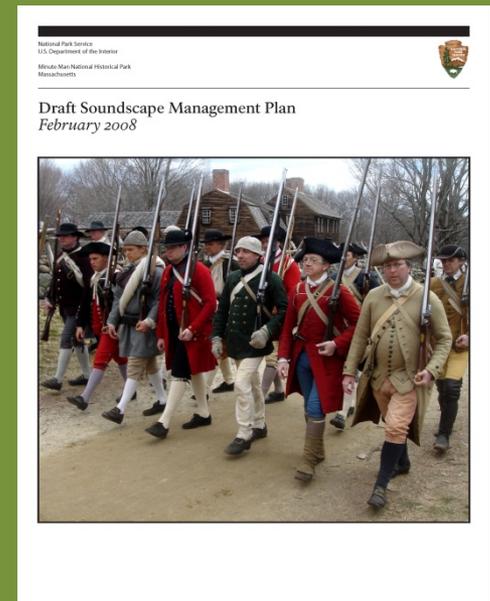
## Acoustic Monitoring



## Final Acoustic Report



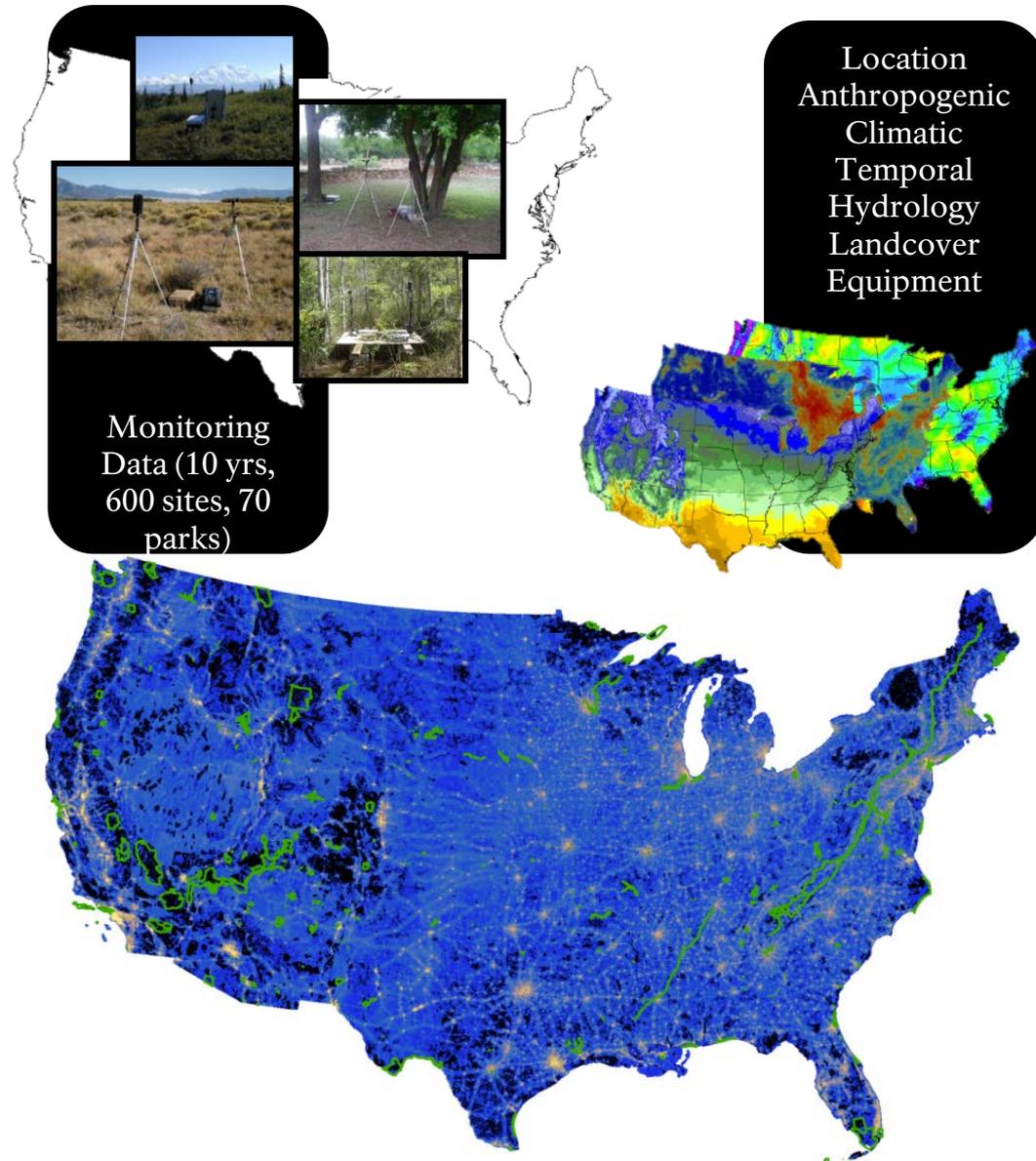
## Acoustic Resource Management Plan



# 2. Prediction of Acoustic Conditions

What it can tell you....

- PREDICTION of what an area will sound like based on what we KNOW about the location (roads, vegetation)
- predict natural, existing, and impact sound levels
- model is VERY ACCURATE. It has an error of +/- 3dB, same error as our monitoring equipment
- Predictions based on 10 + years of monitoring data in parks



# 2. Prediction of Acoustic Conditions

## Estimated timeline

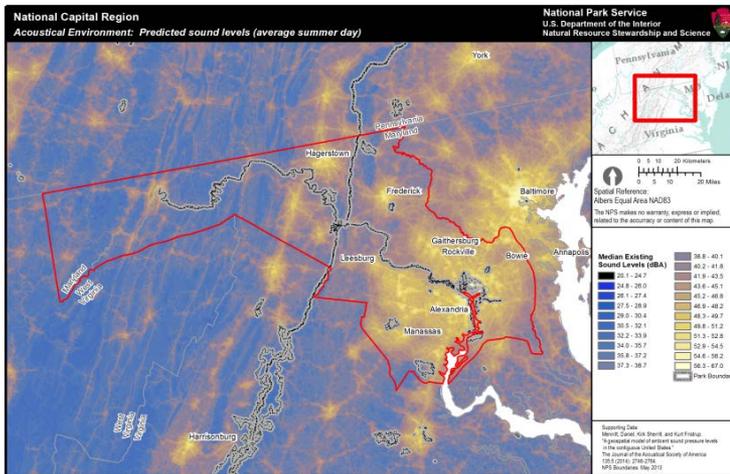
Create map  
(1 day)

Share results  
No standard report, but can provide presentation or details explanation

Use in park planning

State of the Parks Reports

- impact- difference between existing and natural sound levels
- NSNSD has generated impact results for 130 park units



Executive Summary table:

Acoustical Environment	↓	The mean L <sub>50</sub> Impact (L <sub>50</sub> dBA), a measure of noise contributed to the existing acoustical environment by anthropogenic sources, is 11.0 dBA in the urban section of the park and 10.4 dBA in the non-urban section of the park. Nationwide increases in ground-based and aircraft traffic indicates a downward trend in the quality of acoustic resources.
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Chapter 2 table:

Soundscapes	↓	web ▶
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Every unit in the national park system has a unique acoustic environment, and every unit should understand what its desired acoustic environment would be. The quality of the acoustic environment affects visitor experience and ecological function. Acoustic resource condition, both natural and cultural, should be evaluated in relation to visitor enjoyment, wilderness character, ecosystem health, and wildlife interactions. Based on these considerations and the character of the park, the acoustic resource condition at VAFO warrants significant concern under both urban and non-urban criteria. Learn more in the document Recommended Indicators for Acoustic Resource Quality (<https://irma.nps.gov/App/ReferenceProfile/2197837>), the NPS Natural Sounds and Night Skies Division website (<http://www.nature.nps.gov/sound/>), and Figure 1 and Figure 2 below.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
L <sub>50</sub> Impact	L <sub>50</sub> dBA - a measure of noise contributed to existing acoustical environment by anthropogenic sources.	↓	The mean L <sub>50</sub> Impact (L <sub>50</sub> dBA), calculated as difference between existing ambient and natural ambient models, is 11.0 dBA in the urban section of the park and 10.4 dBA in the non-urban section of the park. This indicates that the condition of the resource warrants significant concern under urban and non-urban criteria. Trend is deteriorating due to nationwide increases in ground-based (U.S. Federal Highway Administration, 2015) and aircraft traffic in recent decades (Federal Aviation Administration, 2010).

# 3. Model specific sources

What the results can tell you...

- Comparison of different scenarios for a specific sound source (*e.g. traffic route or composition*)
- Measurement what part of the park is impacted by sound
- Propose alternate scenarios

# 3. Model specific sources

## Estimated timeline

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### Gather model inputs

- (1 – 3 months)
- Boundaries
  - Noise source
  - Terrain, vegetation, temperature, humidity
  - Ambient noise levels

### Build and run model

- (1-2 months)
- Different modeling programs depending on the source (road vs aircraft)

### Visualize outputs

- (1 month)
- may require additional programming

### Generate impact metrics

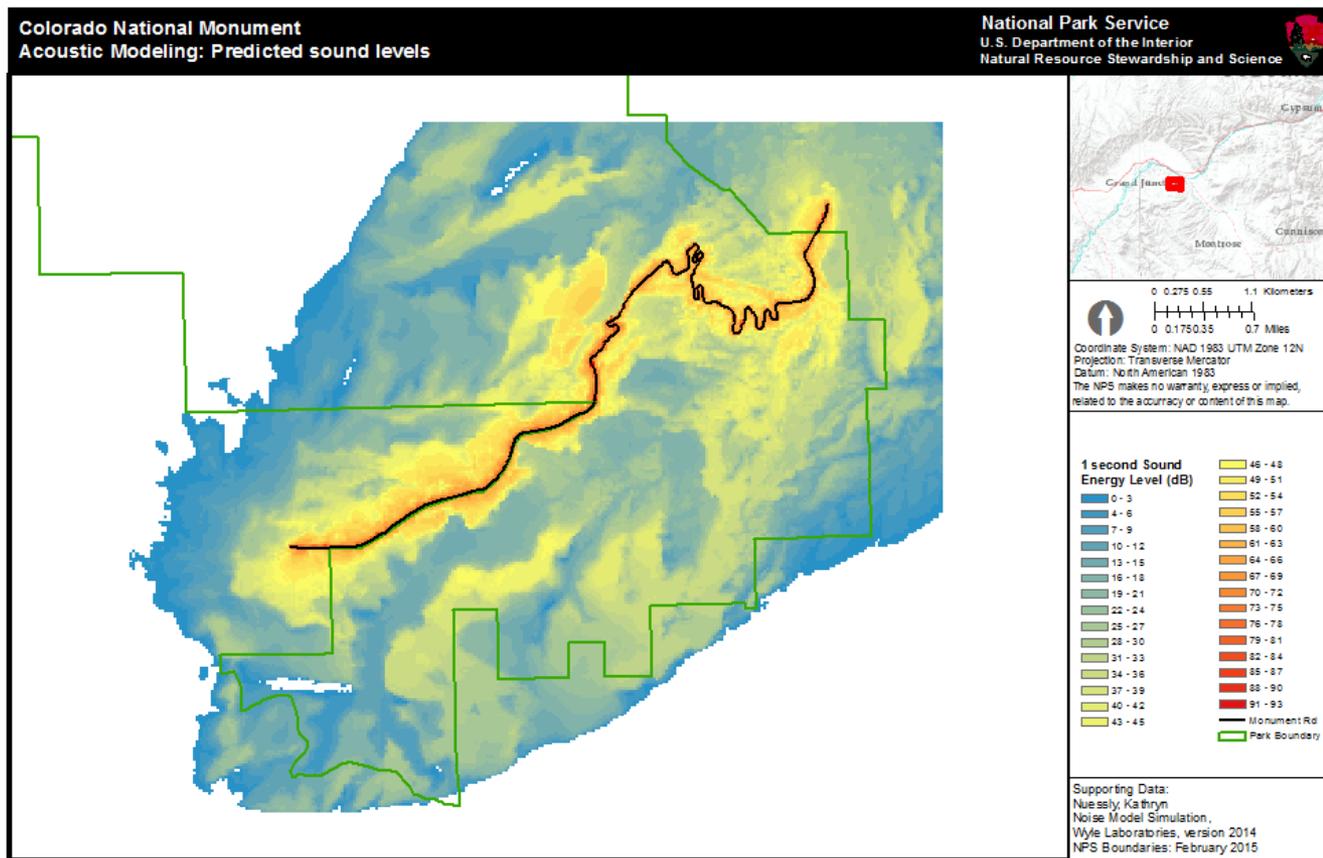
- requires discussion with the park to understand the resource of concern.
- NSNSD is working on impact metrics and documents to summarize the metrics.

### Products

- depends on park needs/questions

# Colorado National Monument

The park has an increase in road traffic.  
What is the acoustic impact on the park?



# 4. Assist with planning process

## Examples of planning documents...

- Air Tour Management Plans (e.g Big Cypress)
- Soundscape Plans (e.g. Zion, Glacier Bay)
- State of the Park Reports
- Wilderness Plans
- Natural Resource Condition Assessment Plans
- Foundation Documents

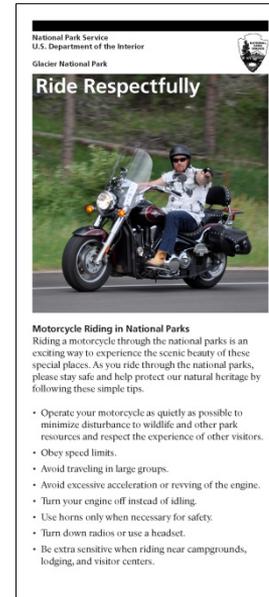
# 5. Wildlife or Visitor studies

- **Research question formulated by park**
  - e.g. Impacts of motorcycle event on wildlife, Arrival of migrant birds to park
- **Assist with**
  - experimental design
  - equipment development & deployment
  - Analysis (acoustic and stats)
  - reports or publications



# 6. Outreach & Events

- Ride Respectfully Campaign (e.g. *Grand Teton, Devils Tower, Glacier*)
- Bioblitz
- World Listening Day
- Materials: rack cards, games, ipad display, interp handbook



These are typical requests, but we can also assist with unique acoustic issues in parks...

(We also take TARs for Natural Lightscapes/Night Skies – contact bob\_meadows@nps.gov or jeremy\_m\_white@nps.gov for more info.)

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[www.nps.gov/nsnsd](http://www.nps.gov/nsnsd)



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