Accessiblü

Managed Digital Accessibility Ops

Accessibility Evaluation Report:

American Association for the Advancement of Science (AAAS)/Science

September 30, 2025

Conducted by: Accessiblü, LLC

For: Library Accessibility Alliance (LAA)

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Summary of Accessibility Findings

Accessiblü conducted a high-level accessibility evaluation of the American Association for the Advancement of Science (AAAS) Science Archive platform to assess its usability for individuals with disabilities. The review was conducted using the JAWS and NVDA screen readers, keyboard-only navigation, and manual inspection for conformance to select WCAG 2.2 AA success criteria.

Key Findings

The AAAS Science Archive platform presents significant accessibility challenges, creating barriers for users with disabilities. During our testing, we encountered numerous critical issues that prevented users from effectively navigating the archive, searching for scientific articles, and accessing published research. These issues severely impact the ability of screen reader users and keyboard-only users to use the platform effectively.

The testing revealed issues such as missing landmark regions, unlabeled images, keyboard traps, inconsistent heading structures, improperly coded ARIA attributes, and inaccessible search functionality. These problems not only hinder platform usability but often render essential functionality entirely inaccessible for people with disabilities.

Addressing these concerns would significantly improve the experience for persons with disabilities and users of assistive technology, allowing them to access the wealth of scientific research that the AAAS platform provides.

Top 3 Issues Identified

1. **Missing and Incorrectly Labeled Landmark Regions**
    a. The platform lacks a main landmark region entirely, and multiple navigation and footer regions share identical labels, making efficient page navigation impossible.
    b. Impact: Screen reader users cannot efficiently navigate the page structure or understand the organization of content. Users who rely on landmark navigation become disoriented and cannot quickly move between major sections of the page.
    c. WCAG Success Criteria: 1.3.1 Info and Relationships (A), 2.4.1 Bypass Blocks (A), 4.1.2 Name, Role, Value (A)

2. **Missing Alternative Text for Images**
    a. Journal cover images, logos, and graphical elements throughout the platform lack meaningful alternative text. Some images are announced only with filenames or dates rather than descriptive content.

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b. Impact: Screen reader users cannot access the visual information conveyed by images, including journal identification, article covers, and navigational graphics. This severely limits their ability to understand the content and context of search results and articles.
c. WCAG Success Criteria: 1.1.1 Non-text Content (A)

3. **Keyboard Traps and Missing State Announcements**
   a. Expandable menus, accordion buttons, and search panels trap keyboard focus. Users must press the Escape key to exit these elements, but this is not communicated programmatically. Additionally, expanded/collapsed states are not consistently announced.
   b. Impact: Keyboard-only users become trapped in interface elements and cannot proceed without specialized knowledge. Screen reader users cannot determine whether accordions are expanded or collapsed, creating confusion about the current state of the interface.
   c. WCAG Success Criteria: 2.1.2 No Keyboard Trap (A), 4.1.2 Name, Role, Value (A)

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Disabilities Impacted

Blind and Low-Vision Users

- **Issues:** Missing alternative text for images, absence of main landmark region, multiple regions with identical labels, inconsistent heading structures, unlabeled interactive elements, keyboard traps, missing state announcements for expandable controls, and inaccessible search functionality.
- **Impact:** Screen reader users are unable to understand visual content, navigate efficiently using landmarks, or comprehend the document structure. The platform fails to communicate dynamic changes, expanded/collapsed states, or search results, creating extreme confusion and preventing the completion of basic tasks like searching for articles or accessing research content.

Users with Motor Disabilities

- **Issues:** Keyboard traps in expandable menus and accordion controls, unpredictable focus management, buttons mislabeled as links, and search refinements that move focus unexpectedly to the top of the page.
- **Impact:** Keyboard-only users become trapped in certain UI components and must discover through trial and error that the Escape key provides the only exit. Focus moving unexpectedly after interactions forces users to repeatedly navigate through content they've already passed, creating significant frustration and inefficiency.

Neurodiverse Users

- **Issues:** Inconsistent UI patterns, unpredictable behavior when activating controls, lack of feedback when actions are taken, confusing tab panels that aren't announced, and search functionality that doesn't communicate results or status changes.
- **Impact:** Users with cognitive disabilities struggle to develop a mental model of how the interface works due to inconsistent patterns and behavior. The lack of clear feedback and status updates creates additional cognitive load, making the platform difficult or impossible to use independently.

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Page-Specific Findings and Impact Analysis

The following section lists the accessibility findings by page and WCAG violations and describes their impact on users.

Archive Landing Page

Issue	WCAG Success Criteria	Description	Example
Missing Main Landmark Region	**2.4.1 Bypass Blocks (A), 1.3.1 Info and Relationships (A)**	The page has no main landmark region identified, making it impossible for screen reader users to navigate directly to the primary content.	No <main> element or role="main" is present on the page. Screen readers cannot use the "M" shortcut key to navigate to main content.
Multiple Regions with Identical Labels	**4.1.2 Name, Role, Value (A), 2.4.1 Bypass Blocks (A)**	Three navigation regions and two footer regions all share the same generic labels, providing no distinguishing information.	All navigation regions are announced as "Navigation Region" with no unique identifiers. Users cannot determine which navigation element they're accessing.
Missing Alternative Text	**1.1.1 Non-text Content (A)**	Journal cover images, the Science logo, and other graphics lack meaningful alternative text.	Journal cover images are announced only with dates like "September 25th, Volume 389" without describing the image content or identifying them as journal covers. The Science logo is announced as "Graphic logo. To get missing image description."
Inconsistent Heading Structure	**1.3.1 Info and Relationships (A), 2.4.6 Headings and Labels (AA)**	Heading levels skip from H1 to H2 to H5, violating the logical hierarchy.	The page jumps from "Archive" (H1) to "2025" (H2) to "Volume 389
Keyboard Traps in Accordion Controls	**2.1.2 No Keyboard Trap (A)**	The Journals, Commentary, and About accordion buttons trap keyboard focus when expanded, requiring the Escape key to exit.	Activating the "Journals" button expands a menu, but users cannot collapse it using standard keyboard navigation. Only pressing Escape (which is not announced) closes the menu.

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Impact Summary:

The Archive Landing Page creates significant barriers for screen reader users who cannot efficiently navigate the page due to missing landmark regions and improperly labeled navigation areas. The inconsistent heading structure prevents users from understanding the document hierarchy, while missing alternative text on journal covers leaves users unable to identify or distinguish between different journal issues. Keyboard-only users become trapped in expandable menus, unable to proceed without discovering through trial and error that the Escape key is required—information that is never communicated to them programmatically.

Archive Landing Page Screenshot

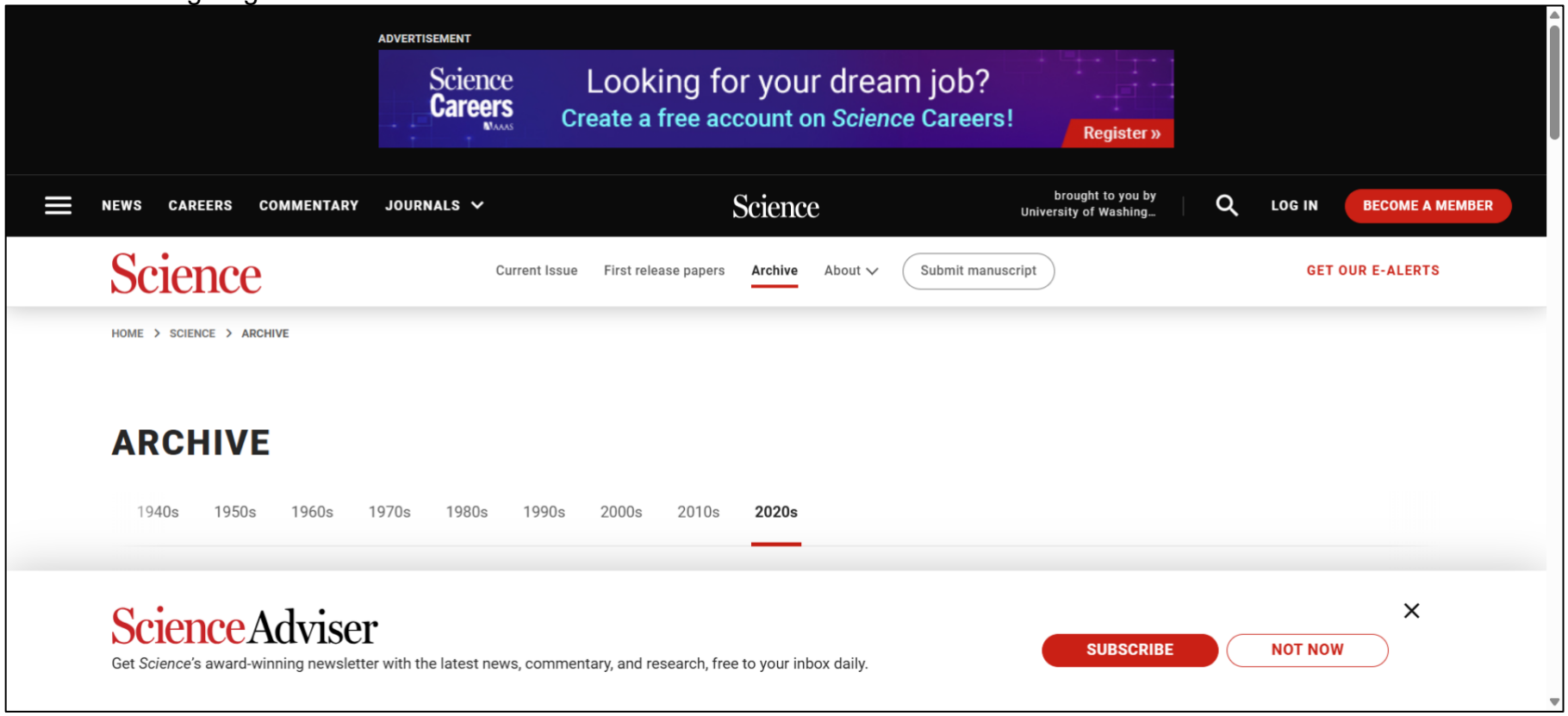

Figure 1. The Science Archive landing page displays journal issues organized by decade and year tabs, with cover images arranged chronologically.

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Search Results Page

Issue	WCAG Success Criteria	Description	Example
Search Results Not Announced	**4.1.3 Status Messages (AA)**	When a search is performed, the number of results found is not announced to screen readers, and focus moves unpredictably.	After searching for "glaciers," the page updates to show 10,000 results, but this information is not communicated to screen reader users. Users hear "1 slash 6, 2 slash 6" instead of the actual result count.
Unlabeled Search Button	**4.1.2 Name, Role, Value (A), 2.4.6 Headings and Labels (AA)**	The main search button at the top of the page is announced as "Same page link collapsed" with no accessible name or proper role.	The search activation control is identified as a link rather than a button and has no label indicating its purpose as a search function.
Buttons Mislabeled as Links	**4.1.2 Name, Role, Value (A)**	Interactive elements like "Login," "Become a Member," and "Donate" are coded as links when they should be buttons.	Elements that trigger actions rather than navigate to new pages are announced as "Link login" and "Link become a member" instead of buttons.
Context-Free "Add to Reading List" Buttons	**2.4.6 Headings and Labels (AA)**	Multiple identical "Add to Reading List" buttons appear throughout search results without distinguishing which article they reference.	Each search result has an "Add to Reading List" button, but all are announced identically, providing no context about which article will be added.
Unpredictable Focus Management	**2.4.3 Focus Order (A), 3.2.2 On Input (A)**	After refining search results or selecting filters, focus jumps unexpectedly to the top of the page rather than remaining in context.	When a user selects "20 results per page," the page refreshes and focus returns to the top, forcing the user to navigate back through all content to their previous location.

Impact Summary:

The search functionality, which is core to the platform's purpose, is largely inaccessible to screen reader users. The inability to hear search result counts, combined with unpredictable focus management and unlabeled controls, makes it extremely difficult for users with disabilities to search effectively. The numerous identical "Add to Reading List" buttons create confusion about which article is being referenced. Users must navigate away from results and back repeatedly due to focus management issues, creating an inefficient and frustrating experience.

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Search Results Page Screenshot

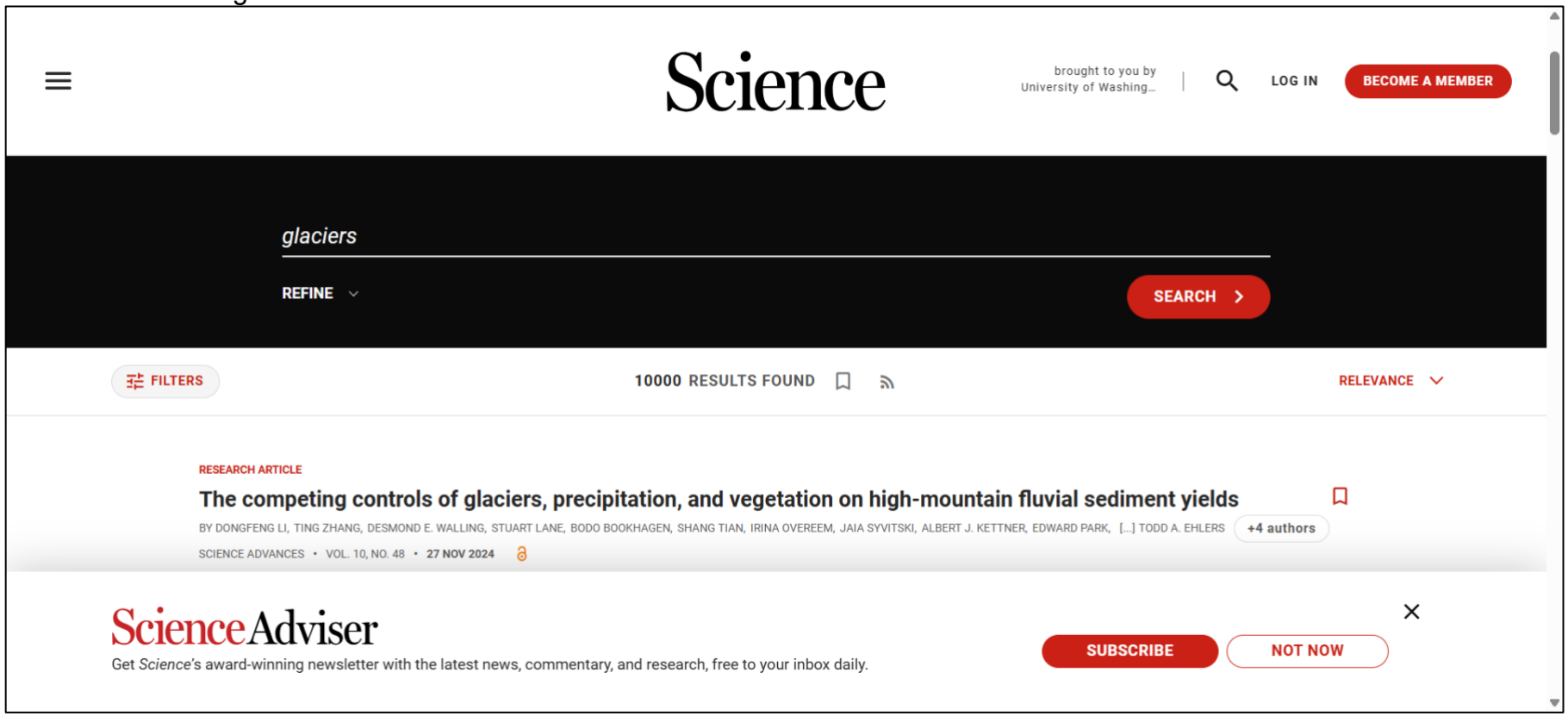

Figure 2. The search results page after searching for "glaciers" shows 10,000 results with filtering options and article listings..

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Article Landing Page

Issue	WCAG Success Criteria	Description	Example
Images Without Alternative Text	**1.1.1 Non-text Content (A)**	Images embedded within articles, including graphics and illustrations, lack alternative text entirely.	Graphics showing arctic sea ice and glacier imagery are announced only as "Arctic Sea Graphic" or "Hannah Richter Graphic" without any descriptive content.
Illogical Content Order	**1.3.2 Meaningful Sequence (A), 2.4.3 Focus Order (A)**	The reading order moves from the title to the cover image to social media links before presenting the actual article content.	Screen readers encounter social sharing buttons and sidebar content before reaching the article body, disrupting the logical flow of information.
Buttons Mislabeled as Links	**4.1.2 Name, Role, Value (A)**	The Table of Contents control is coded as a link when it functions as an expandable button.	The element is announced as "Link table of contents" but activating it expands a menu rather than navigating to a new page.
Missing Main Landmark	**1.3.1 Info and Relationships (A), 2.4.1 Bypass Blocks (A)**	Like other pages, the article page lacks a main landmark region.	Screen reader users cannot use landmark navigation to skip directly to the article content.
Inconsistent Heading Structure	**1.3.1 Info and Relationships (A)**	Headings skip from H2 to H4, and some content uses H4 headings inappropriately.	The page jumps from the article subtitle (H2) to "Sign up for the award-winning ScienceAdvisor Newsletter" (H4) at the bottom, skipping H3.

Impact Summary:

Article pages contain critical research content but are largely inaccessible to screen reader users due to missing alternative text on scientific graphics and illustrations. The illogical content order forces users to navigate through social sharing options and sidebar elements before reaching the actual article text, creating confusion about the page structure. Without alternative text on embedded images, visually impaired users cannot access the scientific data and illustrations that are often essential to understanding the research findings.

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Article Page Screenshot

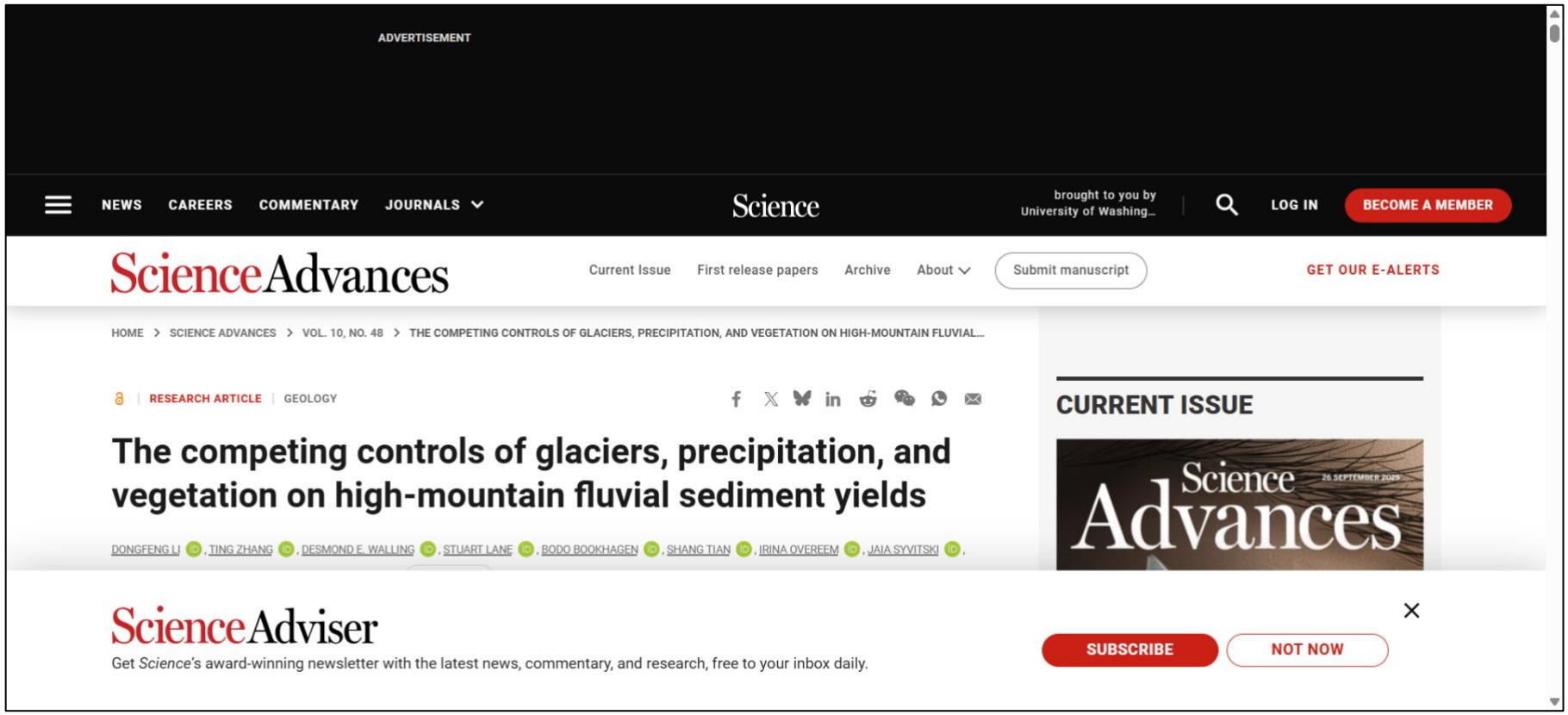

Figure 3. An individual article page displaying a research article about glaciers with navigation, content, and sidebar elements.

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Advanced Search Page

Issue	WCAG Success Criteria	Description	Example
Tab Panel Not Announced	**4.1.2 Name, Role, Value (A)**	Users can navigate to tabs for "Advanced Search," "Citation Search," "Search History," and "Saved Searches," but when entering a tab panel, it is not announced as such.	After activating the "Advanced Search" tab, users enter the tab panel content, but the screen reader provides no indication that they're now in a tab panel context.
Text Field Mislabeled as Combo Box	**4.1.2 Name, Role, Value (A)**	The "Published in" field is announced as "edit combo collapsed" when it is actually a simple text input field.	The screen reader announces "Published in colon edit combo collapsed" for a field that should be a standard text input, creating confusion about the expected interaction.
Radio Button State Not Announced	**4.1.2 Name, Role, Value (A)**	When selecting the "Last" radio button for publication date filtering, the checked state is not immediately announced.	After activating the "Last" radio button, users receive no confirmation that the selection was made. Only when navigating away and returning do they hear "Last radio button checked."
Keyboard Trap in Filter Controls	**2.1.2 No Keyboard Trap (A)**	Expanding dropdown filters traps keyboard focus, requiring the Escape key to exit.	When users expand the "Article type" filter menu, they cannot collapse it using standard keyboard navigation and must press Escape, which is not communicated to them.
Multiple Regions with Identical Labels	**4.1.2 Name, Role, Value (A)**	Like other pages, multiple navigation regions share the same label.	Three separate navigation regions are all announced as "Navigation Region" with no distinguishing information.

Impact Summary:

The Advanced Search functionality, which should allow users to precisely filter research articles, is largely inaccessible due to improperly coded form controls and missing state announcements. Screen reader users cannot determine which form elements are active, whether their selections have been registered, or understand the structure of tab panels. The mislabeling of text fields as combo boxes creates confusion about expected interactions, while keyboard traps prevent efficient navigation. These barriers effectively exclude users with disabilities from using one of the platform's core features for finding relevant research.

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Advanced Search Page Screenshot

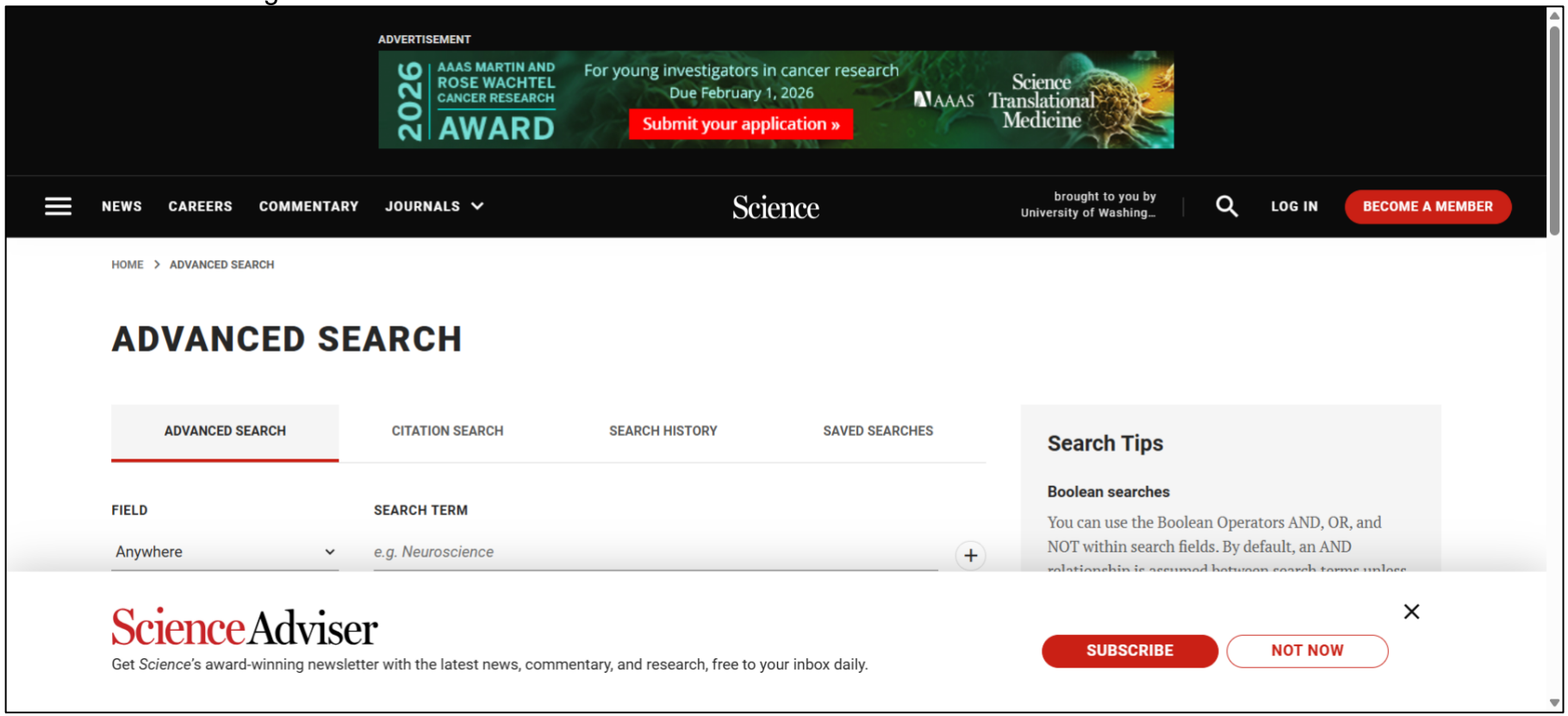

Figure 4. The Advanced Search page provides detailed search and filter options for finding research articles.

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Code Snippets

The following code examples illustrate critical WCAG success criteria violations and provide recommended fixes.

Missing Main Landmark Region (1.3.1, 2.4.1)

Current problematic implementation:

```
html
<div class="content-area">
  <div class="archive-results">
    <!-- Archive content here -->
  </div>
</div>
```

Recommended fix:

```
html
<main id="main-content">
  <div class="archive-results">
    <!-- Archive content here -->
  </div>
</main>
```

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Multiple Regions with Identical Labels (4.1.2)

Current problematic implementation:

html

```
<nav>
  <ul>
    <li><a href="/current-issue">Current Issue</a></li>
    <li><a href="/archive">Archive</a></li>
  </ul>
</nav>

<!-- Later in the page -->
<nav>
  <ul>
    <li><a href="/news">News</a></li>
    <li><a href="/careers">Careers</a></li>
  </ul>
</nav>

<!-- Footer -->
<nav>
  <ul>
    <li><a href="/about">About</a></li>
    <li><a href="/contact">Contact</a></li>
  </ul>
</nav>
```

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Recommended fix:

html

```
<nav aria-label="Journal navigation">
  <ul>
    <li><a href="/current-issue">Current Issue</a></li>
    <li><a href="/archive">Archive</a></li>
  </ul>
</nav>

<!-- Later in the page -->
<nav aria-label="Site navigation">
  <ul>
    <li><a href="/news">News</a></li>
    <li><a href="/careers">Careers</a></li>
  </ul>
</nav>

<!-- Footer -->
<nav aria-label="Footer navigation">
  <ul>
    <li><a href="/about">About</a></li>
    <li><a href="/contact">Contact</a></li>
  </ul>
</nav>
```

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Missing Alternative Text (1.1.1)

Current problematic implementation:

```
html
<img src="journal-cover-sept-2025.jpg" class="cover-image">
```

Recommended fix:

```
html
<img src="journal-cover-sept-2025.jpg"
    alt="Science journal cover, Volume 389 Issue 6767, September 25, 2025"
    class="cover-image">
```

Keyboard Trap in Accordion Controls (2.1.2)

Current problematic implementation:

```
html
<button onclick="toggleMenu()"
       id="journalsButton">Journals</button>
<div class="menu-content" id="journalsMenu">
  <a href="/science">Science</a>
  <a href="/science-advances">Science Advances</a>
  <a href="/science-immunology">Science Immunology</a>
</div>

<script>
function toggleMenu() {
  var menu = document.getElementById('journalsMenu');
```

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```
  menu.classList.toggle('visible');
}
</script>
```

Recommended fix:

html

```
<button onclick="toggleMenu(this)"
        aria-expanded="false"
        aria-controls="journalsMenu"
        id="journalsButton">Journals</button>
<div class="menu-content"
     id="journalsMenu"
     hidden>
  <a href="/science">Science</a>
  <a href="/science-advances">Science Advances</a>
  <a href="/science-immunology">Science Immunology</a>
  <button onclick="closeMenu()"
          class="close-menu"
          aria-label="Close journals menu">⨉</button>
</div>

<script>
function toggleMenu(button) {
  var menu = document.getElementById('journalsMenu');
  var isExpanded = button.getAttribute('aria-expanded') === 'true';
```

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```
  button.setAttribute('aria-expanded', !isExpanded);
  menu.hidden = isExpanded;

  if (!isExpanded) {
    // Focus first link when opening
    menu.querySelector('a').focus();
  }
}

function closeMenu() {
  var button = document.getElementById('journalsButton');
  var menu = document.getElementById('journalsMenu');

  button.setAttribute('aria-expanded', 'false');
  menu.hidden = true;
  button.focus();
}

// Allow Escape key to close menu
document.addEventListener('keydown', function(e) {
  if (e.key === 'Escape') {
    var menu = document.getElementById('journalsMenu');
    if (!menu.hidden) {
      closeMenu();
    }
  }
});
```

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```
</script>
```

Missing Status Messages for Search Results (4.1.3)

Current problematic implementation:

html

```
<div id="searchResults">
  <!-- Results update here via JavaScript -->
</div>

<script>
function displayResults(results) {
  document.getElementById('searchResults').innerHTML =
    results.map(r => createResultHTML(r)).join('');
}
</script>
```

Recommended fix:

html

```
<div id="searchResults" aria-live="polite" aria-atomic="false">
  <!-- Results update here via JavaScript -->
</div>

<div id="resultsStatus" role="status" aria-live="polite" class="sr-only">
</div>

<script>
```

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```
function displayResults(results, query) {
  // Update status message
  document.getElementById('resultsStatus').textContent =
    `Found ${results.length} results for "${query}"`;

  // Update results
  document.getElementById('searchResults').innerHTML =
    results.map(r => createResultHTML(r)).join('');
}
</script>
```

Context-Free Buttons (2.4.6)

Current problematic implementation:

html

```
<article>
  <h2>Scientists at odds over wild plans to slow melting glaciers</h2>
  <button class="add-to-list">Add to Reading List</button>
</article>

<article>
  <h2>Satellite mapping of red snow on North American glaciers</h2>
  <button class="add-to-list">Add to Reading List</button>
</article>
```

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Recommended fix:

```
html
<article aria-labelledby="article1-title">
  <h2 id="article1-title">Scientists at odds over wild plans to slow melting glaciers</h2>
  <button class="add-to-list"
          aria-label="Add 'Scientists at odds over wild plans to slow melting glaciers' to reading list">
    Add to Reading List
  </button>
</article>

<article aria-labelledby="article2-title">
  <h2 id="article2-title">Satellite mapping of red snow on North American glaciers</h2>
  <button class="add-to-list"
          aria-label="Add 'Satellite mapping of red snow on North American glaciers' to reading list">
    Add to Reading List
  </button>
</article>
```

Final Thoughts and Recommendations

The AAAS Science Archive platform in its current state presents significant accessibility barriers that make it largely unusable for people with disabilities, particularly screen reader users and keyboard-only users. The issues identified are not merely cosmetic but prevent access to core functionality of the platform, including searching for research articles, navigating journal archives, and accessing published scientific content.

Multiple critical accessibility issues were encountered throughout testing, including missing landmark regions, inadequate alternative text, keyboard traps, improper ARIA usage, inconsistent heading structures, and poorly implemented search functionality. These issues collectively create an experience that is frustrating at best and completely unusable at worst for users with disabilities.

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The platform shows evidence of attempted accessibility implementation, but many features are incomplete or incorrectly coded. This suggests that with focused remediation efforts, the platform could achieve substantially improved accessibility. The scientific research community depends on equitable access to published research, making accessibility improvements not just a compliance matter but an issue of scientific equity and inclusion.

Recommended Fixes

- **Implement proper landmark structure:** Add a main landmark region to all pages and provide unique, descriptive labels for all navigation and footer regions using aria-label attributes.
- **Add comprehensive alternative text:** Provide meaningful alternative text for all images, including journal covers, logos, graphics, and scientific illustrations. Ensure alt text describes the content and purpose of images, not just their filename or date.
- **Fix keyboard accessibility:** Eliminate keyboard traps by ensuring all expandable menus and accordions can be closed using standard keyboard navigation. Properly communicate the expanded/collapsed states and add visible close buttons where appropriate.
- **Correct ARIA implementation:** Ensure all interactive elements properly identify their role, state, and value. Fix buttons mislabeled as links, combo boxes that should be text fields, and tab panels that aren't announced.
- **Improve heading structure:** Use headings in proper hierarchical order (H1, then H2, then H3, etc.) without skipping levels. Ensure headings accurately describe the content they introduce.
- **Fix focus management:** Ensure focus remains in context after user interactions, particularly when applying search filters or pagination. When focus must move, provide clear indication of where it has moved and why.
- **Implement status messages:** Add aria-live regions to announce search results, filter applications, and other dynamic content changes to screen reader users.
- **Provide context for repetitive controls:** Add unique labels to "Add to Reading List" buttons and other repetitive controls so users understand which article each button references.
- **Address form accessibility:** Properly label all form controls, ensure radio button states are announced immediately upon selection, and fix improperly coded form elements.

The significant number and severity of issues suggest that a comprehensive accessibility remediation effort is required, potentially involving substantial redesign of certain interface components to ensure they meet accessibility standards and provide equitable access to all users.

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Disclaimer

Accessiblü prepared this report as a high-level accessibility evaluation of the AAAS Science Archive platform. The evaluation utilized industry-standard testing methodologies, including screen reader testing (JAWS 2025, NVDA), keyboard-only navigation, and manual inspection for select WCAG 2.2 AA success criteria.

This report does not represent a comprehensive WCAG compliance audit and should not be seen as a certification of accessibility compliance. While we have identified significant accessibility concerns and usability barriers, this evaluation was limited in scope and may not encompass all accessibility issues on the platform.

No Legal Liability:

Accessiblü offers this report for informational purposes only. It assumes no legal responsibility for accessibility violations or compliance failures resulting from its use. Organizations seeking formal certification should conduct a comprehensive audit and user testing with individuals with disabilities.

Limitations of Testing:

This evaluation was conducted at a specific time, and platform updates may have occurred after testing was completed. Additionally, while automated tools and expert reviews were utilized, real-world users with disabilities determine the true measure of accessibility.