FIMS CIE Review

30-minute briefing

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Independent peer review held April 21–23, 2026

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Why FIMS?

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What the review examined

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What remains before operations

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Implications for the Gulf SSC

01

Why FIMS?

The strategic problem FIMS is intended to solve

The current stock-assessment software landscape

Highly capable, but fragmented and difficult to sustain

Regional specialization

NOAA assessments rely on multiple regionally developed platforms with distinct architectures, terminology, and maintenance needs.

Maintenance vulnerability

Many tools depend on a small number of developers and older software infrastructure, creating continuity and succession risks.

Slow uptake of new methods

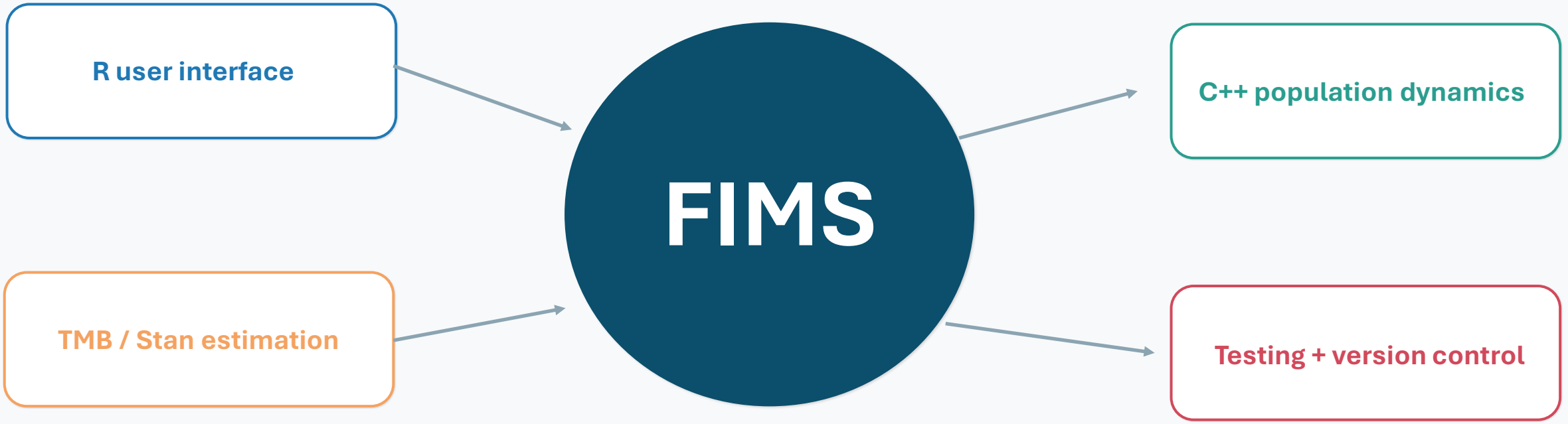
Rigid or bespoke code can delay incorporation of random effects, environmental drivers, and other emerging best practices.

FIMS is intended to shift the enterprise from many isolated platforms toward a shared, extensible ecosystem.

Sources: FIMS draft manuscript, pp. 2–5; CIE Executive Summary, pp. 1–2.

The FIMS vision

A nationally coordinated, modular framework that can evolve



Sources: CIE Performance Work Statement, pp. 1–2; Holmes report, p. 4.

Potential benefits

1	**Consistency**	Common terminology, diagnostics, workflows, and model summaries
2	**Efficiency**	Less duplicated maintenance and reduced reviewer effort
3	**Extensibility**	Clear pathways to add and test new scientific methods
4	**Transparency**	Open-source development, version control, and documented decisions
5	**Capacity**	A broader community rather than isolated single-developer platforms

Source: FIMS draft manuscript, abstract and introduction.

02

What did the review examine?

Scope, evidence, and standards used by the CIE panel

Independent review structure

April 21–23, 2026 • Virtual CIE panel

Panel

- Aaron Berger (Chair)
- Steven Holmes
- Daniel Howell
- Kotaro Ono

Evidence

- Developer presentations
- Case studies
- Simulation comparisons
- Code/testing materials
- Documentation and vignettes

Participation

- SSC representatives from all eight Councils
- FIMS development team
- Other NOAA scientists
- Interested participants and public

Source: Summary Report, pp. 4 and 15–18.

Five Terms of Reference

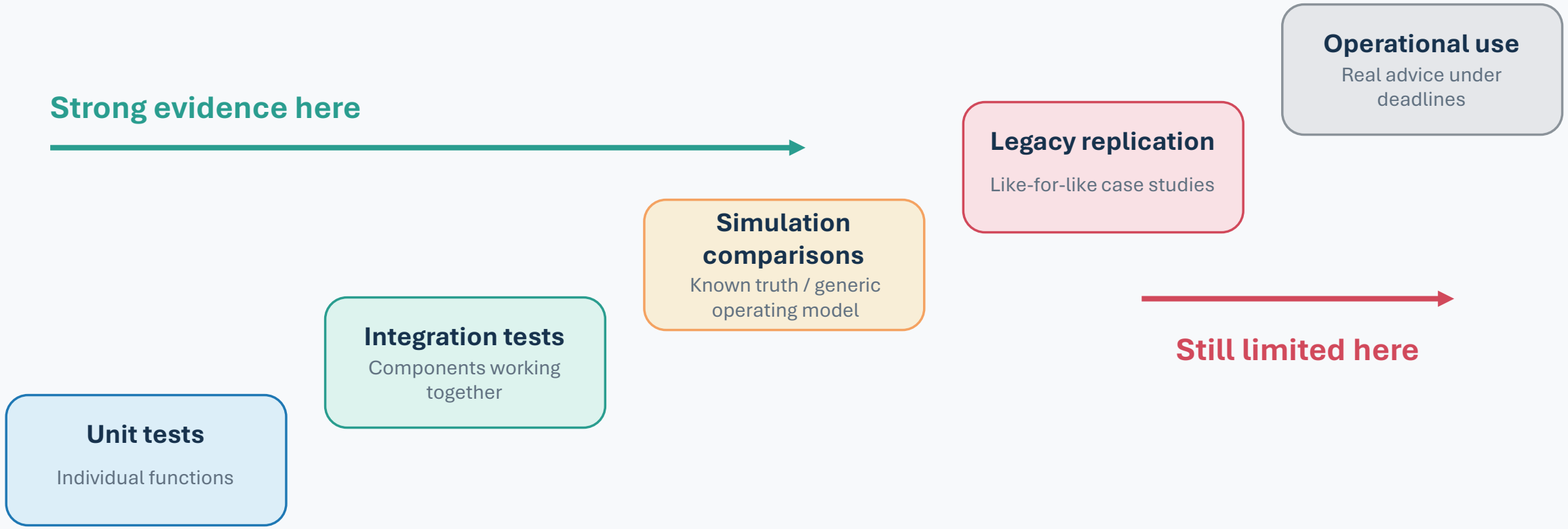
The review was broader than “does the model run?”

1	**Scientific and management framework**	Can FIMS model populations and support advice?
2	**Testing robustness**	Will automated tests help maintain reliability?
3	**End-to-end pipeline**	How well do data, modeling, diagnostics, and documentation fit together?
4	**Community development**	Can new developers add features responsibly?
5	**Future development**	What should be prioritized next?

Source: CIE Performance Work Statement, Annex 2.

How readiness was judged

Evidence progressed from code units to real assessment workflows



Sources: Summary Report, pp. 7–9; Holmes report, pp. 2 and 8–10.

03

What did the panel conclude?

A strong endorsement - paired with a clear readiness boundary

The headline conclusion

Promising and suitable for continued development—but not yet broadly operational

YES

FIMS is a suitable and highly promising framework with sound scientific foundations and modern development practices.

NOT YET

FIMS is not ready for routine operational use across all assessment types, regions, and management applications.

The distinction between “framework readiness” and “application readiness” is central.

Sources: Summary Report, pp. 5–6; Ono report, pp. 2–3; Howell report, p. 2.

What the panel viewed as strongest

The development process itself was a major accomplishment

Modern architecture

Modular design, R interface, C++ core, flexible estimation engines

Testing discipline

Automated tests and version-control practices described as leading in fisheries assessment

Collaborative governance

Broad engagement across Science Centers and open GitHub workflows

Case-driven development

Real assessment needs used to identify gaps and prioritize features

Bayesian–MLE flexibility

Potential to move between estimation paradigms within one framework

Sources: Summary Report, pp. 6–9; individual reviewer executive summaries.

Priority gaps before broad operational use

Structural, advisory, and user-facing needs

Model structure

- Seasonality
- Sex / sub-stock partitions
- Growth variability

Management advice

- Reference points
- Projection workflows
- Regional harvest-control rules

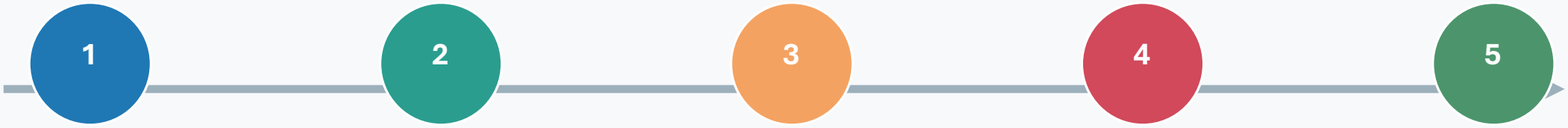
Diagnostics & usability

- Retrospectives
- Residual and convergence diagnostics
- Documentation and warnings

Sources: Summary Report, p. 5; Ono report, pp. 2–3; Holmes report, pp. 2–3.

Recommended transition strategy

Start with a small number of carefully selected assessments



1	2	3	4	5
Select	**Replicate**	**Stress-test**	**Review**	**Scale**
Relatively simple, well-understood stocks	Match legacy configuration and outputs	Diagnostics, retrospectives, uncertainty, workflow	Independent scrutiny under realistic timelines	Expand only after lessons are incorporated

Sources: Summary Report, p. 5; Howell report, pp. 2–4; Holmes report, pp. 3 and 5.

Testing: a major strength, but not sufficient by itself

Software correctness and assessment credibility are related—but distinct

Automated assurance

- Unit and integration tests
- Automated comparisons
- Continuous integration
- Version-controlled review
- Repeatable case studies

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Scientific assurance

- Biological plausibility
- Model diagnostics
- Sensitivity analysis
- Legacy-model replication
- Expert peer review

Sources: Summary Report, pp. 7–8; Holmes report, pp. 2 and 8–10; Howell report, pp. 5–7.

Preventing misuse

The review emphasized visible warnings and clearer documentation

Unavoidable convergence warnings

Non-converged results should be clearly flagged in tables and figures—not buried in console output.

Reference manual

Document equations, defaults, available options, parameter meanings, and consequences of choices.

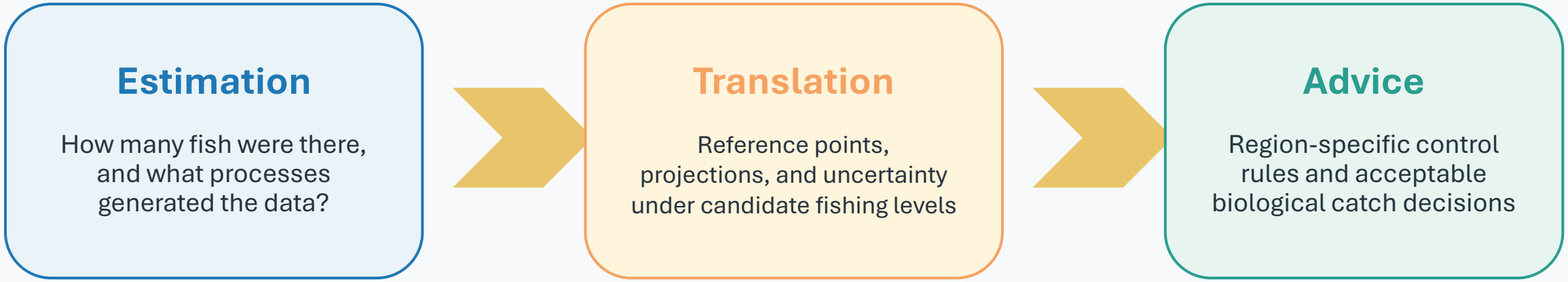
Model-building guidance

Reorganize vignettes around how to construct, diagnose, and use an appropriate assessment.

Sources: Ono report, pp. 2–3; Howell report, pp. 2–3; Holmes report, pp. 2–3.

Assessment is not the same as management advice

The remaining bridge is projections, reference points, and regional procedures



The review found the left side close for simple cases; the right side requires substantial regional coordination.

Sources: Howell report, p. 2; Ono report, pp. 2 and 6; Summary Report, pp. 5–6.

04

What does this mean for the Gulf SSC?

From passive awareness to structured regional engagement

A Gulf-specific readiness lens

The relevant question is not “Is FIMS ready?” but “Ready for which assessment?”

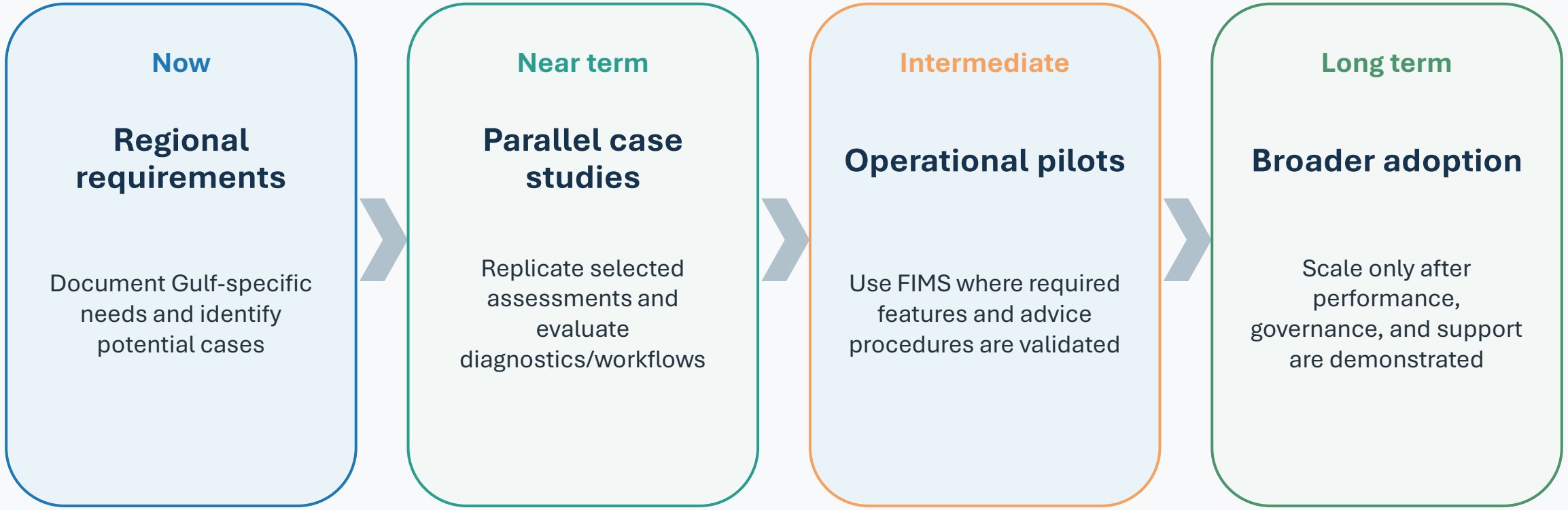
Data timing	Does the assessment require seasonal or within-year treatment of length/composition data?
Population structure	Are sex-specific, area-specific, fleet-specific, or sub-stock dynamics essential?
Advice conventions	Can FIMS reproduce Gulf reference points, projections, and ABC workflows?
Diagnostics	Are the diagnostics sufficient for SSC review expectations?
Operational constraints	Can the model be run, reviewed, and updated on the required schedule?

What role should the SSC play?

Regional scientific governance is part of operational readiness

Define minimum requirements	Identify Gulf-specific features, diagnostics, reference points, and projection conventions that must be supported.
Review candidate applications	Evaluate whether proposed early cases are scientifically and operationally appropriate.
Specify comparison standards	Agree on what constitutes acceptable replication of legacy models and adequate sensitivity testing.
Engage early on advice workflows	Help align FIMS projections and outputs with Gulf ABC and uncertainty procedures.
Track readiness transparently	Distinguish experimental, parallel, and operational uses in SSC records and recommendations.

A practical path forward



The panel explicitly favored robustness and long-term success over rapid replacement of legacy tools.

Source: Summary Report, p. 5.

Five take-home messages

1. FIMS is a strategically important and scientifically sound modernization effort.
2. The independent review strongly endorsed the direction and development practices.
3. FIMS is not yet ready for routine use across all assessment types and regions.
4. The best next step is a small number of deep, parallel applications to suitable stocks.
5. The Gulf SSC has an important role in defining regional requirements for diagnostics, projections, and advice.

Key source documents

- Review of Fisheries Integrated Modeling System — Summary Report (18 pp.)
- Daniel Howell — CIE Independent Peer Review (23 pp.)
- Kotaro Ono — CIE Independent Peer Review (26 pp.)
- Steven Holmes — CIE Independent Peer Review (27 pp.)
- CIE Performance Work Statement and Terms of Reference (8 pp.)
- FIMS development manuscript submitted to ICES Journal of Marine Science
- CIE FIMS Executive Summary and review materials