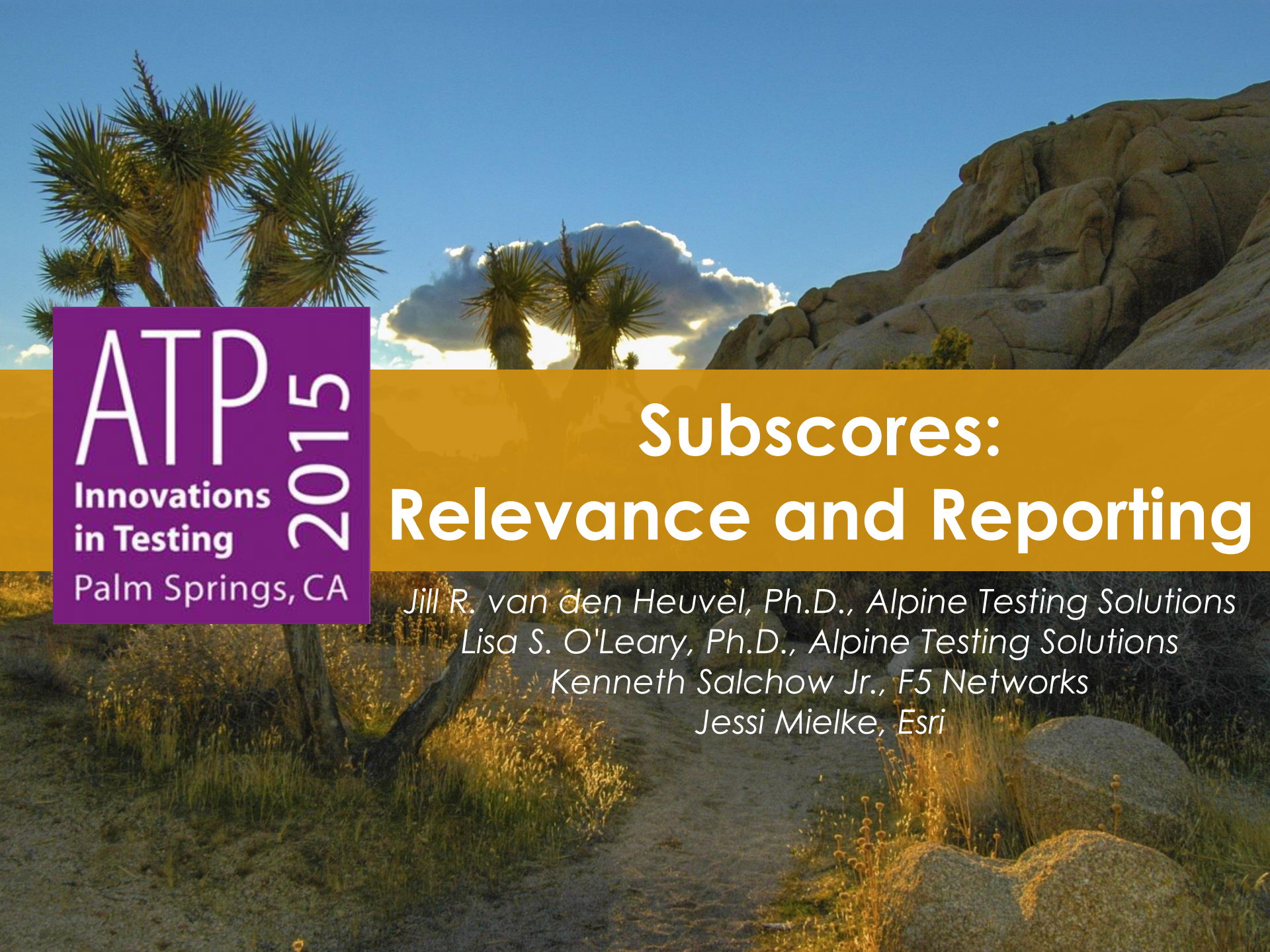


# Subscores: Relevance and Reporting

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# Introduction & Agenda

- Why, what, how of implementing subscore reporting?
- What are the considerations?
  - Program
  - Psychometric
  - Scoring

# Assessing Feasibility

- How should the scores be reported?
  - Score reporting best practices
  - Logistical implications
  - Studying for the exam versus gaining experience in the domain of knowledge
- Will the scores reported add value?
  - Perceived value
  - Psychometric value

# Communication

- "Communicating test score information matters. Stakeholders want to know what scores are and what they mean" (Hambleton & Zenisky, 2013, p.14).

- Context is needed for scores

# Report Design Process

- Clear and purposeful report development processes are necessitated by professional standards
  - Data Gathering
  - Build Reports
  - Feedback
  - Maintenance

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# Hambleton & Zenisky (2012)

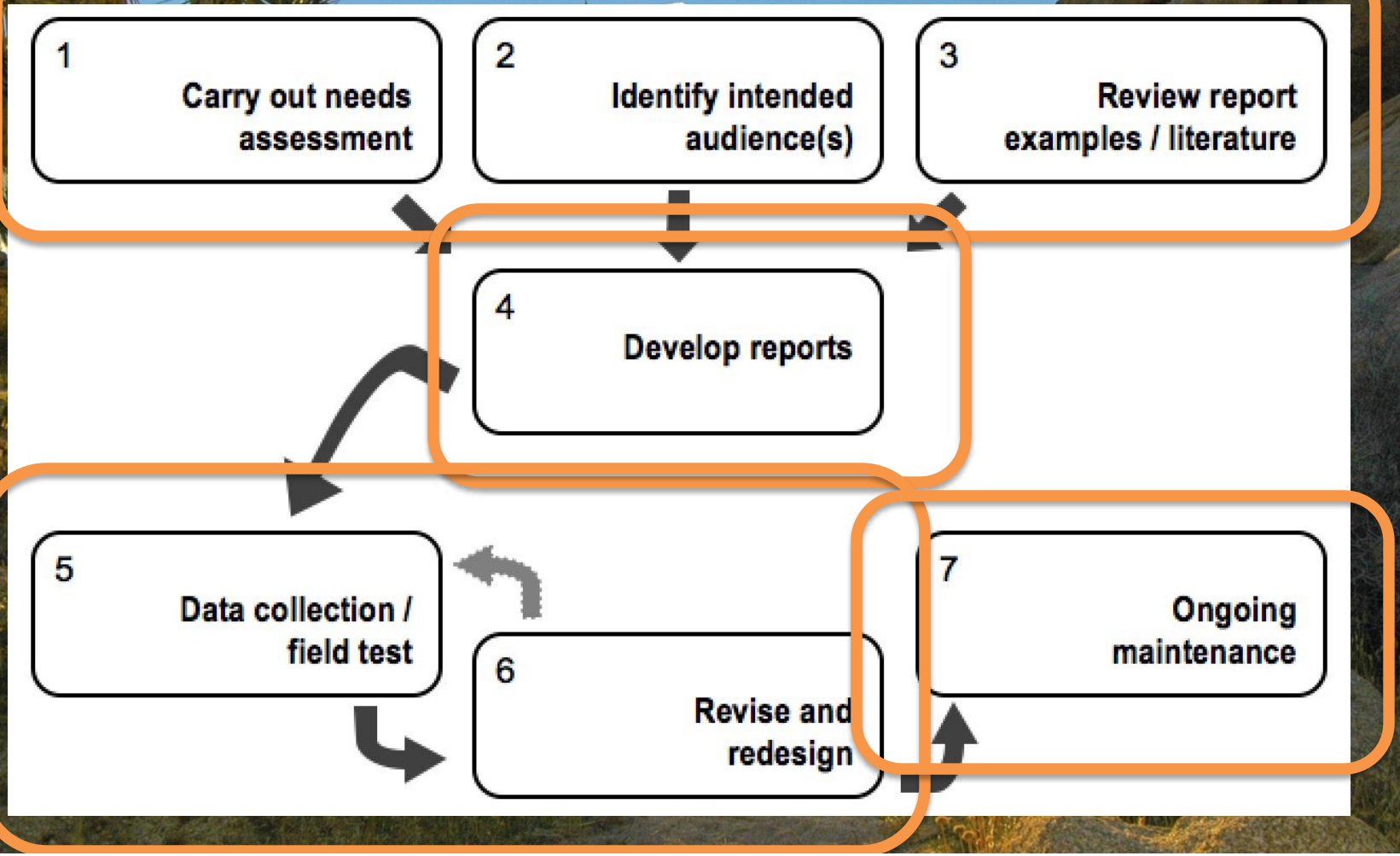


Figure used with permission from: Zenisky, A. L., & Hambleton, R. K. (2012). Developing test score reports that work: The process and best practices for effective communication. *Educational Measurement: Issues and Practice, 31* (2), 21–26.

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# Delivery Considerations

- Mechanism for reporting scores/performance
- Unique considerations
  - Online/computer
    - Static versus dynamic
    - Permitted access
  - Timing
    - Immediate
    - Delayed

# Will subscores add value?

- Perceived value
  - More information is better … right?
  - Candidates want to know what to study, especially if they failed
- Simple calculations to determine if subscores add value
  - Psychometric
  - Can provide a rationale for/against reporting

# Subscore Characteristics

- Subscores need to be:
  - Psychometrically sound
    - Reliability
    - Validity
    - Lacking potential misinterpretations
  - Valuable to stakeholders
    - Candidates
    - Employers
    - Program

# Statistical Value Added

- Simple calculations
  - Reliability
  - Numerical representation of value
- Allow for statements regarding why or why not subscores are reported
  - Empirical basis

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# Assessing Program Need

- How do you determine there is a need to move to reporting subscores?

- Contributing factors
  - Organizational change
  - Candidate needs
  - Program health
  - Other considerations

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# Preparing for Subscore Reports

- How do you prepare for subscore reporting?
  - Clear information regarding changes
  - Input from appropriate players

# Score Reports

- Version 0.0: Presents only exam-level results without section-level feedback

**ArcGIS Desktop Associate**

**Notice of Exam Results**

| | |
|---|---|
| Candidate: | Exam Testing date: |
| Candidate ID: | Exam ID: |
| Testing ID: | |
| Exam Registration ID (unique for each sitting): | |

We regret to inform you that you did not achieve the passing score required on the exam for ArcGIS Desktop Associate.

You may register to retake the examination or investigate additional training resources that will help you prepare.

# Subscore Score Reports

- Version 1.0: Presents same exam-level results but adds in section-level feedback related to expectations of the MQC

esri

**ArcGIS Desktop Associate**
**Notice of Exam Results**

The information in the table below details the composition of the EADA exam and your performance in each of its **8 content sections**. The table includes the percentage of the test that was devoted to each content area and classifications of your section-level performance as characteristic of one of three levels of performance - meets, borderline, or below minimum competence:

**Meets:** Performance at this level demonstrates that expected of a minimally qualified candidate (MQC).
**Borderline:** Performance at this level is around, plus or minus error, that expected of a MQC.
**Below:** Performance at this level falls below that expected of a MQC.

| Section | Percent of Scored Items | Score Performance Level | | |
|---|---|---|---|---|
| | | Below | Borderline | Meets |
| 1 ArcGIS Awareness | 5% | | | x |
| 2 Coordinate System (Spatial Reference) Awareness | 9% | | x | |
| 3 Managing Data in ArcGIS Desktop | 25% | x | | |
| 4 Analyzing Data in ArcGIS Desktop | 16% | | x | |
| 5 Editing Data in ArcGIS Desktop | 10% | x | | |
| 6 Visualizing Data in ArcGIS Desktop | 22% | | x | |
| 7 Geoprocessing in ArcGIS Desktop | 4% | | | x |
| 8 Sharing Content from ArcGIS Desktop | 8% | | | x |

# Subscore Score Reports

- Version 1.0: For test-level exam development, performance ranges, descriptions of performance, and disclaimers are key

esri

**ArcGIS Desktop Associate**
**Notice of Exam Results**

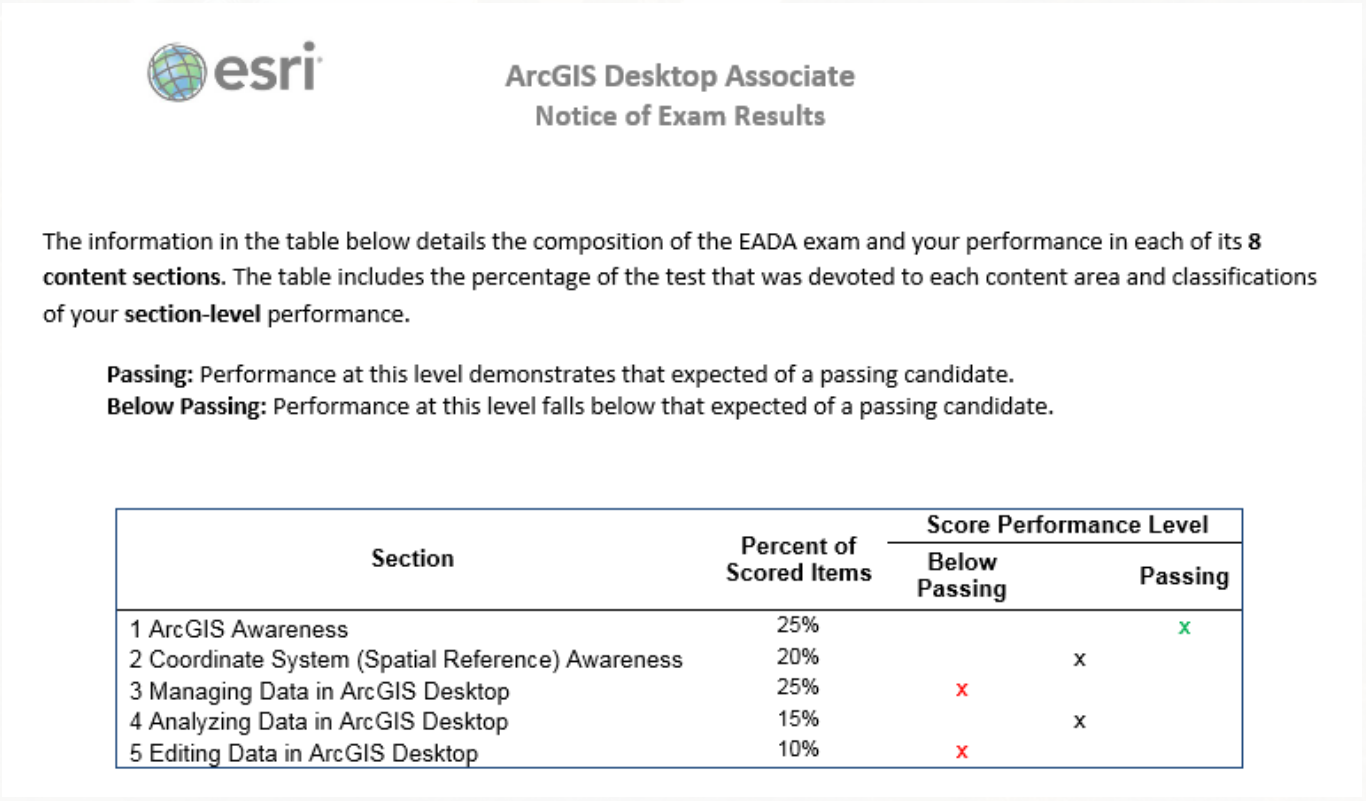
The information in the table below details the composition of the EADA exam and your performance in each of its **8 content sections**. The table includes the percentage of the test that was devoted to each content area and classifications of your section-level performance as characteristic of one of three levels of performance - meets, borderline, or below minimum competence:

**Meets:** Performance at this level demonstrates that expected of a minimally qualified candidate (MQC).
**Borderline:** Performance at this level is around, plus or minus error, that expected of a MQC.
**Below:** Performance at this level falls below that expected of a MQC.

| Section | Percent of Scored Items | Score Performance Level | | |
|---|---|---|---|---|
| | | Below | Borderline | Meets |
| 1 ArcGIS Awareness | 5% | | | x |
| 2 Coordinate System (Spatial Reference) Awareness | 9% | | x | |
| 3 Managing Data in ArcGIS Desktop | 25% | x | | |
| 4 Analyzing Data in ArcGIS Desktop | 16% | | x | |
| 5 Editing Data in ArcGIS Desktop | 10% | x | | |
| 6 Visualizing Data in ArcGIS Desktop | 22% | | x | |
| 7 Geoprocessing in ArcGIS Desktop | 4% | | | x |
| 8 Sharing Content from ArcGIS Desktop | 8% | | | x |

# Subscore Score Reports

- Version 2.0: Presents descriptive feedback to candidates on range of estimated section-level passing performance based on cut score



esri

ArcGIS Desktop Associate
Notice of Exam Results

The information in the table below details the composition of the EADA exam and your performance in each of its **8 content sections.** The table includes the percentage of the test that was devoted to each content area and classifications of your **section-level** performance.

**Passing:** Performance at this level demonstrates that expected of a passing candidate.
**Below Passing:** Performance at this level falls below that expected of a passing candidate.

| Section | Percent of Scored Items | Score Performance Level | |
|---|---|---|---|
| | | Below Passing | Passing |
| 1 ArcGIS Awareness | 25% | | x |
| 2 Coordinate System (Spatial Reference) Awareness | 20% | x | |
| 3 Managing Data in ArcGIS Desktop | 25% | x | |
| 4 Analyzing Data in ArcGIS Desktop | 15% | x | |
| 5 Editing Data in ArcGIS Desktop | 10% | x | |

# Subscore Score Reports

- Version 2.0: Performance ranges adjusted to pass/fail likelihood, middle category label removed, and disclaimer reformatted to lessen candidate confusion

esri ArcGIS Desktop Associate

Disclaimer: The EADA exam was designed for the total test scores to be used to make pass/fail decisions. As such, steps were taken during the test development process to support test-level performance reporting. Confidence can therefore be placed in the overall pass/fail designation as it represents the determination of candidates' knowledge, skills, and abilities at the **test-level**.

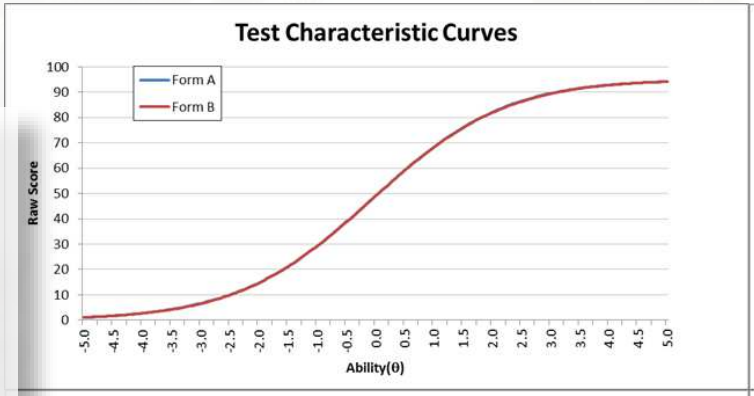
The classifications of section-level performance are provided as **descriptive feedback only**, as the EADA exam was not designed with the intent to provide this feedback. No pass/fail decisions are made based on candidates' section-level scores as steps were not taken during the test development process to support section-level reporting. As such, performance classifications at this level of specificity may not be reliable. Candidates should exercise caution when interpreting the above section-level score information as it is not intended to be used to guide future test preparation.

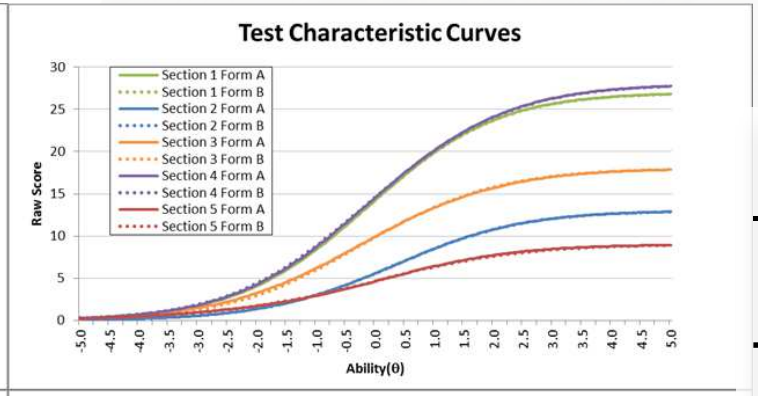
| | | | |
|---|---|---|---|
| 2 Coordinate System (Spatial Reference) Awareness | 20% | | x |
| 3 Managing Data in ArcGIS Desktop | 25% | x | |
| 4 Analyzing Data in ArcGIS Desktop | 15% | | x |
| 5 Editing Data in ArcGIS Desktop | 10% | x | |

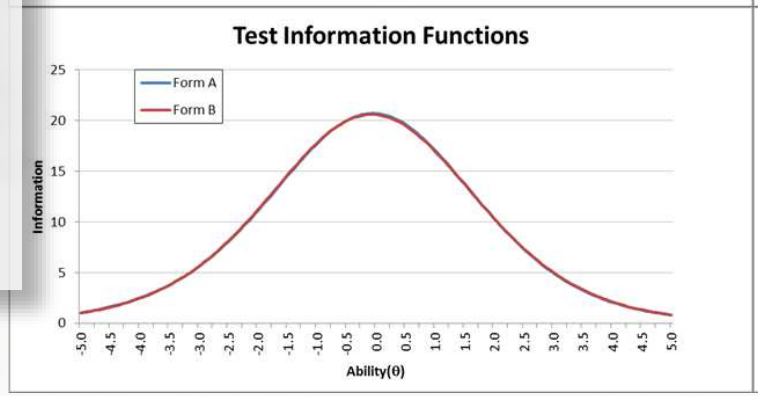
# Section-Level Development Detour

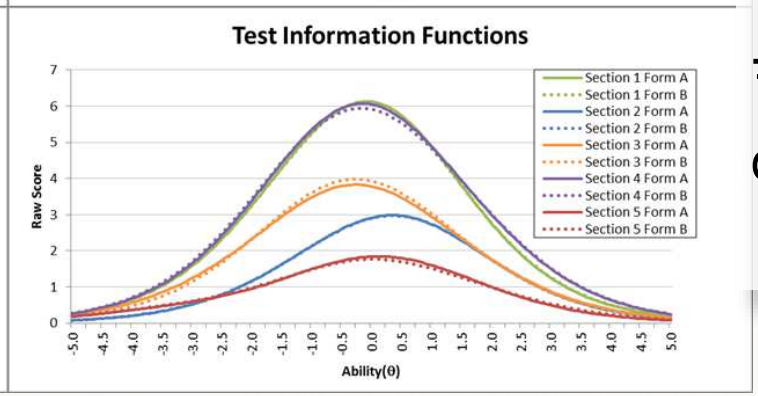
- Pre-equate at the section-level to ensure fair and consistent scoring and comparability of test scores across different forms

Exam-Level




Section-Level

# Section-Level Development Detour

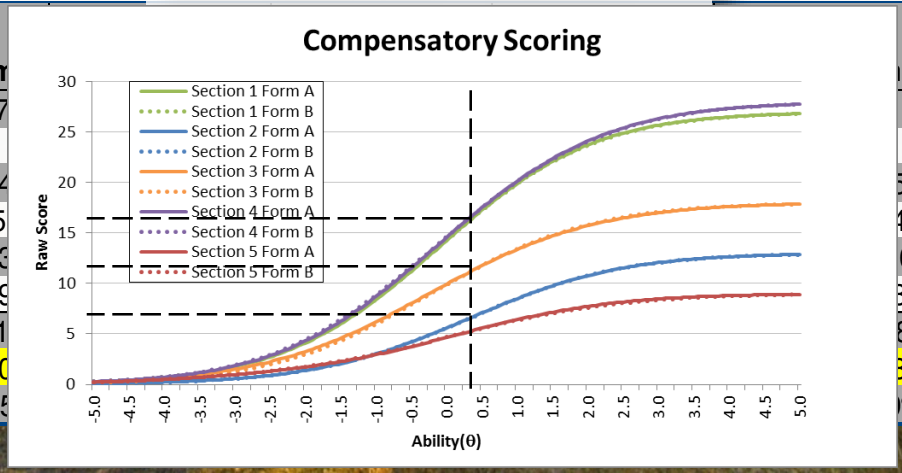
- Build and balance at the section-level during forms assembly to allow for future section-specific updates and diagnostic feedback

## Exam-Level

| | Form A | Form B |
|---|---|---|
| Number of items | 95 | 95 |
| | | |
| Mean | 56.54 | 56.66 |
| Standard deviation | 16.40 | 16.54 |
| Alpha Reliability | 0.93 | 0.93 |
| Average Test Time (minutes) | 86.20 | 85.63 |
| Estimated number correct at target cut score | 58.42 | 58.40 |
| Percent correct at target cut score | 61.49% | 61.47% |

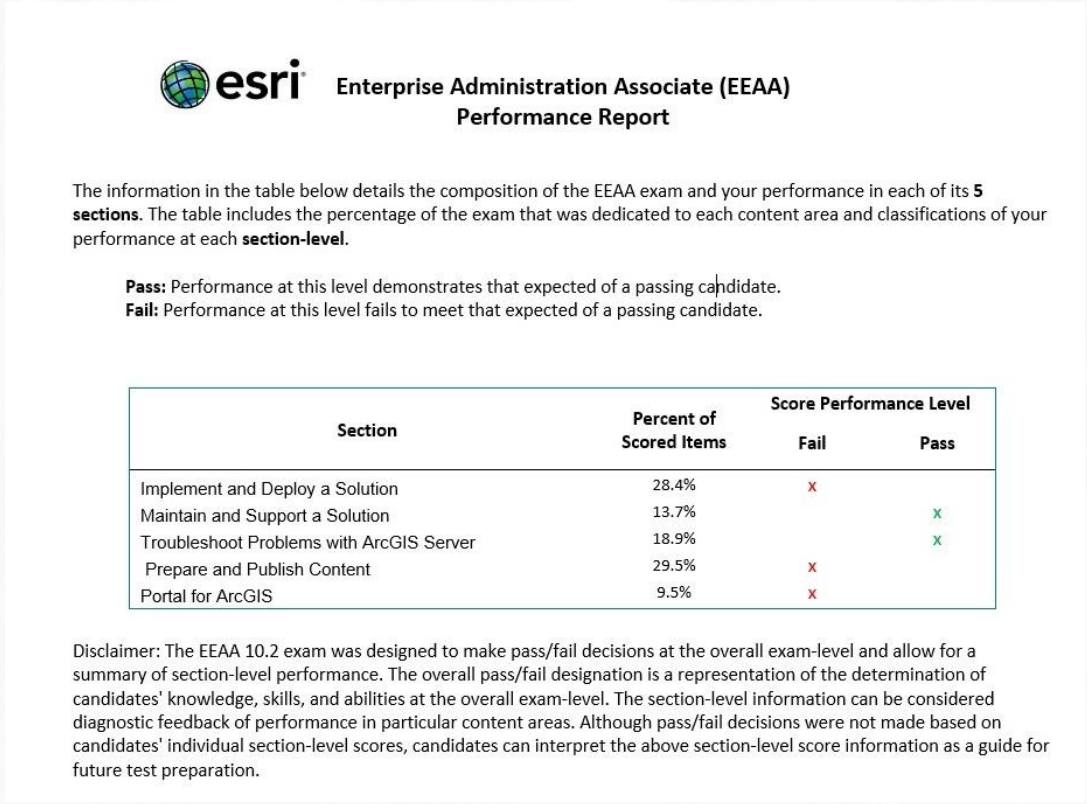
## Section-Level

| | Section 1 | |
|---|---|---|
| Stats | Form A | Form |
| Number of items | 27 | 27 |
| | | |
| Mean | 16.44 | 16.4 |
| Standard deviation | 5.36 | 5.5 |
| Alpha Reliability | 0.821 | 0.83 |
| Average Test Time (minutes) | 26.93 | 25.9 |
| Average Item Measure | -0.13 | -0.1 |
| Estimated number correct at target cut score | 17.03 | 17.0 |
| Percent correct at target cut score | 63.06% | 63.05 |



# Subscore Score Reports

- Version 3.0: Presents diagnostic feedback to candidates on equated section-level pass/fail performance based on cut score



esri **Enterprise Administration Associate (EEAA) Performance Report**

The information in the table below details the composition of the EEAA exam and your performance in each of its **5 sections**. The table includes the percentage of the exam that was dedicated to each content area and classifications of your performance at each **section-level**.

**Pass:** Performance at this level demonstrates that expected of a passing candidate.
**Fail:** Performance at this level fails to meet that expected of a passing candidate.

| Section | Percent of Scored Items | Score Performance Level | |
|---|---|---|---|
| | | Fail | Pass |
| Implement and Deploy a Solution | 28.4% | x | |
| Maintain and Support a Solution | 13.7% | | x |
| Troubleshoot Problems with ArcGIS Server | 18.9% | | x |
| Prepare and Publish Content | 29.5% | x | |
| Portal for ArcGIS | 9.5% | x | |

Disclaimer: The EEAA 10.2 exam was designed to make pass/fail decisions at the overall exam-level and allow for a summary of section-level performance. The overall pass/fail designation is a representation of the determination of candidates' knowledge, skills, and abilities at the overall exam-level. The section-level information can be considered diagnostic feedback of performance in particular content areas. Although pass/fail decisions were not made based on candidates' individual section-level scores, candidates can interpret the above section-level score information as a guide for future test preparation.

# Subscore Score Reports

- Version 3.0: For section-level development, true passing categories and minimized disclaimer

esri **Enterprise Administration Associate (EEAA)**
**Performance Report**

The information in the table below details the composition of the EEAA exam and your performance in each of its **5 sections**. The table includes the percentage of the exam that was dedicated to each content area and classifications of your performance at each **section-level**.

**Pass:** Performance at this level demonstrates that expected of a passing candidate.
**Fail:** Performance at this level fails to meet that expected of a passing candidate.

| Section | Percent of Scored Items | Score Performance Level | |
|---|---|---|---|
| | | Fail | Pass |
| Implement and Deploy a Solution | 28.4% | x | |
| Maintain and Support a Solution | 13.7% | | x |
| Troubleshoot Problems with ArcGIS Server | 18.9% | | x |
| Prepare and Publish Content | 29.5% | x | |
| Portal for ArcGIS | 9.5% | x | |

Disclaimer: The EEAA 10.2 exam was designed to make pass/fail decisions at the overall exam-level and allow for a summary of section-level performance. The overall pass/fail designation is a representation of the determination of candidates' knowledge, skills, and abilities at the overall exam-level. The section-level information can be considered diagnostic feedback of performance in particular content areas. Although pass/fail decisions were not made based on candidates' individual section-level scores, candidates can interpret the above section-level score information as a guide for future test preparation.

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# Take-Aways

- Physical handout with references
  - Score reporting
  - Subscore value
- Score reporting (subscores or total) must:
  - Be a planned process
  - Be communicated well
  - Have value for all involved parties


# Thank You!

*Jill R. van den Heuvel, Ph.D., Alpine Testing Solutions*
*Lisa S. O'Leary, Ph.D., Alpine Testing Solutions*
*Kenneth Salchow Jr., F5 Networks*
*Jessi Mielke, Esri*