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# Importing the required library
import matplotlib.pyplot as plt

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# Background:
# This Gantt-style bar chart was designed to communicate the sequential
# structure of the 12-week research project.
# It visually maps the planning, execution, and data analysis phases of
# the study, including all three survey rounds.
# Each colored block represents a discrete segment of the timeline, and
# the legend identifies key milestones.
# This format helps clarify the chronological progression and overlap
# between recruitment, data collection, and analysis.
# -----

# Timeline segments (start week, duration, label, color)
phases = [
    (0, 1, 'Week 1: Recruitment', '#F5B800'),
    (1, 2, 'Weeks 2-3: Survey Design', '#F57200'),
    (3, 4, 'Weeks 3-7: Survey 1 - Heat Exposure', '#F34060'),
    (7, 3, 'Weeks 7-10: Survey 2 - Qualitative Follow-up', '#F565C2'),
    (10, 1, 'Weeks 10-11: Survey 3 - Fair Weather', '#3EC3F0'),
    (11, 1, 'Weeks 11-12: Data Analysis', '#12B9B4')
]

# Plot setup
fig, ax = plt.subplots(figsize=(12, 4))

# Draw bars
for start, duration, label, color in phases:
    ax.barh(0, duration, left=start, height=0.4, color=color,
            edgecolor='black')

# Axis formatting
ax.set_xlim(0, 12)
ax.set_ylim(-1, 1)
ax.set_yticks([])
ax.set_xlabel('Project Timeline (Weeks)')
ax.set_title('12-Week Research Timeline and Survey Phases')

# Create legend manually
legend_labels = [label for _, _, label, _ in phases]
legend_colors = [color for _, _, _, color in phases]
legend_patches = [plt.Rectangle((0, 0), 1, 1, color=color) for color in
                  legend_colors]
ax.legend(legend_patches, legend_labels, loc='lower center',
          bbox_to_anchor=(0.5, -0.55), ncol=2)

plt.tight_layout()
plt.show()

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