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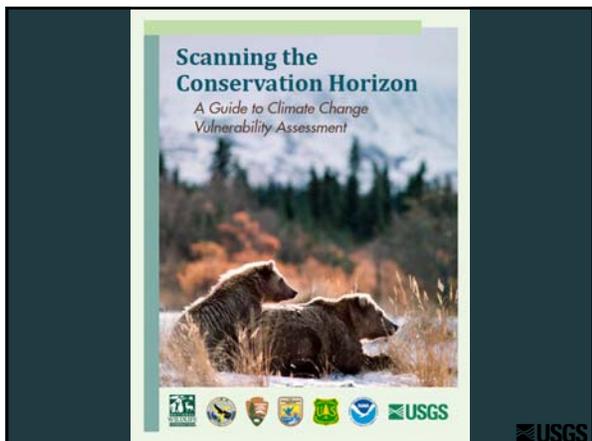
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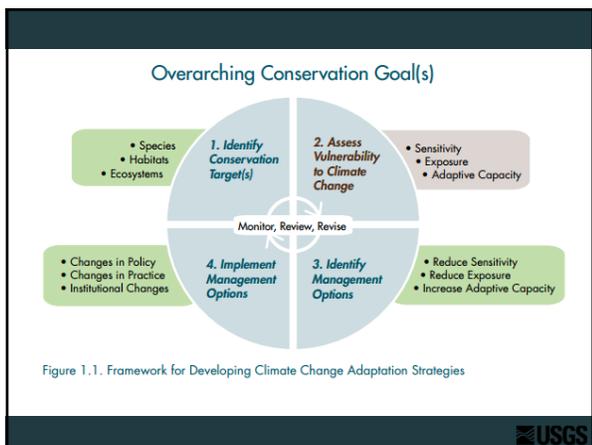


Figure 1.1. Framework for Developing Climate Change Adaptation Strategies

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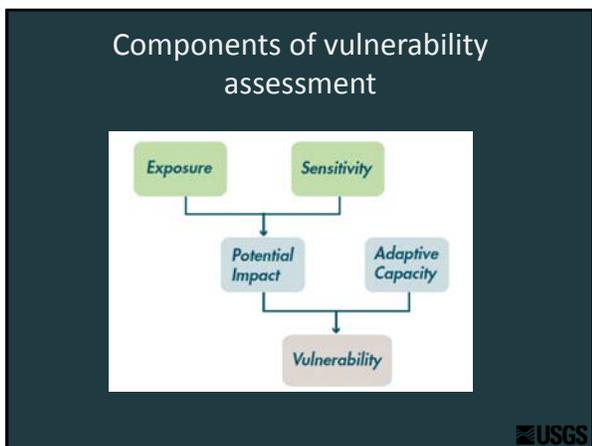
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### Data collection



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### Example projects

US FWS - Water Resource Inventory Assessments

Exploring historical temperature, precipitation, and stream flow trends and starting to look at future climate projections

- ✓ Exposure
- ✗ Sensitivity
- ✗ Adaptive capacity



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### Example projects

BLM – Radio-collaring of Canada lynx

Determine whether collared lynx prefer areas with snow cover

- ✗ Exposure
- ✓ Sensitivity
- ✗ Adaptive capacity



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### Example projects

US FWS - Coal reclamation potential in Chuitna watershed of Alaska

- Hydrological effects model to project precipitation changes on groundwater and stream flow ✓ Exposure
- Impacts of groundwater and stream flow changes on spawning of coho salmon ✓ Sensitivity
- Beginning to look into how coho salmon and other fish might adapt to those changes ✓ Adaptive capacity



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### Example projects

USGS/NPS – Impacts of climate change on Karner blue butterfly habitats

- Incorporated downscaled climate projections into a suite of climate envelope models (e.g., Maxent) ✓ Exposure
- Identified future habitat shifts from the species distribution models ✓ Sensitivity
- Considered potential macro climates that may allow the species to find optimal habitats close by ✓ Adaptive capacity



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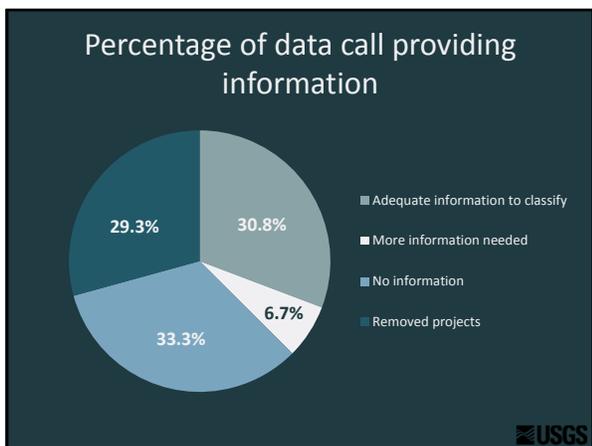
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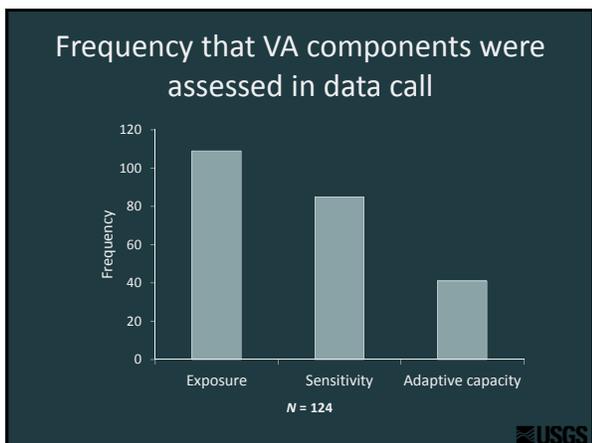
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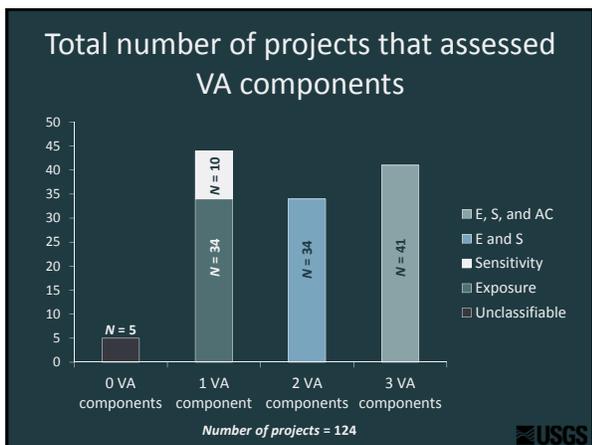
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	Focal resources					Total
	Freshwater supplies	Landscapes, including wildlife habitat	Native and cultural resources	Ocean health	More than 1 focal resource	
E	24	4	0	0	6	34
S	1	5	0	0	2	8
E and S	0	26	0	1	7	34
E, S, and AC	0	34	1	2	4	41
Unclassified	0	3	0	0	2	5
<b>Total</b>	<b>25</b>	<b>72</b>	<b>1</b>	<b>3</b>	<b>21</b>	<b>122</b>

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	Freshwater supplies	Landscapes, including wildlife habitat	Native and cultural resources	Ocean health	More than 1 focal resource	Total
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Total	25	72	1	3	21	122

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Focal threats						
	Invasive species	Wildfire risk	Sea-level rise	Melting ice/permafrost	More than 1 focal threat	Total
E	1	0	7	0	1	9
S	0	1	0	0	1	2
E and S	5	0	11	1	7	24
E, S, and AC	0	4	29	0	1	34
Unclassified	0	0	0	0	1	1
Total	6	5	47	1	11	70

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**Focal resources**



Freshwater resources   Landscapes, including wildlife habitat   Native and cultural resources   Ocean health

**Focal threats**



Invasive species   Wildfire risk   Sea-level rise   Melting ice/permafrost



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**Focal resources**



Freshwater resources   Landscapes, including wildlife habitat   **More VA work**   **More VA work**

**Focal threats**



**More VA work**   **More VA work**   Sea-level rise   **More VA work**



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**Focal resources**



Freshwater resources   **Adaptation planning**   **More VA work**   **More VA work**

**Focal threats**



**More VA work**   **More VA work**   **Adaptation planning**   **More VA work**



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**Focal resources**

 Slightly more VA work Freshwater resources	 Adaptation planning Landscapes, including wildlife habitat	 More VA work Native and cultural resources	 More VA work Ocean health
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**Focal threats**

 More VA work Invasive species	 More VA work Wildfire risk	 Adaptation planning Sea-level rise	 More VA work Melting ice/permafrost
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USGS

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**Caveats of study**

- Unstructured survey design
- Guidelines on conducting vulnerability assessments were relatively new

USGS

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### Future work

- Promote VA guidelines for informing climate change adaptation planning
- Develop scientific approach for tracking results of projects



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There is no way to know about VAs being conducted for different regions, species, or other ecological elements



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New assessments are being undertaken without knowledge of the methods or results of relevant ongoing or completed assessments



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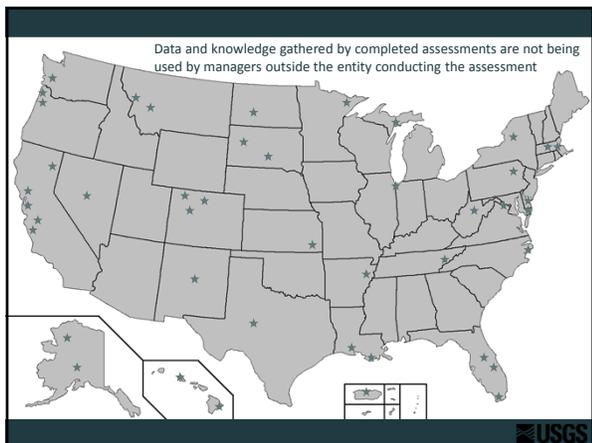
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### Vulnerability assessment registry

- Basic reporting elements
  - Contact information
  - Location
  - Assessment endpoint (target)
  - Vulnerability assessment methodology
  - Vulnerability assessment components
  - Large-scale drivers of change
  - Partners or collaborators
  - Link to a specific decision
  - Abstract

USGS

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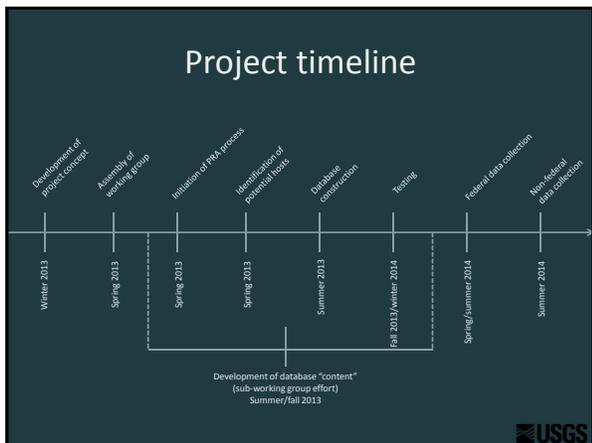
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